NeuRi
Student Congress
of Neuroscience

Book of Abstracts

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Rijeka – Rab
10 – 13 April 2025

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NeuRi 2025 Programme

Thursday, 10 April 2025 – Faculty of Medicine Rijeka

15:00 - 17:00	Registration
17:15 - 17:45	Opening ceremony
17:45 - 18:00	Official photoshoot
18:00 - 18:30	PLENARY LECTURE 1
	Igor Salopek, MD, specialist in psychiatry
18:30 - 19:00	PLENARY LECTURE 2
	Prof.dr.sc. Ingrid Škarpa-Prpić, MD, PhD
21:00	NeuRi - Pub quiz at STOP

Friday, 11 April 2025 – Faculty of Medicine Rijeka

10:00 - 11:00	Poster Session 1
11:00 - 11:10	Coffee Break
11:10 - 12:10	Poster Session 2
12:10 - 12:20	Coffee Break
12:20 - 13:20	Poster Session 3
13:20 - 13:30	Coffee Break
13:30 - 14:15	Poster Session 4
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	Domagoj Gajski, MD, Neurosurgeon
15:00 - 15:30	PLENARY LECTURE 4
	Dr. Ammar Al-Omari, PhD
15:30 - 16:30	Lunch
16:30 - 17:00	PLENARY LECTURE 5
	Josip Čičak, MD, Neurology Resident
17:00 - 17:30	PLENARY LECTURE 6
	Andrea Markovinović, PhD, mag.pharm.inv.
17:30 - 17:40	Coffee Break
17:40 - 18:30	Student Session 1 and 2

Saturday, 12 April 2025 – Insula County Hospital

6:30 - 09:45	Drive to Rab
09:45	Arriving at Insula
09:45 - 10:00	Welcome speech
10:00 - 10:30	PLENARY LECTURE 7
	Ivan Božić, MD, PhD
10:30 - 11:30	Student Session 3
11:30 - 12:45	Tour of the hospital
12:45 - 13:45	Lunch
13:45 - 16:30	Exploring the Island of Rab
16:45...	Drive to Rijeka
23:00	NeuRi Party @club

Sunday, 13 April 2025 – Faculty of Medicine Rijeka

8:30 - 9:30	Poster Session 5
9:30 - 10:20	Student session 4 and 5
10:20 - 10:30	Coffee Break
10:30 - 11:00	PLENARY LECTURE 8
	Prof. Vladimira Vuletić, MD, PhD, FEAN, FAAN
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11:30 - 12:30	Zdravi doručak
12:30 - 13:20	Student Session 6 / 7
13:20 - 13:30	Coffee break
13:30 - 14:00	PLENARY LECTURE 10
	Albert Haller, MD, neurosurgery resident
14:00 - 14:45	Workshops
14:45 - 15:30	Workshops
15:30 - 16:00	Closing ceremony

WELCOME NOTE

Dear colleagues,

It is my great honor to welcome you to NeuRi 2025 as the President of this year's congress. Organizing NeuRi for the first time has been both a challenge and a privilege, and I am incredibly proud of what we have accomplished.

Our team has worked tirelessly to prepare a program that blends cutting-edge neuroscience with hands-on learning opportunities. We hope to create an environment where you can not only expand your knowledge but also engage in meaningful discussions, exchange ideas, and, of course, have fun along the way.

A huge thank you goes to everyone who contributed to making this event possible—our organizing and scientific committees, our mentors and speakers, our sponsors, and most importantly, all of you who have joined us. Your passion and enthusiasm are what make NeuRi special.

I hope this congress inspires you, challenges you, and leaves you with new insights and friendships. Let's learn, explore, and enjoy every moment of NeuRi 2025!

On behalf of the Organizing and Scientific Board—

Welcome to NeuRi 2025!

Renata Miskrić
President of NeuRi 2025
Rijeka, April 2025

Thursday – April 10th
Plenary lecture 1

From NeuRi to Mobile Psychiatric Teams: Reminiscences, Challanges and Anti-Stigma

Igor Salopek, MD, specialist in psychiatry
General Hospital Karlovac, Karlovac, Croatia
Integrative Center for Mental Health, Karlovac, Croatia

Understanding student activism as a relevant and enriching complement to conventional educational content, this lecture will emphasize encouraging the audience to pursue professional and scientific advancements that will often lay the foundation for future career challenges. We will reflect on a series of student projects in the fields of neuroscience and mental health, which culminated in the establishment of the Student Congress of Neuroscience – NeuRi and the anti-stigma campaign "Stand by Me."

These efforts later took professional form through the Ministry of Health's pilot project "Launching Mobile Mental Health Teams in the Community" at General Hospital Karlovac, representing a specific and avant-garde model of community psychiatry. On the other hand, the Integrative Center for Mental Health was founded in Karlovac in 2017, serving as a platform for various programs, projects, campaigns, and activities aimed at promoting and protecting mental health and public health.

Plenary lecture 2

Let’s Talk About Epilepsy

Prof. Ingrid Škarpa-Prpić, MD, PhD
Department of Neurology, Clinical Hospital Centre Rijeka, Rijeka, Croatia

Epilepsy is one of the most common neurological disorders and, due to its characteristics, represents not only a serious medical and neurological issue, but increasingly a social and economic one as well. It is estimated that around 65 million people worldwide are currently living with some form of epilepsy. The causes and symptoms of the condition are highly diverse. Epilepsy is a chronic disorder of the central nervous system, specifically of the cerebral cortex, where certain brain cells become “hyperexcitable” and respond with synchronous discharges of electrical impulses. These abnormal discharges manifest as epileptic seizures. Epilepsy is not a single, uniform disease but rather encompasses a wide spectrum of symptoms caused by abnormal brain activity. It is the most common chronic neurological disorder and can occur at any point in life, although it most frequently appears during two life stages: infancy or early childhood, and after the age of 65. However, today epilepsy can be treated successfully in the vast majority of patients. Medication can lead to long-term remission, and some patients may eventually discontinue therapy altogether. The success of treatment depends heavily on early initiation, which is why timely recognition of epilepsy is crucial. Epilepsy has long carried a negative stigma and is rarely discussed openly, which makes it all the more important to raise awareness and speak about the condition.

Friday – April 11th
Poster Session 1

Late onset cerebral toxoplasmosis in a kidney transplant patient: a case report

Tomislava Tretinjak[1], Lara Uglik[1], Milutin Vukadinović[1,2], Vjenceslav Vrtarić[1,3]
[1] Faculty of Medicine Osijek, J. J. Strossmayer University Osijek, Osijek, Croatia;
[2] Department of Neurosurgery, University Hospital Center Osijek, Osijek, Croatia;
[3] Department of Neurosurgery, University Hospital Centre Sestre Milosrdnice, Zagreb, Croatia

Introduction
Toxoplasmosis is an illness caused by a protozoan parasite Toxoplasma gondii. In most individuals, it is considered a condition of subclinical symptomatology. In immunocompromised, latent infection can be reactivated, as well as transmitted via donated organ. For organ recipients, infection mostly occurs during the intense immunosuppressant therapy period, 3 months after the transplantation. Most common are neurological symptoms: headache, drowsiness, motor deficits and convulsions. Later, incidence rapidly decreases with 4-8% of infections appearing one year after the transplantation.

Case Report
Here, we report a patient who presented with cerebral toxoplasmosis 20 years after kidney transplantation. A 70-year-old kidney transplant patient complained of general weakness and loss of appetite with significant weight loss during the period of 6 months prior. The patient has been on immunosuppressive therapy for the last 20 years. At the time of admission, the patient’s physical examination showed signs of right-sided supranuclear facial palsy as well as right-sided limb weakness. Basic laboratory blood and urine tests weren’t indicative for a specific pathology. Next, a CT brain scan was performed and an expansive process in the left temporoparietal region was found. Based on MRI and a pattern of contrast imbibition, a malignant brain tumor was suspected. Thus, elective surgery was performed. Biopsy samples were taken for definitive diagnosis, and potential tumor was resected. There were no neurological deficits found during the post-operative examination of the patient. 21 days later, PHD reported Toxoplasma gondii bradyzoites encapsulated inside the examined brain tissue. Eventually, the definitive diagnosis of toxoplasmosis was made, and the patient started the treatment with pyrimethamine and sulfadiazine as drugs of choice.

Discussion/Conclusion

This case highlights the difficulties in late onset cerebral toxoplasmosis diagnostics in solid organ transplant patients, as well as how similar the two different pathologies present.

Keywords:
Brain abscess, brain pathology, cerebral toxoplasmosis, immunosuppression, neurosurgery

In the Blink of an Eye: Reversing Tumor-Induced Blindness Through Surgery

Matea Klaić[1], Petra Jelenić[1], Danijela Kegljević[1], Marija Kantolić[1], Ivan Bošnjak[2]

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[2] University Hospital Center Sestre Milosrdnice, Zagreb, Croatia

Introduction

Although primarily benign and slow-growing in nature, pituitary neoplasms can present with startling symptoms due to compression of nearby structures. While microadenomas (<1 cm) present with hypersecretion syndromes, macroadenomas (> 1cm) present with local mass effects: headache, subtle visual field defects, pituitary failure and/or hydrocephalus. Pituitary adenomas can also be classified based on their hematoxylin-eosin staining as acidophilic, basophilic, amphophilic, and chromophobic. Their incidence is up to 5 cases per 100, 000 people per year.

Case Report

A 63-year-old man with a history of hypogonadotropic hypogonadism and amblyopia presented with progressive narrowing and loss of temporal halves of his visual fields of both eyes. Compression of the optic chiasm and the left optic nerve was revealed through an ophthalmologic exam. This urged the use of magnetic resonance imaging which showed a pituitary macroadenoma. Furthermore, endocrine evaluation confirmed it was a nonfunctional macroadenoma. Given the visual impairment, the patient was immediately treated with an adenomectomy using a transsphenoidal endoscopic approach. The eroded floor of the sella turcica was exposed through the sphenoid sinus. After the opening of the sella turcica and incision of the dura, the tumor was completely removed using a cochlea and curettes. The anterior wall of the sella was reconstructed with autologous fat tissue harvested from the patient's right thigh. No complications occurred and the patient was given hydrocortisone to prevent adrenal insufficiency. Post-operative MRI showed no residual nor recurrent disease. The patients vision was fully recovered.

Discussion/Conclusion

This case highlights the impact of early surgical intervention regarding pituitary macroadenomas with the transsphenoidal approach providing a safe solution for visual restoration.

Keywords:

Hypogonadism, Optic Chiasm, Pituitary Neoplasms, Sella Turcica, Sphenoid Sinus

Trigeminal neuralgia caused by dolichoectatic vertebral artery: a case report

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[2] Department of Neurosurgery, University Hospital Center Osijek, Osijek, Croatia

Introduction

Trigeminal neuralgia (TN) is a chronic pain disorder characterized by intense facial pain that often disrupts everyday activities. The most common cause of TN is a blood vessel compressing the nerve near the brainstem due to its dolichoectatic nature: dilation and elongation caused by damage to the tunica intima. Such a vascular abnormality is more frequent in males, with an incidence of around 3% in the population. A common secondary cause or complication is neurovascular compression syndrome (NVCS).

Case Report

An 82-year-old female patient suffered from right-sided trigeminal neuralgia over the last two years. She underwent conservative treatment; several therapeutics were introduced but symptoms were refractory regardless of treatment. Mastication and speech were compromised due to facial pain. Symptoms were presented along the maxillary and mandibular branches of the right trigeminal nerve. Magnetic resonance imaging (MRI) and constructive interference in steady state mode (CISS) revealed a dolichoectatic vertebrobasilar artery with concomitant compression of the right trigeminal nerve by the ipsilateral VA. The patient underwent surgical treatment under general anesthesia, and a right-sided retromastoid craniotomy was performed. Microvascular decompression of the trigeminal nerve using Teflon was performed. The fifth nerve was decompressed in a 360-degree manner. Symptoms were completely resolved after surgery and the patient was discharged seven days later.

Discussion/Conclusion

Treatment of TN should be of a multidisciplinary approach since it affects both physical and mental health. On the other hand, if there is a secondary cause or complication of TN, such as NVCS, treatment is oftentimes difficult with limited options. Surgical treatment is the way forward in such cases.

Keywords:

craniotomy; MRI; trigeminal neuralgia; vertebral artery

Delayed subdural hematoma due to a relatively minor head injury

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Introduction
A subdural hematoma is a type of bleeding between the surface of the brain and the dura mater. It is classified as acute, subacute, or chronic, with the chronic form being more common in individuals older than 65, particularly those on anticoagulant therapy, with hypertension and diabetes mellitus. Symptoms may not appear for weeks. The clinical picture includes weakness in the extremities, headaches, and speech disorders. This case report emphasizes the importance of follow-up exams for patients after a mild head injury.

Case Report
A 66-year-old patient, involved in a car accident, sustained a blow of the head. A computed tomography (CT) scan of his brain displayed no abnormalities. A month later, the patient developed facial paralysis and dysarthria. The patient had been chronically using aspirin alongside a history of hypertension and diabetes mellitus. A follow-up CT scan of the patient´s brain revealed a 22mm wide chronic subdural hematoma with signs of acute exacerbation in the left front-parietal region, alongside a diffuse edema of the left cerebral hemisphere. Aspirin therapy was halted, and a burr hole trepanation was carried out. A control CT scan performed two days later did not show regression of the hematoma. Consequently, a decompressive craniotomy was performed, leading to gradual improvement in the patient's neurological status. A CT scan conducted four days later revealed a reduction in the hematoma.

Discussion/Conclusion
Hypertension, diabetes mellitus, aspirin usage and mild head trauma, contributed to the development of a chronic subdural hematoma. In some cases, people may not develop symptoms immediately after a head injury. This circumstance is called a lucid interval, with symptoms often developing days later, especially in the elderly or those with the mentioned risk factors. This underscores the importance of monitoring for neurological signs, even after a mild head injury.

Keywords:
Brain, Craniotomy, Dura Mater, Hematoma, Subdural

Microvascular decompression for treatment of trigeminal nerve neuralgia - surgical technique and case insights.

Maria Werner, Nikola Warzecha, Dr Waldemar Kołodziej (mentor)

Faculty of Medicine, University of Opole, Poland

University Clinical Hospital in Opole, Department of Neurosurgery

Introduction
Trigeminal neuralgia is defined as chronic, acute, burning, one-sided pain. Pain attacks can be triggered by even trivial activities, including chewing, speaking, gentle touch, or a breeze. This phenomenon is explained by central sensitization in response to peripheral nerve stimulation. The main pathological factor in trigeminal neuralgia is the demyelination of sensory axons caused by chronic pulsatile vascular compression of the trigeminal nerve root. Microvascular decompression (MVD) is a surgical procedure used to relieve abnormal compression of a cranial nerve causing trigeminal neuralgia, glossopharyngeal neuralgia, or hemifacial spasm.

MVD involves craniotomy, nerve decompression, and the insertion of a sponge between the nerve and the offending artery or vein triggering the pain signals. Medications often provide initial relief, but when drugs become ineffective or cause side effects, MVD is an option.

Case Report
A 76-year-old patient was diagnosed with right-sided trigeminal neuralgia and admitted to the Neurosurgery Department. The patient had been complaining of acute, one-sided pain in the area of the right mandibular nerve for 5 years. Pharmacological treatment was ineffective. Head MR imaging showed a minor right-sided arachnoid cyst in the posterior cranial fossa, and the patient was qualified for MVD surgery. During surgery, a conflict was found between the trunk of the V nerve and a branch of the superior cerebellar artery (SCA). The trunk of the V nerve was successfully dissected from the SCA branch and secured with hemostatic material to prevent recurrence of the conflict. Pain subsided after the surgery, and the patient was discharged in good neurological status.

Discussion/Conclusion
MVD is a good alternative for patients who have been struggling with long-term, acute facial pain that cannot be alleviated by any painkillers. The procedure is invasive but brings good results in relieving trigeminal nerve pain.

Keywords:
Microvascular decompression, trigeminal neuralgia, trigeminal nerve, craniotomy, neurosurgery

Consciousness Recovery Following Body Verticalization One Year After Severe Traumatic Brain Injury and Hydrocephalus

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Introduction
Severe traumatic brain injury (TBI) is a leading cause of morbidity, often associated with complex neurological and systemic complications. This case depicts the management of a patient with extensive cranial trauma, highlighting the surgical, rehabilitative and supportive care required in such cases.

Case Report
A 71-year-old male was admitted in June 2023 after sustaining a massive post-traumatic intracranial hemorrhage due to a fall into an empty swimming pool. Upon arrival at the hospital, he was somnolent but hemodynamically stable. Neuroimaging revealed bilateral subdural hematomas, subarachnoid hemorrhage (SAH), cerebellar hemorrhage, and laminar bleeding along the falx cerebri and tentorium with other associated injuries. An emergency right-sided decompressive frontotemporal (FTP) craniotomy and hematoma evacuation were performed immediately. Postoperatively, the patient lapsed into a deep coma (Glasgow Coma Scale 3). Seven days later, he developed hypertensive hydrocephalus as a complication, necessitating the placement of an external ventricular drain (EVD). Due to persistent hydrocephalus, a ventriculoperitoneal (VP) shunt was implanted in December 2023, followed by cranioplasty to restore cranial integrity. At discharge, the patient was in a state of minimal consciousness, exhibiting sleep-wake cycles and occasionally tracking objects with his eyes. One year after the initial injury, he remained in that state, developing muscle rigidity and spastic tetraparesis, with a limited motor response to painful stimuli and spontaneous movement in the right arm. Along with passive rehabilitation, they started to implement body verticalization after which the state of consciousness was recovered. The patient began to make purposeful movements, communicate, and was able to sign.

Discussion/Conclusion
This case aligns with previous reports, in whom the recovery of the state of consciousness followed verticalization of the body as part of physical therapy. This may be attributed to reduction in intracranial pressure (ICP), an increase in mean arterial pressure (MAP), and improved cerebral perfusion, supporting brain function and recovery.

Keywords:
Minimally conscious State; Orthostasis; Physical therapy; Traumatic brain Injuries; Ventriculoperitoneal shunt

Suprasellar meningioma with an extension to the right-sided optic nerve

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Introduction
Meningiomas are common intracranial tumors typically found in the frontal and occipital convexity, parasagittal region, or falx cerebri. While these locations are most frequent, suprasellar meningiomas are relatively rare. Due to their proximity to the optic apparatus, suprasellar meningiomas often present with visual disturbances, headaches, and, in some cases, endocrine dysfunction.

Case Report
A 51-year-old female patient presented with right-sided hemianopsia and was initially managed by an ophthalmologist. Her symptoms progressed moderately over a year. She underwent a magnetic resonance imaging scan of the brain, which revealed a suprasellar tumor with radiologic characteristics of meningioma with an extension to the right-sided optic canal. Given the tumor's location and associated symptoms, she underwent transcranial near-total surgical resection under general anesthesia. The procedure was uneventful, and histopathological analysis confirmed grade 2 meningioma. Postoperatively, the patient remained neurologically stable without new deficits. However, no significant improvement in her visual function was observed. A postoperative computed tomography scan showed gross total resection, with only a small remnant at the right optic canal. A follow-up MRI confirmed a small residual tumor at the same location. Given her stable condition, she was discharged on the eighth postoperative day with recommendations for follow-up.

Discussion/Conclusion
Suprasellar meningiomas are slow-growing tumors situated near the pituitary gland and optic nerves. They primarily affect middle-aged individuals and can cause significant visual impairment, particularly in those with prolonged compression, which may lead to optic nerve atrophy and, in severe cases, complete vision loss. Due to their anatomical location, these tumors present unique diagnostic and management challenges, necessitating prompt intervention to prevent serious complications.

Keywords:
Brain Neoplasms, Magnetic Resonance Imaging, Meningioma, Neurosurgery, Optic Nerve

Unraveling TRIOBP-1: insights into protein aggregation dynamics in chronic mental illnesses

Maja Juković, Beti Zaharija, Bobana Samardžija, Anja Hart & Nicholas J. Bradshaw
Faculty of Biotechnology and Drug Development, University of Rijeka, Croatia

Introduction
Chronic mental illnesses (CMI), including bipolar disorder, major depressive disorder and schizophrenia, are predominantly attributed to genetic factors. Our research proposes proteinopathies as an alternative approach to studying these illnesses. This study investigates the hypothesis that protein aggregation can be a cause of disrupted protein homeostasis. This research specifically focuses on the aggregation dynamics of Trio and F-actin binding protein, isoform 1 (TRIOBP-1), previously observed to aggregate in brains of CMI patients, and its possible co-aggregation partner Nuclear distribution factor 1 (NDE1), protein critical for neurodevelopment.

Materials and Methods
In this study, we transfected NDE1 protein and/or one of the various structural fragments of TRIOBP-1 into HEK293T cells, to assess their presence and abundance. Following this, we co-expressed both NDE1 with one of the TRIBOP-1 fragments in neuronal-like SH-SY5Y cells. We used immunocytochemistry to prepare the samples for fluorescence microscopy imaging and evaluation of the co-localization of NDE1 versus one of the TRIOBP-1 constructs.

Results
Our findings revealed NDE1 consistently co-aggregates with full-length TRIOBP-1, as well as a non-aggregating mutant lacking two aggregation-critical domains. Additionally, NDE1 co-aggregation was seen with two regions of TRIOBP-1: the central coiled-coil domain and the C-terminal coiled-coil domain. Surprisingly, while the C-terminal domain typically does not show aggregation propensity alone, its co-expression with NDE1 induced its aggregation.

Discussion/Conclusion
This study unexpectedly shows that NDE1 seems to drive TRIOBP-1 aggregation through its C-terminus, while TRIOBP-1 seems to promote the co-aggregation via its central region. Additional research on this topic is needed to validate these results, potentially using post mortem brain samples of CMI patients. The co-aggregation of NDE1 and TRIOBP-1 proteins could lead to cellular dysfunction that ultimately manifests as cognitive impairments, emotional instability, and other neuropsychiatric symptoms. By identifying specific TRIOBP-1 regions involved in this co-aggregation, we can contribute to the further understanding of the molecular mechanisms underlying CMI.

Keywords:
Depressive disorder, major; mental disorders; protein aggregation; protein homeostasis; schizophrenia

Challenges in managing fourth ventricle epidermoid cyst surgery performed in sitting position.

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University Clinical Hospital in Opole, Department of Neurosurgery

Introduction
An epidermoid cyst is a slowly growing, typically benign tumor that requires surgical treatment. It usually develops in the cerebellopontine angle or parasellar region and occasionally appears in the ventricular system. A significant and feared risk of the sitting position during surgery is the entry of air into the vascular system due to the negative intravascular pressure, which can lead to a potentially life-threatening air embolism and its consequences.

Case Report
A 51-year-old patient was admitted to the Neurosurgery Department with suspected neoplasms in the fourth ventricle, right cavernous sinus, and prevertebral region near the thyroid. The patient complained of non-specific symptoms, including balance disorders, fainting, double vision, and right-sided ptosis. Head MRI showed a massive, multicystic tumor in the posterior cranial fossa in the region of the fourth ventricle, which was exerting pressure on the pons and medulla oblongata. Surgery was performed in the sitting position. For optimal monitoring of the patient's condition, a Swan-Ganz catheter was used, allowing continuous assessment of hemodynamic parameters, including pulmonary artery pressure and cardiac output. Its use was essential for monitoring cerebral perfusion and for the early detection of potential complications, such as air embolism, which poses a significant risk in surgeries performed in the sitting position. The patient was discharged in good neurological condition. Histopathological examination confirmed the diagnosis of an epidermoid cyst.

Discussion/Conclusion
This case highlights the importance of precise surgical planning and close coordination between the neurosurgical and anesthesiological teams in the treatment of tumors of the posterior cranial fossa. Additionally, it demonstrates that despite the benign nature of epidermoid cysts, they can lead to severe neurological symptoms requiring complex surgical treatment.

Keywords:
Epidermoid cyst, sitting position, neurosurgery, Swan-Ganz, air embolism

Botulinum Toxin in the Rehabilitation of Post-Stroke Spasticity

Doris Barunčić[1], Barbara Hunjadi[1], Svetlana Tomić[1,2], Tihana Gilman Euric[1,2] (mentor)

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[2] Department of Neurology, Osijek University Hospital Centre, Osijek, Croatia

Introduction

Botulinum neurotoxin type A (BoNT/A), a potent bacterial toxin produced by Clostridium botulinum, is currently recommended as a first-line focal and reversible treatment for post-stroke spasticity by many international guidelines. Untreated spasticity greatly affects the quality of life (QoL) due to development of muscle contractures, spasm and pain thus disabling routine task performance including physical therapy, hygiene and self-care. So far the implementation of BoNT/A treatment for post-stroke patients in Croatia is suboptimal with very few data available on its recommendation frequency and therapy results.

Case Report

We present a case of a 68-year-old patient who suffered an extensive ischemic stroke five years ago, followed by unilateral hemiplegia. Despite continuous physical therapy his left arm remained without active movements in a fixed extended position with a "clenched" fist, making it impossible to perform physical therapy or maintain proper hand hygiene. The patient, initially scoring 4 on the Modified Ashworth Scale (MAS) for post-stroke spasticity showed exceptional improvement three weeks after receiving 200 IU of BoNT in the forearm and hand muscles. Measuring MAS 2-3 after the treatment, he is now able to independently raise his arm, actively flex and extend it at the elbow, also showing some movements in his hand. His QoL is now significantly improved since he can participate in physical therapy, maintain hand hygiene and even cooperate while dressing.

Discussion/Conclusion

Post-stroke BoNT/A treatment in Croatia should be much more advocated since it has a favourable safety profile in post-stroke spasticity, enables greater hand mobility, significantly contributes to the rehabilitation process and enhances the QoL of both the patient and their family.

Keywords:

Botulinum Toxins; Contracture; Muscle Spasticity; Rehabilitation; Stroke

Cascade of complications: a rare sequela of cerebrospinal fluid leakage after lumbar nerve root decompression

Alicja Szklarska, supervisor: Piotr Kamieniak MD, PhD

Student Scientific Society, Chair and Department of Neurosurgery and Pediatric Neurosurgery, Medical University of Lublin, Poland

Introduction

Discopathy affects 30-40% of individuals over the age of 40, typically manifesting as lumbosacral pain, radiculopathy, and sensory or motor deficits. Treatment options include conservative management or surgery. Nerve root decompression procedures are conducted frequently, however due to their complexity, there is a great prevalence of intraoperative complications, most commonly the liquorrhea, usually remaining the only symptom. Its management involves drainage and if inadequate, a direct dural suture.

Case Report

A 59-year-old male was referred to the Neurosurgery Department due to severe, persistent lower back pain secondary to lumbar discopathy, specifically right-sided lateral recess and foraminal stenosis at the L4/L5 level, as demonstrated by MRI. The procedures included right- sided L4/L5 fenestration and decompression of the nerve roots in the lateral recess and the intervertebral foramen. Two weeks postoperatively, the patient developed a bulge on his back. Despite no reported intraoperative complications, a dural tear leading to liquorrhea accumulating subcutaneously was suspected. Along with this symptom, headaches started to occur. MRI revealed a subdural hematoma above the right hemisphere, with a 5 mm midline shift. The patient could have been qualified for the hematoma decompression, but his headaches diminished. Follow-up CT showed a partial hematoma's regression. The patient underwent wound plasty with a dural substitute material followed by lumbar drainage. Subsequent CT showed a complete regression of the hematoma.

Discussion/Conclusion

Liquorrhea is a common complication of the nerve root decompression, nevertheless, the hypotonic syndrome that it causes usually does not affect the other parts of the CSF circulation system. In this case, its highly atypical presentation, a chronic subdural hematoma, determined the inversion of the typical order of procedures - firstly the wound plasty and then the lumbar drainage to decrease the risk of underpressure exacerbation, which resulted in the hematoma's regression and improvement of the patient's condition.

Keywords:

cerebrospinal fluid, decompression, neurosurgery, neurosurgical procedures, spinal cord

From Seizures to Developmental Milestones: Case Studies of GLUT1 Deficiency

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Introduction
GLUT1 deficiency is a rare genetic disorder caused by variants in the SLC2A1 gene, which encodes glucose transporter type 1, responsible for glucose uptake into neurons. This disorder reduces the availability of glucose in brain cells, impacting neurological development and potentially causing epileptic seizures, delayed psychomotor development, and cognitive impairment. Two cases with different clinical manifestations and genetic variants associated with GLUT1 deficiency are presented.

Case Report
A ten-month-old boy with a heterozygous variant (p. Val381GlyfsTer13) in the SLC2A1 gene was initially hospitalized for suspected cerebral seizures, which included left-hand twitching, rigidity, peripheral cyanosis, and bulbar rotation that lasted 6-7 seconds. The seizures recurred within 10 days of discharge. An EEG revealed possible slow dysrhythmia in the left FCT, whereas the brain MRI was normal. Levetiracetam was initiated, and the diagnosis of GLUT1 deficiency was confirmed through genetic testing and a low GUL/GUK ratio. Slowed psychomotor development and constipation were noted. The introduction of a ketogenic diet and the discontinuation of antiepileptic drugs led to normal development, weight gain, and improvements in psychomotor development.

A 6-year-old boy with a missense variant (c.523G>C; p. Gly175Arg) in the SLC2A1 gene was admitted for generalized epileptic status with tonic-clonic seizures. An EEG showed focal and generalized changes, prompting the introduction of valproate. Genetic analysis confirmed GLUT1 deficiency. Laboratory workups indicated marked ketosis, while amino acid levels were normal. Following the initiation of a ketogenic diet, the epileptic symptoms stabilized, and the boy continued to develop both motorically and cognitively, benefiting from speech therapy and occupational therapy exercises. The diet also improved his articulation difficulties.

Discussion/Conclusion
GLUT1 deficiency is primarily inherited in an autosomal dominant manner; however, around 90% of cases result from new gene variants. The ketogenic diet has been shown to enhance clinical outcomes by providing an alternative energy source for the brain.

Keywords:
Glucose Transporter Type 1; Ketogenic Diet; Monosaccharide Transport Proteins / deficiency; Seizure; SLC2A1

Women and alcohol use disorder – a case report

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Introduction
Dependence syndrome is caused by the action of addictive substances and is characterized by a change in behavior. Alcohol affects women differently than men, posing unique health risks even at lower levels of consumption. Women are more susceptible to alcohol-related harm and can impact mental health and contribute to issues such as anxiety and depression. Most of them start to drink more than planned and are unable to control alcohol consumption.

Case Report
A 45-year-old female patient was admitted to the Department of Emergency Psychiatry due to acute alcohol intoxication and aggressive behavior. Upon admission, her blood alcohol concentration was 2.33‰. Psychiatric evaluation revealed that she was conscious and cooperative. However, her mood was markedly depressed and agitated. Her family history was significant for alcohol dependence and early- life familial dysfunction. She concealed her alcohol-related problem from her child by hiding bottles behind books and primarily drank on weekends. The patient demonstrated a lack of insight into her addiction. She was prescribed escitalopram and diazepam, but she continued to experience significant emotional distress due to an impending divorce and the challenges of raising her child. This contributed to her persistently low mood. In December 2023, she was hospitalized again following another episode of acute alcohol intoxication, with a blood alcohol concentration of 3.33‰. A psychological evaluation identified projection as a primary defense mechanism, as she frequently blamed her ex-husband for her struggles. She was discharged in stable condition without signs of withdrawal syndrome and continued outpatient care. Recent assessments indicate maintained abstinence from alcohol, resolution of suicidal ideation, and improved affect regulation.

Discussion/Conclusion
This case highlights the complex relationship between alcohol dependence, psychiatric comorbidities, and significant psychosocial stressors. Despite initial denial of her addiction, the patient was in progress in maintaining abstinence and stabilizing her affective state through structured outpatient treatment and group therapy. However, her history of recurrent relapses, unresolved psychological defense mechanisms underscore the need for continued multidisciplinary support.

Keywords:
Alcoholism; Anxiety; Comorbidity; Rehabilitation; Recurrence

Early-Onset Alzheimer Disease Associated With a PSEN1 Mutation: A Diagnostic Challenge

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Introduction

Alzheimer's disease (AD) is characterized by dementia that typically begins with subtle and poorly recognized failure of memory (often called mild cognitive impairment or MCI) and slowly becomes more severe and, eventually, incapacitating. Most patients are diagnosed with AD after the age of 65, termed late-onset AD, while only 1% of the AD cases have an early onset, typically before the age of 65. Mutations in the PSEN1 gene, encoding presenilin-1 (PS1), are the most common cause of early onset AD.

Case Report

A 42-year-old female patient presented with hand tremors, MCI, and psychological symptoms, including restlessness and anxiety. Comprehensive neuropsychological assessment revealed average verbal intellectual functioning for her age, with below-average performance in arithmetic and numerical memory tasks. Given the presence of psychomotor symptoms, such as tremors and profuse palmar sweating, which significantly impaired daily functioning, further psychiatric and neurological evaluation was advised. Initially, a disorder of copper metabolism was considered as a potential cause of progressive cognitive decline; however, this was subsequently ruled out, along with Huntington's disease, spinocerebellar ataxia, thyroid dysfunction, vitamin deficiencies, and chronic central nervous system infections. Following the establishment of a working diagnosis of extrapyramidal syndrome, an extensive microbiological, radiological, and genetic work-up was conducted. Genetic analysis identified a mutation in the presenilin 1 (PSEN1) gene, consistent with the clinical presentation of early- onset cognitive impairment. Radiological imaging confirmed amyloid accumulation in the brain, while cerebrospinal fluid analysis demonstrated elevated Tau and phosphorylated Tau (pTau) protein levels, confirming the diagnosis of Alzheimer's disease.

Discussion/Conclusion

This case illustrates possible symptoms and the course of early-onset Alzheimer's disease, which usually points to an existing genetic background, but it also shows a very demanding differential diagnosis since, due to the patient's age, neurodegenerative diseases are not immediately taken into consideration.

Keywords:

Alzheimer Disease; Presenilin-1; tau-Proteins

NMDAR paraneoplastic autoimmune encephalitis as a presentation of adenocarcinoma of colon: A case report

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Introduction

Autoimmune encephalitis is a heterogenous group of disorders characterized by brain inflammation caused by an immune response to self-antigens expressed in the central nervous system. Etiology may be paraneoplastic and non-paraneoplastic. Patients present with symptoms such as memory loss, confusion, seizures, abnormal movements, psychiatric disturbances, and autonomic dysfunction. Diagnosis is based on clinical presentation, imaging, cerebrospinal fluid analysis, and specific autoantibodies. The most common type of autoimmune encephalitis anti-N-methyl-D-aspartate receptor (anti-NMDAR) encephalitis. Treatment includes intravenous steroids, plasma exchange and intravenous immunoglobulins.

Case Report

A 76-year-old male patient presented with gait instability and dizziness. Patient's wife noted disorientation in the last year. A multislice computed-tomography was ordered, no acute focal lesions were found with no significant findings upon further evaluation. Less than a month later, the patient presented to the emergency department with a three-day history of right-sided weakness, rendering him immobile without assistance. Additional symptoms include speech disturbances and difficulty urinating. Extensive diagnostics workup during hospitalization was unremarkable. Brain magnetic resonance imaging revealed punctiform T2/FLAIR hyperintensities in the frontal and periventricular parietal white matter, alongside mild global cerebral atrophy. Lumbar puncture confirmed the presence of anti-NMDAR antibodies, with cerebrospinal fluid analysis showing mononuclear pleocytosis with proteinorachie. Due to elevated oncomarker NSE, a positron emission tomography computed-tomography was performed identifying pathological uptake in the descending colon. Subsequent endoscopy and biopsy confirmed adenocarcinoma. Despite intensive care management, including intubation, immunomodulators, immunosuppressants, and antiepileptic therapy, the patient's condition progressively worsened due to the advanced malignancy and complications.

Discussion/Conclusion

This case highlights the importance of considering paraneoplastic symptoms, including autoimmune encephalitis, in patients with progressive neurological symptoms. Anti-NMDAR encephalitis, rare in the elderly population, can occur as a paraneoplastic phenomenon and may serve as an early clue to underlying malignancy. Early recognition and evaluation are key for timely diagnosis and treatment.

Keywords:

Adenocarcinoma; Anti-N-Methyl-D-Aspartate Receptor Encephalitis; Autoimmune diseases of the nervous system; Encephalitis; Paraneoplastic syndromes.

Poster Session 2

Centrifugal Force of Medications: A Case of Treatment-Resistant Depression with Psychotic Features

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Introduction
Depressive disorders with psychotic features present a significant challenge in clinical practice. Pharmacological management in these cases requires a tailored approach, often involving multiple adjustments to achieve clinical stability. The pharmacological treatment itself can sometimes induce new symptoms, contributing to a cyclical pattern of symptom exacerbation, which poses a challenge to effective management.

Case Report
A 37-year-old female, married with two children, has been undergoing pharmacotherapy for depression with psychotic features for over five years. Her therapeutic journey began with fluoxetine (2×20 mg), which was gradually discontinued due to insufficient response.

Following this, sertraline was introduced but also proved ineffective, prompting a switch to venlafaxine. The next step involved amitriptyline (2×25 mg), but it was discontinued after a lack of response. Due to the development of psychotic features, including delusional guilt and nihilistic thoughts, olanzapine (7.5 mg) was introduced, but it was discontinued due to excessive sedation.

After hospitalization for treatment adjustment, lurasidone (74 mg) was started, leading to significant clinical improvement. However, six months later, the patient developed hyperprolactinemia, accompanied by worsening depressive symptoms. After further evaluation, lurasidone was replaced with aripiprazole (10 mg), which resulted in gradual improvement of both the depressive and psychotic symptoms.

Discussion/Conclusion
This case highlights the complex nature of treatment-resistant depression with psychotic features, where medication adjustments are often necessary to manage evolving symptoms. The appearance of hyperprolactinemia in response to lurasidone underscores the importance of monitoring side effects in long-term pharmacotherapy. The transition to aripiprazole successfully addressed both depressive and psychotic symptoms, exemplifying the need for an individualized approach to treatment. Regular monitoring and therapeutic flexibility are essential to optimizing outcomes in this patient population.

Keywords:
Keywords: Depression, Hyperprolactinemia, Lurasidone, Pharmacotherapy, Psychosis.

Role of Auditory Steady State Response in a Patient with a Perplexing Presentation

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Introduction
Auditory Steady-State Response (ASSR) is an advanced electrophysiological testing method that estimates hearing thresholds by measuring auditory evoked potentials following acoustic stimuli, thus offering an objective assessment of a patient's hearing.

Case Report
We present a case of a 16-year-old female patient under regular neuropediatric surveillance due to being classified as high-neurorisk at birth. In December 2016, following an episode of otitis media, she presented with right-sided hearing loss, unsteadiness, nausea, and the subjective feeling of falling to the right. Clinical examination revealed bidirectional nystagmus, while Romberg and Unterberger tests indicated right-sided vestibular pathology. A diagnosis of right- sided toxic labyrinthitis was established, while pure-tone audiometry confirmed right-sided sensorineural hearing loss. Further examination at the Department of Pediatric Neurology revealed no apparent cause of deafness. Intravenous ceftriaxone and corticosteroids were administered, and she recovered within eight days of treatment. Two weeks later, the patient returned with complaints of right-sided hearing loss, this time without vestibular symptoms. Corticosteroids and hyperbaric oxygen therapy were prescribed. Only slight improvement was noted during the treatment, and the right-sided deafness was ultimately presumed permanent. However, she returned five days later, now claiming bilateral hearing loss. Given the inconsistencies between her clinical presentation and audiometric findings, ASSR testing was performed, revealing normal hearing thresholds in both ears. Follow-up audiometry confirmed bilateral normoacusia.

Discussion/Conclusion
Objective methods such as ASSR are essential when assessing patients unable or unwilling to cooperate with conventional audiometry. While ASSR is mainly used for testing very young children, it proved crucial in reaching the correct diagnosis in our adolescent patient. Discrepancies between the patient's audiograms and ASSR results raise the question of potential psychological factors motivating her hospital visits. In such cases, especially when treating pediatric patients, socio-economic and familial factors should always be considered, as such behaviour might hint at long-term emotional neglect or trauma.

Keywords:
Audiology; Audiometry; Evoked Potentials, Auditory; Hearing Loss, Unilateral; Neurology

From behavioural changes to life-threatening complications: A case report of opioid addiction

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Introduction
Opioid addiction significantly impacts both physical and mental health. It also affects social relationships, employment stability, and overall quality of life. The aim of this case presentation is to highlight how long-term opioid addiction leads to extreme personality and behavioural changes.

Case Report
A 42-year-old patient on methadone therapy visits the clinic for his regular treatment, reporting leg pain while appearing pale and weak. He denies substance use and refuses a medical examination. Laboratory test results reveal elevated inflammatory markers, leading to a referral to the emergency infectious disease clinic. However, he refuses further evaluation, claiming subjective symptom improvement. Two weeks later, his condition deteriorates. He is in poor general health, limping, experiencing weight loss and tremors, still refusing treatment. He admits selling his methadone due to financial difficulties. As his pain intensifies and walking becomes more difficult, he seeks emergency care one month after symptoms onset. Examination confirms an iliopsoas abscess, requiring urgent surgical intervention. The patient later confesses to injecting a methadone-Cedevita solution into his groin five weeks earlier. A fasciotomy is performed, draining 1000 ml of foul-smelling, thick pus. His medical history includes venous thrombosis due to heroin addiction and deep vein thrombosis (DVT) in 2023. He does not regularly attend psychiatric check-ups. Currently unemployed (laid off from a construction site three months ago), without income, living with a roommate, also an addict. He is estranged from his brother, whom he mentions as his only relative. He provided a psychiatrist's report; dosage remains the same, therapy is issued weekly.

Discussion/Conclusion
Opioid addiction is a chronic and relapsing disease, requiring lifelong treatment. Effective recovery demands comprehensive care, combining pharmacotherapy, psychotherapy, and emotional support to help patients maintain daily functionality. Long-term success depends on continuous medical and psychological support, allowing patients to integrate into society and lead a stable life.

Keywords:
Abscess, Fasciotomy, Heroin Dependence, Methadone, Venous Thrombosis

Complex clinical approach to cognitive impairment - case report

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Introduction
In this case, we present a patient diagnosed with rare overlap syndrome of systemic sclerosis(SSc) and ANCA-associated vasculitis (AAV) who begins to experience cognitive impairment. Impairment can result from direct vascular damage, inflammatory encephalopathy, systemic inflammation, and psychological factors. In addition, it is important to consider the possibility of coexisting Alzheimer's dementia, whose symptoms may be masked.

Case Report
A 70-year-old female patient with overlap syndrome of SSc and AAV presents with progressively worsening forgetfulness. Psychological testing revealed predominantly disorientation in time, deficits in verbal and visual memory abilities, reduced constructional skills, and diminished verbal fluency. The patient also exhibited depressive symptoms which can further compromise cognitive functions. Further evaluation revealed occlusion of the right internal carotid artery and a normal brain magnetic resonance imaging. The neurocognitive assessment revealed clear attention and episodic memory impairments, with a mini-mental state examination score 23.

Additionally, elevated levels of the Human polyomavirus 2 were found in urine with no viremia. Given that the patient is on immunosuppressive therapy, it is essential to regularly conduct necessary tests and adjust the treatment to avoid the development of progressive multifocal leukoencephalopathy, which can have overlapping neurocognitive symptoms.

Furthermore, immunosuppressive therapy on its own can contribute to cognitive impairment. It is important not to overlook the possibility of coexisting Alzheimer's disease, given the similarity of symptoms. For this reason, the patient will undergo further diagnostic processing, such as brain single-photon emission computed tomography and measurement of cognitive evoked potentials.

Discussion/Conclusion
This case illustrates how a clinical presentation can be explained by multiple differential diagnoses and their coexistence, highlighting the importance of a thorough diagnostic approach and problem-solving thinking to achieve the best possible patient outcome.

Keywords:
Alzheimer Disease; Cognitive Dysfunction; Dementia; Inflammation; Scleroderma,Systemic

Cerebral proliferative angiopathy

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Introduction

Cerebral proliferative angiopathy (CPA) is a rare vascular condition in the brain characterized by the gradual growth of an abnormal network or "mesh" of blood vessels. Unlike more aggressive malformations, CPA spreads in a diffuse manner, reducing the risk of severe bleeding but still causing symptoms such as headaches, seizures, or subtle neurological changes. CPA is exceptionally rare, with an incidence estimated at less than 1% of all brain vascular malformations, highlighting its uncommon nature.

Case Report

A 5-year-old male with normal psychomotor development presented with acute right hemiparesis and expressive aphasia lasting five hours. Magnetic resonance revealed extensive left frontal lobe cerebral proliferative angiopathy (CPA) with a small ischemic infarct. Digital Subtraction Angiography (DSA) showed anomalous vascularization of the left anterior and middle cerebral arteries, with visible contrast retention until the venous phase - no direct A-V shunts. Vascularization occupied almost the entire cranial part of the left frontal lobe (maximum diameter 9 mm). An external specialist confirmed the CPA diagnosis, excluding pial arteriovenous malformation (pAVM), and advised against active treatment. Discharged on levetiracetam and aspirin, he was readmitted a month later with similar symptoms but discharged without neurological deficits.

Discussion/Conclusion

Individuals with CPA may remain symptom-free for years. Treatment typically focuses on managing symptoms, involves medications for seizures and pain relief, and regular monitoring through imaging rather than surgical intervention, as the diffuse nature of CPA makes surgery challenging.

Keywords:

Cerebral proliferative angiopathy (CPA), diffuse vascular malformations, surgical challenges in CPA, antiepileptic drug

Applications and challenges of brain organoids in neuroscience and neurology

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Introduction

Traditional neuroscientific and neurological studies rely on animal models that only partially mimic human physiology. Brain organoids, three-dimensional in vitro models, replicate important aspects of human brain function and are a powerful tool for studying neurodevelopment, neurological diseases and potential therapies.

Materials and Methods

A systematic PubMed search was performed using the keywords "organoids", "human" and either "neuroscience" or "neurology" with a time filter of the last five years. Reviews, meta-analyses, unpublished studies, conference abstracts and studies on animals or animal-derived cells without translational potential were excluded. A total of 72 studies were analyzed, by 4 reviewers, for organoid application, methods, limitations, precursor cell types, and organoid models.

Literature Review

Brain organoids are mainly used to study neurodevelopmental and genetic disorders (18), embryology (16), neurophysiology (40), neurodegenerative (9), infectious and inflammatory (8) or other neurological disorders (5). Human induced pluripotent stem cells were used as a precursor cell in 47 studies, differentiated using growth factors such as Wnt agonists, Fibroblast Growth Factor 2, Noggin, Sonic Hedgehog and Notched signaling pathways and cultured in media supplemented with N2 or B27. Additional factors, such as taurine, can promote specialized differentiation, e.g. in retinal organoids. Human cortical organoids remain the most commonly used type, but organoids of the midbrain, spinal cord, blood-brain barrier, choroid plexus and glioblastoma can also be cultured. Despite their broad application, brain organoids have their limitations including insufficient vascularization, a lack of supporting cell types, and the inability to fully replicate the complexity of the human brain.

Discussion/Conclusion

Brain organoids are a valuable tool to improve our understanding of neurodevelopment and neuropathology by allowing us accurate observation of spatial and temporal changes in complex neuronal networks that mimic aspects of the human brain. However, there are limitations that require further optimization to improve physiological relevance and clinical applicability.

Keywords:

Human Induced Pluripotent Stem Cells, Neurodevelopmental disorders, Neurology, Neuroscience, Organoids

Autoimmune and Neurological Complexity: MS, Type 1 Diabetes and OCD

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Introduction

Multiple sclerosis (MS) is a chronic, immune mediated disease of the central nervous system. It is characterized by destruction of the myelin sheath surrounding the nerves and formation of areas of sclerosis. The autoimmune nature of MS predisposes the individual to develop other autoimmune disorders.

Case Report

The patient is an 18-year-old male who suffers from relapse remitting multiple sclerosis (RRMS), alongside diabetes type 1 and obsessive-compulsive disorder (OCD). Comorbidity of MS and psychiatric disorders has been documented, and some studies suggest that the prevalence of OCD is higher in patients suffering from MS. In 2021 (at 15 years of age) the patient presented to the neurology clinic after undergoing a magnetic resonance imaging (MRI) because of the OCD. T2 and FLAIR sequences, depicted classical multiple juxtacortical and subcortical hyperintense lesions, indicative of multiple sclerosis. These findings were incidental with no clinical manifestation, so no treatment was initiated, and the patient was only being monitored with annual MRI scans. By January of 2025, following MRI scans showed multiple new supratentorial lesions of the brain's white matter, yet no changes in the spinal cord. Now, the patient reports pronounced fatigue, tingling sensations in his arms and legs and occasional hand tremor. Further diagnostic testing confirmed the presence of oligoclonal bands (OCB) type 2, supporting the MS diagnosis. Until now he was treated with aripiprazole and clomipramine for his OCD, in addition to insulin and vitamin D. The following treatment plan includes cladribine, the purine antimetabolite used as the first or second – line treatment for RRMS.

Discussion/Conclusion

The patient's diagnosis of both MS and DM type 1 showcases his predisposition for autoimmune disorders with further possible connection between MS and OCD. The patient's worsening symptoms necessitate more aggressive treatment and further controls to maintain quality of life.

Keywords:

cladribine; diabetes mellitus, type 1; disorder, obsessive compulsive; magnetic resonance imaging; multiple sclerosis, relapsing remitting

Leptomeningeal carcinomatosis in a patient with uterine carcinoma: a Rare Case Report

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Introduction

Leptomeningeal carcinomatosis is a rare and severe metastatic condition marked by malignant infiltration of the pia and arachnoid mater. Although typically linked to breast and lung malignancies, its presence in uterine carcinoma is exceptionally uncommon, complicating diagnosis and treatment significantly.

Case Report

The patient is a 57- year old female with a history of metastatic cervical squamous cell carcinoma (FIGO IVa) presented with new- onset focal seizures characterized by right-sided facial and cervical cramps lasting approximately 3 minutes. During these episodes, she experienced transient aphasia and was unable to communicate. She has never experienced seizures before. Neurological examination revealed no focal deficits. Magnetic resonance imaging revealed diffuse leptomeningeal enhancement accompanied by signs of subarachnoid hemorrhage, indicating leptomeningeal carcinomatosis. Throughout her hospitalization, her mental state level deteriorated, necessitating a further computed tomography of the brain that indicated exacerbated subarachnoid hemorrhage and significant vasogenic edema. Electroencephalography video monitoring revealed severe cortical dysfunction, suggesting non- convulsive status epilepticus. We provided the patient with anti- edematous and anti seizure medications, specifically diazepam, levetiracetam and dexamethasone. Despite intensive supportive care, her condition persisted in deteriorating, and she ultimately succumbed to the disease within twelve days of admission.

Discussion/Conclusion

Leptomeningeal carcinomatosis is an uncommon yet lethal complication in individuals with systemic malignancies. The predominant solid tumors that metastasize to the leptomeninges are breast carcinoma, lung carcinoma, and melanoma. This case illustrates an exceptionally unusual occurrence of leptomeningeal carcinomatosis resulting from uterine carcinoma, a frequently overlooked and misdiagnosed condition. Due to the unfavorable prognosis and restricted therapy alternatives, prompt identification of neurological symptoms in patients with advanced gynecologic cancers is essential. Further research is necessary to improve the diagnostic and treatment approaches for this rare condition.

Keywords:

Meningeal Carcinomatosis; Neurologic Manifestations; Seizures; Subarachnoid Hemorrhage; Uterine Neoplasms

Acute Ischemic Stroke with Tandem Occlusion Treated with Mechanical Thrombectomy

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Introduction

Tandem occlusion involves blockages in both extracranial and intracranial arteries and leading to acute ischemic stroke due to the lack of blood supply. A 63-year-old male presented with acute left-sided hemiplegia, dysarthria, and gaze deviation. With a history of psychiatric treatment but no known chronic illnesses, he was transferred for advanced neurovascular care.

Case Report

On admission, his National Institutes of Health Stroke Scale (NIHSS) score was 17, with significant left-sided motor deficits. Computed tomography angiography (CTA) revealed tandem occlusions of both internal carotid arteries (ICA), the middle cerebral artery (MCA), left vertebral artery, and stenosis of the right vertebral artery. Mechanical thrombectomy achieved complete recanalization within two minutes, followed by ICA stenting. Post- procedure, the NIHSS improved to 14, and imaging confirmed evolving ischemia without hemorrhagic transformation. Dual antiplatelet therapy was started. The patient remained stable with left-sided neglect and hemiplegia. By hospital day four, the NIHSS improved to 11, with better speech and gaze control but persistent motor deficits. He was discharged on antihypertensives, statins, dual antiplatelet therapy, and psychiatric medications. Mechanical thrombectomy with stenting has shown favorable outcomes in selected cases. The decision between a stent-first or thrombectomy-first approach is based on the physician's judgment and the patient's clinical state. This patient's rapid revascularization and successful recanalization underscore the importance of timely intervention. Despite initial deficits, early rehabilitation and aggressive secondary prevention strategies are crucial for optimizing long-term recovery.

Discussion/Conclusion

This case highlights the importance of prompt neurovascular intervention in tandem occlusion strokes. The main complications of tandem occlusions and it' treatment include coma, infarction, lifelong disability and death. Despite initial severity, rapid thrombectomy and stenting facilitated significant recovery. Early rehabilitation and secondary prevention remain crucial in improving long-term outcomes. Further research is needed to refine treatment protocols and optimize functional recovery in similar cases.

Keywords:

Carotid Artery, Internal; Cerebral Revascularization; Infarction, Middle Cerebral Artery; Stroke; Thrombectomy

Unusual presentation of myotonic dystrophy type 1 in elderly patient

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Introduction

Myotonic dystrophy type 1 (DM1) is an autosomal dominant inherited disease from the group of muscular dystrophies. It is caused by the expanded CTG trinucleotide repeat in the myotonic dystrophy protein kinase (DMPK) gene and can manifest itself in three phenotypes: mild, congenital, and classic. Classic DM1 usually begins in adulthood, and the main symptoms include myotonia and distal muscle weakness.

Case Report

In March 2023, a patient was sent for a second opinion about focal dystonia to the Department of Neurology in the University Hospital Centre Osijek from Virovitica General Hospital. Since 2017 patient has been complaining of occasional "locking" of the tongue, throat, and jaw. It lasted 10-15 seconds and mostly happened after he had not spoken. The patient also suffered from glucose intolerance, elevated lipids, and prostate enlargement. Besides that, he had no other complaints or diseases. He was married, with no kids. Finished only elementary school and worked in physical jobs. In family history, his brother died in his early forties because of a heart attack. In neurological examination, besides delayed relaxation of the fingers after repetitive clenching of the hands and diminished reflexes on the arms and legs, he had otherwise normal neurological findings. Myotonic dystrophy was suspected, and the patient was sent for further evaluation. Brain MRI showed bilateral chronic vascular lesions. On electromyoneurography, myotonic discharges were recorded. Genetic testing confirmed DM1 disease. Follow-up examination reveals AV conduction abnormalities, diabetes mellitus, and cataract, and he received a pacemaker implant. Later, he started to complain of muscle weakness and myotonia in his arms and legs without new problems with speech.

Discussion/Conclusion

Our patient had an unusual clinical presentation of DM1 (no muscle weakness or myotonia in limbs reported by the patient but only in voice muscles) that could enable early recognition and diagnosis of this fatal disease.

Keywords:

Electromyography (EMG), Genetic Testing, Muscle weakness, Myotonic dystrophy 1, Myotonin-Protein Kinase

Rare Codon Differences in NDE1 and NDEL1 and Their Effect on Protein Expression

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Introduction
Nuclear Distribution Element 1 (NDE1) and Nuclear Distribution Element-Like 1 (NDEL1) are proteins that are vital in cell mitosis and neurodevelopment and have been associated with brain malformations and neurodevelopmental disorders, including schizophrenia and microcephaly. Despite their structural similarities, they have overlapping and distinct functions, potentially influenced by differences in codon usage. Rare codon bias is a tendency for some codons to be more frequently used than others in a specific species, while encoding the same amino acid. We explored how codon bias affects protein expression, focusing on the NDEL1's higher rare codon frequency compared to NDE1, which may contribute to variations in their expression and function.

Materials and Methods
We compared the codon frequency of both genes in various vertebrate species to investigate whether the codon usage differences between NDE1 and NDEL1 are conserved. Synthetic versions of these genes were then generated to replicate the codon usage of the other. Constructs containing wild-type and codon-mimicking versions of both genes were transfected into HEK293T cells, and protein expression levels were subsequently assessed by Western blot.

Results
We observed that the rare codon preference in NDEL1 seen in humans was also present in non-human primates and mammals, suggesting this bias is conserved across mammalian species. Wild-type NDE1 showed higher protein expression compared to NDEL1. However, when codon usage was switched between the two genes, the expression levels of the two proteins converged, indicating that their codon bias influences their protein expression.

Discussion/Conclusion
Our findings suggest that rare codon bias may contribute to different expression levels and function of NDE1 and NDEL1. The conservation of this bias across mammalian species highlights its evolutionary significance. Furthermore, modulating protein expression altering codon usage may provide insights into molecular mechanisms underlying neurodevelopmental disorders associated with these proteins. Future research could explore therapeutic applications based on codon optimization strategies.

Keywords:
Codon Usage, Gene Expression Regulation, Mental Disorders, Neurodevelopmental Disorders, Protein Expression

Atypical antipsychotics and metabolic syndrome- possibility of prevention

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Introduction
Metformin is a first-line therapy for the treatment of type 2 diabetes, due to its robust glucose-lowering effects, well-established safety profile, and relatively low cost. Recent advances revealed that this drug, in addition to its glucose-lowering action, might be promising for specifically targeting metabolic differences between normal and abnormal metabolic signalling. It has shown highly promising results in the treatment of metabolic syndrome.

Case Report
Patient V.M.M., born in 1971, is a retired, divorced mother of three, residing in Zagreb. She has had schizophrenia since 24, experiencing paranoid delusions of being followed and threatened, along with auditory hallucinations of a male voice. She was treated with various 1st and 2nd generation antipsychotics which resolved her psychotic symptoms. The most effective therapeutic response was achieved with Olanzapine 15 mg, although she gained 26 kg after two years of therapy, reaching 103 kg (BMI 40.2) from an initial weight of 77 kg, height 160 cm (BMI 30.1). She was then switched to the long-acting antipsychotic Paliperidone 150 mg i.m. every 4 weeks. Due to the suspicion of the development of metabolic syndrome, metformin 1000 mg 3x1 was introduced. After 12 months, the patient lost 19 kg, bringing her weight to 84 kg (BMI 32.8) and metabolic parameters returned to normal levels. After treatment with metformin, her improved mental state remained unchanged, indicating no effect on psychotic symptoms.

Discussion/Conclusion
This case highlights the potential of metformin beyond its traditional role in type 2 diabetes management. In a patient with antipsychotic-induced metabolic syndrome, metformin therapy led to significant weight loss and normalization of metabolic parameters. Although not a treatment for schizophrenia, metformin may be used off-label to reduce metabolic syndrome risk, encouraging patients who fear metabolic side effects to take antipsychotics regularly.

Keywords:
Atypical antipsychotics, metabolic syndrome, metformin, schizophrenia, weight gain

Poster Session 3

Shadows of the Mind: Challenges in Treating Severe Depression with Repeated Suicide Attempts

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Introduction
Depression and borderline personality disorder often coexist, significantly increasing the risk of suicidal behavior. Depression is characterized by anhedonia, sadness, and cognitive disturbances. In contrast, borderline personality disorder involves impulsivity, emotional instability, and difficulties in emotional regulation. This combination of symptoms requires a specific and comprehensive approach to treatment, especially in adolescents.

Case Report
An 18-year-old female patient was admitted to emergency services following her fifth suicide attempt. She tried to hang herself at home. The patient has a history of depression, global dysfunction, and self-harm, including cutting. She had been prescribed olanzapine and alprazolam. However, there has been non-compliance with treatment. During previous hospitalizations, she often hid or discarded her pills and repeatedly stopped taking medication on her own. In the past year, she has suffered from severe visual hallucinations, seeing shadowy figures, and auditory hallucinations where a male voice criticizes her and encourages self-harm and harm to others. This voice even instructed her to hang herself, but its source remains unknown to her. After several consecutive hospitalizations, she started group therapy at a psychiatric day hospital. Due to severe social anxiety, she was transferred to exclusively individual psychotherapy, which she still regularly attends. This change improved her psychological well-being. She increasingly started engaging in therapeutic activities and showed better compliance with her medication. Her treatment plan was revised entirely, and she is currently on a new regimen, including clozapine 25 mg, alprazolam 0.5 mg, lurasidone 37 mg, and lamotrigine 50 mg.

Discussion/Conclusion
This case highlights the need for a dynamic and individualized approach to treating co- occurring depression and borderline personality disorder in teenagers. The unique challenges of this patient show that pharmacological and psychotherapeutic treatment strategies must adapt to the changing psychological state to ensure ongoing engagement and long-term stability.

Keywords:
Borderline Personality Disorder; Depression; Hallucinations; Self-Injurious Behavior; Suicide, Attempted

When New Therapies in Rheumatology Meet Neurology

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Introduction
Rheumatoid arthritis (RA) is a chronic autoimmune disease that primarily affects the joints but can also cause systemic complications. Biological therapies, such as baricitinib, are effective in controlling RA but increase the risk of infections due to immunosuppression. Herpes zoster is a common opportunistic infection in RA patients and in rare cases, can lead to severe neurological complications such as radiculopathy and meningoencephalitis. This case explores the development of complex neurological symptoms in an RA patient following herpes zoster infection.

Case Report
A 68-year-old male with seropositive RA and osteoporosis, on long-term baricitinib therapy, developed herpes zoster in the thoracolumbar region. Initially treated with antiviral therapy, he later experienced weakness and numbness in the lower limbs, with significant loss of strength in his right leg. Afterwards, headache, confusion and transitory speech impairment developed.

Lumbar puncture and imaging, pointed to post infectious meningoencephalitis and L5-S1 radiculopathy. This raised concerns about the potential link between biological therapy, immunosuppression, and viral reactivation.

Treatment involved stopping baricitinib temporarily, administering acyclovir, corticosteroids, and initiating intensive physical rehabilitation. Control neuroimaging revealed resolving signs of meningoencephalitis. Physical therapy led to significant motor function recovery, although some neurological deficits remained at discharge.

Conclusion
This case highlights the challenges of managing RA patients on biological therapy when rare complications arise. In case of recurrent and insidious neurologic signs in these patients, it is important to consider central nervous system inflammatory disease. A multidisciplinary approach involving neurologists, rheumatologists, and infectious disease specialists was essential for optimizing outcomes and emphasizes the importance of monitoring for complications in immunosuppressed patients.

Keywords:
baricitinib, biological therapy, herpes zoster, meningoencephalitis, rheumatoid arthritis

The AI Final Frontier: Neural Networks and the New Era of Neurology

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Introduction
Neural networks are significantly advancing the field of neurology through improved diagnostics, treatment strategies, and patient outcomes. This review analyzes neural network architectures, exploring their potential to manage complex neurological data, advancing diagnostics, and offering new opportunities for improved neurological healthcare.

Materials and Methods
PubMed was searched using the keywords "neurology," "neuroscience," "neuroimaging," "MRI," "fMRI," "EEG," "PET," "CT," "neurological disease," "diagnosis," "prognosis," "early detection," "classification," "segmentation," "deep learning," "convolutional neural networks," "transformers," and "recurrent neural networks." Full-text, original studies published within the last 5 years were included. A total of 178 studies were retrieved and screened for methods related to neural networks in diagnosing and classifying neurological diseases.

Literature Review
After analyzing 178 studies on neural network applications in neurology, we identified 62 distinct architectures, categorized into nine functional groups based on their primary applications and data types. Convolutional Networks dominated, appearing in 101 studies (57%), primarily for Alzheimer's and Parkinson's diseases using magnetic resonance imaging and structural magnetic resonance imaging data. Feedforward Networks (10%) focused on structured clinical data, while Recurrent Networks (6%) were used for temporal data analysis, such as electroencephalogram data, in epilepsy and stroke. Generative Models (7%) contributed to brain tumor detection and neurodegenerative diseases by generating synthetic data. Hybrid Architectures (9%) enabled multi-modal data integration, particularly in multiple sclerosis diagnosis.

Discussion/Conclusion
These findings highlight the diverse applications of neural networks in neurology. CNNs dominate image-based pathologies, while Feedforward and Recurrent Networks enhance clinical and temporal data analysis. Generative Models augment datasets, and Hybrid Architectures integrate multi-modal data for complex conditions like Multiple Sclerosis. However, challenges such as generalizability and data bias must be addressed to realize neural networks' full potential, transforming neurology and enhancing diagnosis and treatment.

Keywords:
Artificial Intelligence, Disease Classification, Diagnostics, Neurology, Neural Networks

Late-Onset Bipolar Affective Disorder with Comorbid Post-Traumatic Stress Disorder

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Introduction
Post-Traumatic Stress Disorder (PTSD) is a mental health condition triggered by trauma, leading to symptoms like flashbacks, nightmares, and anxiety. Bipolar Affective Disorder (BAD) is marked by extreme mood swings, including manic and depressive episodes. Understanding the interplay between late-onset BAD and PTSD is crucial for effective treatment and better patient outcomes.

Case Report
A 50-year-old military veteran with a history of PTSD presents to the Clinic for Psychiatry Rijeka because his mental state has worsened. Before hospitalization, he reported work-related stress, apathy, social withdrawal, and poor appetite, arriving at the clinic in t-shirt and shorts in winter. During hospitalization, he displayed a demanding, intrusive demeanor with an irritable and dysphoric mood. He lacked insight into his condition, characteristic of a manic state that followed a recent depressive episode, suggesting a diagnosis of bipolar affective disorder (BAP). For stabilization of his mental state he was referred to treatment in the span of 3 months at Special County Hospital Insula Rab. The patient was treated with combined psychopharmacotherapy and group therapy. His mental state has significantly improved after treatment.

Discussion/Conclusion
Bipolar Affective Disorder (BAD) typically results from the interaction of biological, social, and psychological factors. Stressful life events, such as work stress and PTSD, often precede the onset and recurrence of BAD episodes. Long-term treatment with combined psychopharmacotherapy and group therapy has proven effective in treating BAD with comorbid PTSD.

Keywords:
Affective Psychosis, Bipolar Disorders, Bipolar Neuroses, Manic Depression, PTSD

Spirituality in oncology patient with comorbid mental illness

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Introduction
Spirituality in oncology patients can be defined as the ability of a rational being to sustain the will to live despite life's hardships and the awareness of death. Highly expressed religiosity, as part of spirituality, can positively influence the course of treatment and quality of life in oncology patients with comorbid mental illness.

Case Report
Lj.M., born in 1960, was diagnosed with left breast cancer in 2013, followed by surgery and chemotherapy. In 2019, she was diagnosed with right breast cancer and received surgery and radiotherapy. In 2014, she experienced headaches, dizziness, nausea, vision problems, and vertigo. A brain CT scan revealed an AV malformation. Despite high risks, she initially refused surgery but later underwent it in 2024. Psychiatric treatment for anxiety and depressive symptoms began in 2016, and she was placed on antidepressants, anxiolytics, and hypnotics. Throughout her demanding oncology and psychiatric treatment, her religiosity became more prominent. Though not part of a conventional religious structure, she prays Catholic prayers and attends church weekly, identifying as an Orthodox Christian. Her faith in God and universal goodness reflects her capacity for transcendence and connection to a higher power. As time goes by, it becomes evident that with the increase in her religiosity, her mental state also stabilizes.

Discussion/Conclusion
From conversations with the patient, it is evident that religious rituals, such as daily prayer help her overcome her illness and maintain inner peace during the most challenging times. Without frequent prayer and communication with God, she believes her recovery would not have been possible. When life presents her with a new obstacle, she reaches for something greater than herself and finds meaning in everything. This case illustrates how spirituality positively impacts the quality of life for patients with malignant diseases and comorbid mental illness.

Keywords:
Mental illness, Neoplasm, Quality of life, Religion, Spirituality.

A Case of Symptomatic Carotid Stenosis and Ipsilateral Carotid Body Tumor

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Introduction
Carotid body tumors, also known as glomus caroticum tumors, are rare, highly vascular, and typically benign neoplasms originating from the chemoreceptive cells of the carotid body. Located at the bifurcation of the common carotid artery, these tumors account for fewer than 0.5% of all body tumors and approximately 65% of head and neck paragangliomas.

Case Report
A 74-year-old man was admitted with a clinical presentation of an anterior circulation ischemic stroke with mild motor paraphasia and mild right-sided hemiparesis. Neuroradiological examination revealed a left frontoparietal ischemic lesion and a high-grade stenosis of the internal carotid artery on the left. At the same time, an oval expansive formation was visualized in the area of the left carotid bifurcation, which most likely corresponds to a glomus tumor.

Considering the satisfactory neurological status of the patient, National Institutes of Health Stroke Scale (NIHSS) score of 3, the patient was transferred to Vascular Surgery after consultation with the surgeon. On the seventh day after the brain infarction, an endarterectomy of the bifurcation of the left internal and common carotid artery was performed, followed by an excision of the glomus tumor. The patient then spent 24 hours in the Intensive Care Unit, where he was monitored and neurologically stable. The drain was removed after 24 hours. He was discharged one week after the operation, and neurological and neurosonological monitoring continued for the next 12 months and his neurological deficits improved significantly.

Discussion/Conclusion
This case report presents the successful surgical management of a patient diagnosed with both a glomus caroticum tumor and significant carotid stenosis. The rare concurrent occurrence of these two conditions presents a unique clinical challenge due to the complex anatomical connections and the risk for significant perioperative complications. Surgical intervention requires thorough preoperative preparation, precise technique, and a multidisciplinary approach to ensure optimal patient outcomes.

Keywords:
Brain Infarction; Carotid Body Tumor; Carotid Stenosis; Endarterectomy; Paraganglioma

Immunopathological and clinical profile of autoimmune encephalitis

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Introduction

The aim of this case report is to present autoimmune encephalitis, a rare but serious clinical condition in which the immune system attacks the brain, causing inflammation and neurological symptoms.

Case Report

A 16-year-old adolescent, who had been under multidisciplinary monitoring for chronic depression with psychotic features, ataxic gait, and spastic paraparesis of the lower limbs, was admitted to the Neurology department for further evaluation. During the investigation of these symptoms, elevated serum levels of glutamic acid decarboxylase (anti-GAD) antibodies were found. Physical examination revealed slight head tilt to the right, hypotonia of the upper limbs and the hypertonia of the lower limbs. In the forward bend, right convex scoliosis of the thoracic segment was observed, along with pronounced asymmetry of the shoulders and scapulae. Laboratory results revealed normochromic normocytic anemia, hypoproteinemia due to hypoglobulinemia, and folic acid deficiency. Immunological testing revealed positive anti- GAD, ANA, and anti-DGP-IgG antibodies, with borderline positive antiganglioside antibodies for GM1. After performing a lumbar puncture, the cytological, biochemical, and microbiological analysis of the cerebrospinal fluid was normal. Serology for neurotropic pathogens indicated a recent infection with Chlamydophila and Parvovirus B19. She was also examined by an ophthalmologist due to indistinctly limited optic disc of the optic nerve bilaterally. Ultrasonography of both eyes showed optic disc prominence. Following the discovery of elevated anti-GAD antibody serum levels, parenteral immunoglobulin therapy was initiated, along with premedication with intravenous methylprednisolone.

Discussion/Conclusion

Autoimmune encephalitis is a clinical condition that requires early diagnosis and prompt initiation of treatment in order to reduce neurological complications and improve the quality of life of the affected individuals.

Keywords:

Antibodies, GAD; Autoimmune Encephalitis; Immunoglobulins; Methylprednisolone; Paraparesis

Variability of inflammatory response in experimental subarachnoid hemorrhage

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Introduction

Subarachnoid hemorrhage (SAH) is a type of stroke. The initial 72 hours after the onset, termed “Early Brain Injury” (EBI), involve complex pathophysiological processes such as blood-brain- barrier breakdown, cerebral edema, oxidative stress, and cell death. Neuroinflammation is proposed to be cross-linking factor between mentioned components of EBI. Cytokines orchestrate cellular communication, they are released from both immune and non-immune cells. Due to the pleiotropy of cytokines, they may exhibit pro-inflammatory, anti-inflammatory, neuroprotective or neurotrophic functions. Understanding the cytokine network holds promise as a tool for prognosis and therapy. This research investigates the variability of the cytokine expression based on the severity of bleeding.

Materials and Methods

Subarachnoid hemorrhage (SAH) was induced in male Sprague-Dawley rats using the endovascular perforation model. After 4 hours, animals were euthanized, the hemorrhage severity was graded (moderate: 6-12, 8 animals; severe: 13-18, 5 animals), and the brain tissue adjacent to the hemorrhage site was collected. RNA isolation was performed using the RNeasy Mini Kit. Gene expression of TNF-α, IL-1β, and IL-6 family cytokines (IL-6, IL-11, CLCF-1, LIF, OSM, CNTF, CTF-1) was measured by qPCR. Group differences were analyzed using one-way ANOVA followed by Tukey’s post-hoc test.

Results

Severe SAH is associated with significantly higher expression of TNF-α ($p < 0.0001$, 6.76- fold), IL-1β ($p < 0.0001$, 13.34-fold), IL-6 ($p < 0.0001$, 5.13-fold), IL-11 ($p < 0.001$), CLCF-1 ($p < 0.01$), LIF ($p < 0.0001$), and OSM ($p < 0.0001$) compared to moderate SAH. No significant changes were observed for CNTF, CTF-1.

Discussion/Conclusion

SAH-related pathophysiological processes are connected through neuroinflammation. Variability of inflammatory response has been shown to be dependent on severity of the bleeding. More severe SAH triggers a stronger inflammatory response, likely due to greater hematoma mass and increased breakdown of blood components. This work was supported by the grant of the Ministry of Health of the Czech Republic No. NU23-04-00382.

Keywords:

Early Brain Injury; Inflammation; Stroke; Subarachnoid hemorrhage

A case report: Managing a complex neurological patient within primary care

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Introduction

Charcot-Marie-Tooth disease (CMT) is a hereditary neuropathy affecting the peripheral nervous system. Type 1A, an autosomal dominant demyelinating polyneuropathy, is the most common type. This case report emphasizes the complexity of managing a patient with CMT through primary care.

Case Report

33 years ago, now a 58-year-old female, was diagnosed with CMT type 1A, just like her mother and her daughter. An electromyoneurography from 2007 showed subtotal denervation of the feet and chronic lesions in lower leg muscles. Two years ago, she was referred to a physiatrist due to worsening of the symptoms, including progressive weakness and pain in the left foot with persistent weakness in the right foot. She denied arm weakness. Physical examination showed a steppage gait, especially on the left side, as well as hypotrophy of the distal musculature. She performed toe walking with minor balance difficulties but could not perform dorsiflexion nor heel walking. Cervical and lumbosacral syndromes aggravate her underlying disease. Cavus foot is present bilaterally with flexion contractures. Vertigo, present since childhood, along with walking difficulties, led to a fifth metatarsal fracture in 2024. Over the years, psychiatric care was required due to depression and alcohol abuse, leading to chronic pancreatitis in 2011. She is also diagnosed with gastroesophageal reflux disease, anemia, osteopenia, Hashimoto's thyroiditis, diffuse cystic mastopathy, asthma and atrial fibrillation. Her conditions require regular visits to the physician for referrals and prescriptions. While gene therapy is being explored, the preferred treatment remains inpatient rehabilitation. Despite her condition, she works from home as a graphic designer in a newspaper and wishes to continue.

Conclusion

Managing patients with complex neurological conditions requires continuous coordination between specialists and primary care providers. This case highlights the importance of a personalized approach and multidisciplinary care in improving the patient's quality of life and maintaining functionality for as long as possible.

Keywords:

Charcot-Marie-Tooth Disease; Neuromuscular Diseases; Polyneuropathies; Primary Health Care; Rehabilitation

Acute ischaemic stroke in a young adult

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Introduction

Acute ischemic stroke (AIS) is a condition caused by sudden loss of blood circulation to an area of the brain, which leads to neurological deficit. Although it mostly occurs in older age, the incidence is rising in younger age groups due to increased risk factors. Timing of symptom onset plays a crucial role in choosing the right treatment for the AIS, which can be intravenous thrombolysis and mechanical thrombectomy. In this abstract we present a case of AIS in a young patient, emphasizing treatment and outcomes.

Case Report

A 21-year-old female patient was admitted to the Clinic of Neurology in Rijeka following a mechanical thrombectomy. Her medical history was significant for hypertrophic cardiomyopathy with three previous myocardial infarctions. Her symptoms began abruptly the day before admission, presenting with right-sided weakness and confusion. Upon arrival at Pula General Hospital, the patient was somnolent with right-sided hemiparesis and aphasia, with a National Institutes of Health Stroke Scale (NIHSS) score of 18. Urgent neuroradiological screening revealed an occlusion in the M1 segment of the left middle cerebral artery, prompting referral to the Clinical Hospital Center Rijeka (CHCR) for mechanical thrombectomy. Upon arrival at CHCR, she had persistent right-sided central hemiparesis, but a partial recovery of speech; NIHSS: 12. The procedure was successfully performed, achieving Thrombolysis in Cerebral Infarction (TICI) grade 3 reperfusion. After the control computed tomography scan of the brain, the patient was transferred to the Clinic of Neurology. The patient demonstrated significant neurological recovery by the time of discharge, with only mild dysarthria and slight right arm weakness; NIHSS: 2.

Discussion/Conclusion

Even though AIS is rare in young adults, this case emphasizes the importance of close monitoring of patients with existing risk factors to reduce the possibility of the stroke. It also highlights how effective mechanical thrombectomy is and the significant improvement of clinical outcomes after the procedure is done, as seen in this case where patient's recovery went from severe neurological deficit to near-complete functional restoration.

Keywords:

Middle cerebral artery/ Risk factors/ Stroke/ Thrombectomy/ Young adult

A 6-year-old boy with Miller-Fisher syndrome – a case report

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Introduction
Miller-Fisher syndrome is a rare variant of the Guillain-Barré syndrome that occurs in 1-2:1,000,000 cases of Guillain-Barré syndrome. It usually presents with at least 2 of the following symptoms: ataxia, areflexia and ophthalmoplegia. Miller-Fisher syndrome is a localized variant of the Guillain-Barré syndrome, mainly affecting cranial nerves. Just like Guillain-Barré syndrome, it is an autoimmune disease caused by antibodies that target gangliosides in the myelin sheath.

Case Report
A 6-year-old boy presented to the emergency room because his mother had noticed he was having difficulties keeping his eyes open. Prior to the presentation, he had an acute respiratory infection for 6 days, which was treated with co-amoxiclav. On the day of admission, he reported diplopia while watching television. Upon examination, he had no fever and his vitals were normal. Neurological examination found patellar areflexia. Lumbar puncture was performed twice – the first sample showed no signs of pathology, while the second one showed proteinorachia. No changes were found on neuroimaging studies. Ophthalmology evaluation confirmed the bilateral ptosis and ophthalmoplegia. Chest X-ray was clear and electroencephalogram was normal. Electromyoneurography showed bilateral patellar areflexia. Microbiological testing for C. jejuni was negative. The patient met the clinical criteria for Miller-Fisher syndrome which was later confirmed by a lab finding of anti-GD1a IgG and anti- GQ1b IgG. During his stay, he received a 5-day course of intravenous immunoglobulins. The patient made a full recovery and was discharged.

Discussion/Conclusion
Even though the mean age of onset is 43 years, it is important to test for anti-GD1a and anti- GQ1b IgG in children who suddenly develop neurological symptoms shortly after they have had a respiratory or a gastrointestinal infection.

Keywords:
Miller-Fisher Syndrome; Neurology; Ophthalmoplegia; Pediatrics; Areflexia

A Rare Case of Cerebral Air Embolism After Dental Extraction

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Introduction
Iatrogenically caused cerebral air embolism is an extremely rare but potentially dangerous complication of minimally invasive procedures. The exact pathophysiological mechanism of air embolism secondary to a dental intervention is not well known. However, it is believed that the injection of air by a high-speed dental drill through the soft tissue is the most common cause. This results in an increase in pressure, allowing the air to enter the bloodstream and create air bubbles in the cerebrovascular system.

Case Report
We present an 81-year-old female patient who was admitted to the Department of Neurology at the Clinical Hospital Center Osijek with symptoms suggestive of an acute stroke, following a tooth extraction. Neurological examination revealed general weakness, paresthesia in both arms and the right leg, drooping of the left corner of the mouth, as well as astasia and abasia. Computed tomography scan and angiography of the brain showed free gas bubbles in the cavernous sinus and in the pterygopalatine fossa, with no other pathological changes. That was likely caused by air entering the right maxillary sinus during the dental procedure. The patient spontaneously recovered within 24 hours without any residual deficits. This supports mechanism of transient ischemic attack, in contrast to permanent ischemia. A follow-up scan a few days later showed no remaining air bubbles, so hyperbaric chamber therapy was not recommended.

Discussion/Conclusion
The goal of this case is to highlight cerebral air embolism as a rare but possibly fatal complication of regular dental interventions. It is important for healthcare providers to be aware of such a vascular incident if it occurs after dental procedures. Although the patient showed complete recovery with no residual deficits, sometimes air embolism after dental extraction can lead to severe health consequences.

Keywords:
Embolism, Air; Intracranial Embolism; Ischemic Attack, Transient; Paresthesia; Tooth Extraction

Early onset epilepsy in an infant with trisomy 5p: clinical and genetic insights

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Introduction

Neonatal seizures are defined as sudden, abnormal alteration of electrographic activity from birth to the end of the neonatal period. They are often linked to metabolic, structural or genetic abnormalities. This case presents an infant with neonatal epilepsy of unknown etiology, exhibiting convulsive episodes with nystagmus and abnormal electroencephalogram (EEG) findings.

Case Report

A male infant, born at 41+1 weeks via vaginal delivery (Apgar 10/10, BW 3240 g), was admitted at two months due to episodes of gaze fixation, limb tremors, and apnea, which were indicative of potential seizures. Clinical exam revealed hypotonia, persistent nystagmus, axial hypotonus and poor motor control. MRI showed enlarged subarachnoid spaces frontally and interhemispherically, with otherwise normal parenchymal findings. EEG monitoring revealed focal centrotemporal epileptiform discharges without generalized paroxysms. Cranial ultrasound showed no signs of brain anomalies. Infectious, metabolic, and biochemical workup including lactate, amino acids, homocysteine, and B12 was normal. CSF analysis excluded CNS infection. Ophthalmologic evaluation confirmed horizontal nystagmus with poor fixation and visual tracking. Dermatologic consultation noted eczema and erythematous scalp lesions. Genetic testing (WES+, Blueprint Genetics, Finland) confirmed heterozygous 5p15.33p13.2 duplication (chr5:9,1652527_35991459dup), consistent with Trisomy 5p. This rare syndrome is associated with developmental delay, epilepsy, and hypotonia. Initial antiepileptic therapy with valproic acid and pyridoxine had no effect. Seizures resolved upon initiation of levetiracetam. The patient was discharged on levetiracetam, pyridoxine, and vitamin D supplementation. Follow-up EEG showed no epileptic paroxysms. The infant remains stable but with continued neurological immaturity, hypotonia, and motor delay.

Discussion/Conclusion

This case illustrates the importance of early genetic assessment in newborns with neonatal seizures. The diagnosis of Trisomy 5p provided a confirming a genetic etiology which further helped in deciding appropriate treatment options and long-term care. Multidisciplinary care and neurodevelopmental monitoring are crucial for optimizing outcomes.

Keywords:

Antiepileptic Agents; Child Development; Electroencephalography; Hypotonia; Neurodevelopmental Disorders

When Fever Strikes the Brain: the Genetic Key to Recurrent Encephalopathy

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Introduction

Recurrent episodes of acute necrotizing encephalopathy (ANE) often triggered by acute febrile infections are typical clinical features of an extremely rare genetic disorder, familial ANE associated with progressive motor, mental and cognitive regression, yet potentially fatal, with the onset in early childhood.

Case Report

Fourteen-year-old non-ambulant male patient presented with paralytic strabismus, spastic diparesis, talocrural contractures, axial hypotonia with occasional tremor and ataxia. Physical examination revealed extreme joint hypermobility and positive bilateral plantar extensor response. Hyperreflexia was more pronounced on upper extremities, and absent abdominal reflexes. First episode of ANE occurred at 18 months associated with high fever, vomiting, followed later with a generalized tonic-clonic epileptic seizure, as well as the all subsequent episodes of ANE including the last one, manifested with identical clinical sings. Cerebrospinal fluid examination showed significant proteinorachia (3,35 g/L, normal range 0.20 – 0.45 g/l). Brain MRI revealed extensive supra- and infratentorial hyperintensities involving thalamic nuclei. Considering the family history from his mother's side (mother had meningitis at the age of 8, and her brother at merely 5 months and again at 2 years of age) a possible RAN-binding protein 2 (RANPB2) pathogenic gene variant was considered and later confirmed. He was treated with tizanidine for spasticity and antiseizure medication (lorazepam, midazolam and risperidone).

Discussion/Conclusion

RANBP2 protein is associated with the maintenance of the brain's protective barrier. However, the role of pathogenic variants in infection-induced acute encephalopathy is still unclear. Considering a progressive nature of the disease and the fact there is no etiological treatment at this point, the focus of the treatment should be on early recognition, early diagnosis and appropriate treatment with individual approach. The importance of timely genetic testing and early intervention in rare disorders is emphasized based on early established appropriate diagnosis.

Keywords:

Acute Necrotizing Encephalitis; Ataxia; Genetic Testing; RANBP2 Protein, Human; Seizure Disorder, Tonic-Clonic

Rapid Initiation of Clozapine for first-episode psychosis with acute suicide risk

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Introduction
First Episode Psychosis (FEP) refers to the onset of overt psychosis symptoms, particularly delusions and/or hallucinations or disorganized speech. Pharmacotherapy for an FEP includes second and third-generation antipsychotics as the first line of treatment, with a low dose initiation and slow titration to attain a minimum effective dose of the medication.

Case Report
A 29-year-old male presented with psychotic decompensation after an eight-day religious program. The patient presented with spatial and temporal disorientation, lacked insight, and showed no signs of psychomotor agitation. His train of thought was incoherent with auditory hallucinations. The patient denied aggressive or suicidal thoughts. Neurological status showed no neurological deficits; he also denied using psychoactive substances. The patient was administered diazepam, risperidone, biperiden, and low dose quetiapine, after which he reported feeling better. The patient was without hallucinations and delusions with partial insight; therefore, quetiapine was discontinued. After a few days, the patient deteriorated, showing fear of hurting someone and reported for the first time having suicidal thoughts with concrete suicidal ideation. Clozapine was introduced at a dose of 150 mg without gradual titration. He was transferred to the intensive care unit. After two days, the patient was calm and denied suicidal or heteroaggressive thoughts and impulses. He was transferred back to a non- acute ward for continued treatment.

Conclusion
Clozapine is rarely recommended in first-episode psychosis, although some guidelines like Croatian guidelines for treatment of schizophrenia allow for its early administration. Standard protocols emphasize gradual titration to minimize potential side effects. However, clozapine has well-documented anti-suicidal properties, thus is a valuable option in acute situations where rapid intervention is necessary. Fast titration protocols have been published previously, supporting its use in urgent cases. Our case demonstrates that initiating clozapine at a higher dose in a life-threatening psychiatric emergency can be effective and lead to a significant improvement in the patient's condition.

Keywords
Clozapine, Delusions, Hallucinations, Psychotic Disorders, Suicidal Ideation

Recurrent Right Central Retinal Artery Occlusion with Full Vision Recovery - A Case Report

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Introduction
Central retinal artery occlusion (CRAO) is a severe ophthalmic emergency that can cause sudden vision loss. It results from an interruption of blood flow through the central retinal artery, most commonly due to thromboembolism or vasospasm, with or without retinal ischemia. Symptoms present as sudden, painless, and unilateral vision loss. Only a small percentage of patients achieve full visual recovery and that is why this case report highlights a rare but significant clinical outcome.

Case Report
A 63-year-old male patient was admitted to the Department of Intensive Neurology due to sudden vision loss. Upon admission, he had no other neurological symptoms besides painless impaired vision. Thrombolytic therapy with alteplase was immediately administered which led to early complete revascularization of the right central retinal artery. The patient experienced full vision recovery and 24 hours after the alteplase was given, a follow-up computed tomography (CT) scan showed no signs of acute ischemia or hemorrhage. The patient was transferred to the Department of Neurorehabilitation and Neuroimmunology for further evaluation. Antiplatelet therapy with acetylsalicylic acid and rivaroxaban was initiated upon the transfer. Interestingly, the patient had experienced identical symptoms 10 days earlier. An ophthalmic examination confirmed right CRAO with no other neurological symptoms.

However, neither thrombolytic therapy nor mechanical thrombectomy was performed, as his vision spontaneously recovered, and a control CT scan revealed no ischemic or hemorrhagic lesions. Months earlier, the patient had recovered from a pulmonary embolism and was diagnosed with dyslipidemia, internal carotid artery stenosis, and vertebrobasilar insufficiency - conditions that likely contributed to CRAO.

Discussion/Conclusion
Early diagnosis and timely intervention are essential in preventing permanent vision loss in CRAO cases. In this patient, prompt thrombolytic therapy led to complete visual recovery, emphasizing the importance of immediate treatment. Effective management of vascular conditions, including dyslipidemia and carotid stenosis, is crucial in reducing recurrence risk and preventing complications.

Keywords:
Alteplase, Blindness, Central Retinal Artery Occlusion, Ischemia, Thrombolysis

Poster Session 4

Family Medicine and Mental Health: Enhancing Patient Care

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Introduction
Family medicine often serves as the first point of contact between patients with mental health disorders and family medicine doctors. It plays a crucial role in addressing these disorders and raising awareness in the community about the importance of accepting individuals with mental health challenges. However, many doctors are not adequately trained to manage such patients, highlighting the need for more research and training in family medicine for managing mental health disorders.

Materials and Methods
The PubMed database was searched utilizing the keywords "psychiatrist," "family medicine," "mental disorders," "primary care," "consultation," and "approach," which resulted in 35 findings. Only research focusing on the management of mental health disorders by family medicine doctors was included.

Literature Review
Studies have shown that the management of patients with mental health disorders varies widely depending on the physician's personality traits and education. Research indicates that physicians with greater empathy and a desire to expand their knowledge tend to care more for their patients. Among other issues, a lack of appropriate training poses the biggest challenge in managing these patients. Furthermore, insufficient time for proper patient assessments has been identified as problematic. However, evidence suggests that a multidisciplinary approach, especially one where family medicine doctors and psychiatrists collaborate, is most effective in ensuring patients' adequate health and community integration. This highlights the importance of collaboration in enhancing patient care outcomes.

Discussion/Conclusion
Croatia is one of the European countries with the highest number of psychiatric hospital beds, where the prevailing belief remains that individuals with mental health disorders should be treated in a hospital setting, which often leads, at best, to remission. Community treatment is a more effective approach for patients with mental health issues, and family medicine doctors, in collaboration with psychiatrists, can facilitate this and enhance patient care outcomes.

Keywords:
Family Medicine, Mental Disorders, Primary Care, Multidisciplinary Approach, Patient Care

Melkersson-Rosenthal syndrome: a Puzzling Case of Orofacial Edema

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Introduction
Melkersson-Rosenthal syndrome (MRS) is a rare neurological disorder characterized by the triad of recurrent orofacial swelling, facial nerve palsy, and a fissured tongue. Its etiology remains unclear, although autoimmune and genetic factors are suspected contributors. Due to its intermittent nature and nonspecific symptoms, MRS is often misdiagnosed early.

Case Report
A 41-year-old female patient, with a history of autoimmune hypothyroidism under endocrinological follow-up, presented to the emergency department in August 2024 with burning sensations around the lips and gums, accompanied by mild lip swelling. Notably, the symptoms did not appear to be triggered by food intake. The symptoms were managed conservatively with analgesics, and she was referred for further dental evaluation. Within days, the patient experienced recurrent swelling affecting the lower right side of her face and lips, though symptoms resolved spontaneously. She was subsequently evaluated by her family physician, who referred her for allergy testing (including inhalant and food allergens); results were negative. An ultrasound of the salivary glands ruled out sialoadenitis and sialolithiasis. A dental examination raised suspicion of Melkersson-Rosenthal syndrome, leading to the prescription of topical clobetasol propionate (0.05%). However, in February 2025, she presented again to the emergency department with similar symptoms despite topical corticosteroid use. A neurologist was consulted, and based on clinical findings, a provisional diagnosis of MRS was made. Intramuscular methylprednisolone (125 mg) was administered, resulting in complete symptom resolution within 24 hours. She was referred for a further neurological consultation to evaluate the need for long-term nonsteroidal anti-inflammatory drug (NSAID) and/or corticosteroid therapy and a follow-up plan is being considered.

Discussion/Conclusion
This case highlights the diagnostic challenges of Melkersson-Rosenthal syndrome, especially in the early stages. The incomplete triad often leads to misdiagnosis and treatment delays. Corticosteroids are the primary management, with early intervention potentially reducing recurrence, severity, and unnecessary interventions.

Keywords:
Autoimmune Diseases; Corticosteroids; Edema; Melkersson-Rosenthal Syndrome; Neurologic Examination

Sex differences among acute ischaemic stroke patients undergoing intravenous thrombolysis

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Introduction
Outcomes after ischemic stroke regarding sex differences are still controversial, and regional variations remain underexplored. Our study compares the vascular risk profiles and outcome differences of women and men who underwent intravenous thrombolysis (IVT) in a comprehensive stroke center in Szeged, Hungary.

Materials and Methods
We conducted a retrospective analysis using patient data from the national STAY ALIVE Acute Stroke Registry. Only patients who underwent IVT at the University of Szeged were included. Outcome measures included the discharge National Institute of Health Stroke Scale (NIHSS) scores, and 90-day modified Rankin scale (mRS) scores.

Results
A total of 270 patients were included, with 128 (47.4%) being females and 142 (52.6%) being males. Significant sex differences were observed in several vascular risk factors. Atrial fibrillation was more prevalent in females (18% vs. 8.5%, p=0.020), whereas males had higher rates of diabetes mellitus (25.8% vs. 38.0%, p=0.032), previous cerebrovascular events (18.0% vs. 31.7%, p=0.009), smoking (15.6% vs. 33.1%, p=0.001) and excess alcohol consumption (11.7% vs. 42.4%, p<0.001). Males had a higher median body mass index (23.8 vs. 25.5, p=0.017), while females presented with higher mean systolic blood pressure (171.6 vs. 164.4 mmHg, p=0.032).

There were also notable differences in etiology, with large-artery atherosclerosis being more common in males (10.2% vs. 20.4%, p=0.020). Despite these baseline differences, no discernable sex-based disparities were observed in clinical outcomes, as median NIHSS at discharge (3.0 vs. 4.0, p=0.065) and median 90-day mRS scores (2.0 vs.2.0, p=0.349) were similar between groups. Unadjusted ordinal regression analysis showed that male sex was associated with non-significantly lower odds of a worse mRS score (OR 0.790, 95% CI -0.728-0.256, p=0.347).

Discussion/Conclusion
Our findings indicate that despite significant differences in vascular risk profiles and stroke etiology between sexes, short- and long-term outcomes after IVT were similar in a Hungarian cohort.

Keywords:
Ischemic stroke, Risk factors, Sex Characteristics, Thrombolytic therapy, Treatment outcome

Acute Necrotizing Encephalopathy Following Severe Mycoplasma Pneumoniae Infection: A Case Report

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Introduction
Acute necrotizing encephalopathy (ANE) is a rare but severe neurological complication that can occur following systemic infection with influenza, enterovirus, SARS-CoV-2 and rarely Mycoplasma pneumoniae. It is characterized by symmetric brain lesions, rapid neurological decline, and a high incidence of severe complications or death.

Case Report
A 32-year-old male presented to the emergency room with fever of 39°C and profuse diarrhea, experiencing over 10 episodes within 24 hours. Upon arrival, he was in a soporose state and was immediately hospitalized. Empirical antibiotic therapy with ceftriaxone was initiated. Relevant medical history included right-sided paresis of unknown origin persisting for the last six years.

Over the next two days, the patient's condition deteriorated, showing increased somnolence and declining oxygen saturation, though meningeal signs were negative. A thoracic computed tomography scan (CT) revealed extensive infiltrates in the lower and upper posterior lobes of the lungs, along with severe carnification. Brain CT showed symmetrical hypodense changes in the basal ganglia and thalamus of unclear etiology.

Antibiotic therapy was escalated to piperacillin/tazobactam, azithromycin, and metronidazole. Due to respiratory failure, the patient required mechanical ventilation for eight weeks. Cerebrospinal fluid analysis showed normal biochemical parameters, no pleocytosis, and negative cytology and microbiology. Bronchoalveolar lavage confirmed Mycoplasma pneumoniae infection. The patient was diagnosed with acute necrotizing encephalopathy and treated with azithromycin (5 days), pulse steroid therapy (1g/day for 5 days with gradual tapering), and intravenous immunoglobulin (1g/kg for 2 days).

Recovery was slow. At five months post-infection, the patient demonstrates psychomotor impairment with reduced verbal communication and worsened right-sided paresis. Rehabilitation plan includes extensive physiotherapy and speech therapy.

Discussion/Conclusion
This case highlights the severe neurological complications that can follow Mycoplasma pneumoniae infections, emphasizing the importance of early recognition and aggressive treatment of ANE. The patient's history of paresis, combined with the presentation of ANE, suggests a possible genetic predisposition. Vigilant observation and further investigation is advised.

Keywords:
Anti-bacterial Agents; Central Nervous System Infections; Intravenous Immunoglobulins; Mycoplasma Pneumoniae; Paresis

Isolated Intraorbital Myositis of the Right Superior Oblique and Medial Rectus Muscles: A Case Report

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Introduction
Ophthalmoplegia refers to impaired eye movement due to dysfunction of the ocular muscles or cranial nerves. The most common cause of painful ophthalmoplegia is Tolosa-Hunt syndrome, a rare condition characterized by inflammation of the cavernous sinus and surrounding structures. However, ophthalmoplegia can also result from isolated intraorbital myositis, a rare cause highlighted in this case. This report emphasizes the importance of accurate differential diagnosis and recognizing rare causes of ophthalmoplegia, like myositis, for appropriate treatment.

Case Report
A 70-year-old female was admitted to the Neurology Department, UHC Osijek, with a three-week history of painful right-sided ophthalmoplegia. Neurological examination revealed a divergent position of the right eye, with absent adduction and horizontal diplopia when looking left. Laboratory tests showed elevated creatine kinase (CK) levels, suggesting muscle inflammation. Methylprednisolone was initiated, along with gastroprotective therapy. Orbital MRI revealed thickening of the right medial and superior oblique muscles, confirming myositis. No evidence of granulomatous lesions or oculomotor nerve involvement was found. A rheumatology consultation excluded systemic autoimmune disease. The patient was discharged with oral prednisone, leading to complete resolution of symptoms.

Conclusion
This case illustrates a rare occurrence of isolated intraorbital myositis affecting the right superior oblique muscle, confirmed through thorough diagnostic evaluation. The patient responded well to corticosteroid therapy. Recognizing myositis as a potential cause of painful ophthalmoplegia is crucial for accurate diagnosis and optimal treatment.

Keywords:
Myositis, Oculomotor Muscles; Ophthalmoplegia, Prednisone; Tolosa-Hunt Syndrome

Managing War-Related PTSD During Times of Heightened Triggers

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Introduction
Post-Traumatic Stress Disorder (PTSD) is a complex mental health condition that arises following exposure to traumatic events, significantly impacting an individual's emotional, cognitive, and behavioral functioning. One of the most challenging aspects of PTSD is its susceptibility to triggers, which are external or internal stimuli that evoke memories, emotions, or physiological responses associated with the original trauma.

Case Report
A 53-year-old male was admitted to the Clinic for Psychiatry in Rijeka. He experienced war trauma, from which he developed PTSD. The patient reported restlessness and insomnia, reactively triggered by the anniversary of his wartime experiences. He was also triggered by the sound of firecrackers and fireworks. Another significant trigger for him was the suicide of both his friends from combat. Upon admission, the patient was intrapsychically and psychomotorly tense, shaking in fear since the previous night and experiencing flashbacks. However, he denied any suicidal or hetero-aggressive behaviors or intentions. His thought process was formally coherent, with no indications of deeper psychopathology in content. His mood was currently low, while his will and basic drives were preserved. He was hospitalized and successfully treated with a combination of psychopharmacotherapy, including mood stabilizers, antidepressants, and anxiolytics, as well as group therapy.

Discussion/Conclusion
In this case, specific triggers, including the anniversary of a traumatic war event, the noise of fireworks and firecrackers, and the suicide of the patient's friends, exacerbated his PTSD symptoms, leading to increased anxiety, restlessness, and insomnia. Hospitalization during periods of heightened distress, along with group therapy and combined psychopharmacotherapy, was crucial in stabilizing the patient's condition and improving his overall well-being.

Keywords:
Armed Conflict, Post-Traumatic Neuroses, PTSD, War Neurosis, War-Related Trauma

Antibody Negative Autoimmune Encephalitis

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Introduction

Autoimmune encephalitis can be presented with acute onset of neuropsychiatric symptoms, altered level of consciousness, seizures, irritability or movement disorders in previously healthy patients. The most common autoantibodies target the N-methyl-D-aspartate receptor (NMDAR), although not all cases are presented with positive autoantibodies. Incidence is approximately 0.8/100,000 person-years, with 1.5% cases classified as antibody-negative.

Case Report

A 7-year-old girl was admitted to the Intensive Care Unit because of altered mental status. The patient was transferred from another hospital and upon arrival was analgosedated, intubated and parenterally hydrated. On the day of transfer, she had diplopia, strabismus, vertigo and was unable to control her legs, leading to falling and hitting her head. The 7 days before her behavior was unusual; she yelled at the neighbors and was agitated. On the third day of the hospitalization the patient was extubated, then at times agitated or unresponsive. She was also unstable when walking. A magnetic resonance showed findings characteristic of leptomeningitis with leptomeningeal opacifications bilaterally parietooccipitaly and partially in the frontal lobe. The cerebrospinal fluid analysis did not reveal any specific findings. PCR testing using the meningitis/encephalitis panel did not detect any microorganisms. Antibodies characteristic for autoimmune encephalitis were negative. The therapy included pulse corticosteroid therapy with metilprednisolon over the course of 5 days and parenteral imunoglobulins.

Discussion/Conclusion

This case report highlights the diagnostic challenges of autoimmune encephalitis, as its clinical presentation may overlap with infectious, metabolic, and psychiatric disorders. In conclusion, doctors should include autoimmune encephalitis in the differential diagnosis of conditions that clinically suggest probable encephalitis, even if antibodies are negative.

Keywords:

Autoantibodies, Autoimmune, Encephalitis, Neuropsychiatric, N-methyl-D-aspartate receptor

Alcohol as a Means of Self-Medication for Post- Traumatic Stress Disorder

Tihana Majetić, Diana Palaić, Andrijana Andrešić, Ana Bardić, Borna Borić

Introduction

Alcoholism is a chronic disorder marked by excessive drinking and dependence, often leading to serious consequences. Some individuals use alcohol to self-medicate PTSD, finding temporary relief that ultimately worsens the condition. Understanding this link is crucial for effective treatment.

Case Report

A 48-year old male patient presents at the Clinic for Psychiatry Rijeka in an intoxicated state, with a history of anxiety and alcoholism that was treated by a private psychiatrist. His alcoholism resulted in the loss of his job and divorce. Following a psychological evaluation, it was revealed that he is a war veteran who developed symptoms such as heightened arousal and war-related nightmares after experiencing significant trauma, including burying the dead under shelling. These symptoms contributed to the development of PTSD. Initially, he used alcohol as a coping mechanism during combat and continued to self-medicate to manage the distressing symptoms of PTSD. He underwent combined pharmacotherapy and group therapy, which led to significant improvement in his condition.

Discussion/Conclusion

Alcohol as a coping strategy is ultimately harmful as it exacerbates the symptoms of PTSD, leading to increased dependency, worsened mental health, and further emotional and physical deterioration. Instead of resolving the underlying trauma, alcohol merely masks the symptoms, creating a vicious cycle. Treatment with combined pharmacotherapy and group therapy offers a far more effective approach, addressing both the psychological and physiological aspects of PTSD and alcoholism, leading to significant and sustainable improvement in the individual's mental health.

Keywords:

Alcohol Addiction, PTSD, Intoxication, Chronic Alcoholic, Posttraumatic

Chronic Schizophrenia with Neurological Symptoms: A Case Report on Cognitive and Motor Impairments

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Introduction
Schizophrenia is a serious mental disorder affecting thoughts, emotions, and behavior. It can cause hallucinations, delusions, and disorganized thinking, making daily life difficult. Without treatment, it may lead to cognitive decline and social challenges. However, early intervention with medication and therapy can improve long-term outcomes and quality of life.

Case Report
This case presents a 37-year old female patient with chronic schizophrenia, displaying severe psychotic symptoms, cognitive impairment, and significant neurological symptoms including tremors, headaches, and dizziness. While pharmacotherapy has led to partial symptom relief, long-term management including psychosocial interventions, continuous monitoring, and neurological evaluation is essential to improving her quality of life and identifying potential underlying causes of her neurological symptoms. Upon hospitalisation, the patient exhibited significant emotional distress, persecutory delusions, and impaired cognitive function warranting further investigation. Neurological examination noted mild hand tremors, slightly reduced coordination and episodic dizziness without other significant abnormalities, whereas computerized tomography scan of the brain showed no significant structural abnormalities except for incipient symmetrical, i.e. diffuse cortical reduction, bitemporally and in the frontal zone.

The patient was released in her fathers care with a specific treatment plan which included Clozapine 100 mg, Lurasidone 37 mg, Sertraline 50 mg, Lorazepam 2,5 mg (as needed) and instructions of frequent follow-up appointments.

Discussion/Conclusion
This case highlights the challenges of managing chronic schizophrenia with neurological symptoms. While medication provided partial relief, ongoing monitoring, psychosocial support, and further neurological evaluation are essential for optimizing the patient's long-term well- being.

Keywords:
Cognitive Dysfunction, Dizziness, Psychotic Disorders, Schizophrenia, Tremor

Acute Oculomotor Nerve Palsy Following Gastroenteritis: A Case of Parainfectious Neuropathy

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Introduction
The etiologies of oculomotor nerve lesions include congenital, vascular, migrainous, traumatic and parainfectious causes. Clinically, these lesions manifest as mydriasis, blepharoptosis and impaired ocular motility. This case report highlights the critical importance of obtaining a detailed medical history and systematically excluding all differential diagnoses to accurately determine the underlying cause of the disease.

Case Report
A 52-year-old female patient with a medical history of hypertension and depression was admitted to the neurology department due to right eyelid ptosis and blurred vision, which were preceded by a gastrointestinal viral infection lasting several days. Brain computed tomography and angiography of the head and neck arteries revealed no significant acute changes. Lumbar puncture with cerebrospinal fluid biochemical analysis revealed proteinorhachia with otherwise unremarkable findings. Serological profiling indicated past exposure to Herpes Simplex virus type 1, Epstein-Barr virus and Cytomegalovirus with no evidence of acute infection. During hospitalization, the patient received a 5-day course of pulse corticosteroid therapy with intravenous methylprednisolone (500 mg), resulting in a favorable clinical response - by the third day, right eyelid ptosis had regressed.

Supportive treatment included intravenous saline infusion, antihypertensive, gastroprotective and antidepressant therapy. Immunological analysis of CSF ruled out central nervous system inflammation caused by Borrelia burgdorferi, tick-borne encephalitis virus, Usutu virus and West Nile virus, as well as myasthenia gravis. Brain and orbital magnetic resonance imaging excluded tumors and cerebral venous sinus thrombosis.

Discussion/Conclusion
Following comprehensive diagnostic evaluation and a process of exclusion, findings were deemed consistent with a parainfectious lesion of the oculomotor nerve, clinically manifesting as right eyelid ptosis. Corticosteroid therapy shortened recovery time, but caution is necessary due to possible side effects. This case serves as a reminder that even seemingly benign symptoms such as diarrhea should not be underestimated, as they may represent the initial manifestation of a significant underlying condition.

Keywords:
eyelid ptosis, gastroenteritis, inflammation, oculomotor nerve, 6th nerve palsy

Human Herpesvirus-6 Encephalitis in Adults: A Silent Threat with Severe Consequences

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Introduction
Human herpesvirus-6 (HHV-6) is a DNA virus primarily known for causing roseola infantum in children under the age of three. Neurological manifestations, including encephalitis, demyelinating disorders, and acute encephalopathy with biphasic seizure syndrome may complicate primary infection. Although HHV–6–induced encephalitis in adults is rare, it can occur either as a primary infection or due to viral reactivation. This paper presents a rare case of encephalitis in an adult patient caused by the HHV-6 virus.

Case Report
A 71-year-old man was admitted to the Emergency Department with a suspected cerebrovascular event (CVE). His medical history included a recurrent CVE two years prior, which resulted in central facioparesis, dysarthria, and a mildly ataxic gait. Upon admission, he was encephalopathic, febrile, and exhibited neck stiffness, along with elevated inflammatory markers in the blood. Brain magnetic resonance imaging (MRI) confirmed age-related brain atrophy in the context of chronic multi-infarct microangiopathy. Electroencephalography (EEG) revealed diffuse dysrhythmic activity with generalized slowing, most prominent in the frontotemporal regions. A lumbar puncture was performed, revealing mild pleocytosis and elevated protein levels in the cerebrospinal fluid (CSF). Multiplex polymerase chain reaction (PCR) testing of the CSF detected human herpesvirus-6 (HHV-6). Color Doppler flow imaging demonstrated early-stage hemodynamically significant stenosis of both internal carotid arteries. The patient was initiated on intravenous ganciclovir at a reduced dose due to renal insufficiency. Antiviral therapy was administered for a total of 21 days, leading to a gradual improvement in his overall condition and a regression of both clinical and laboratory indicators of infection.

Discussion/Conclusion
This case highlights the importance of considering HHV-6 as a potential etiological agent in adult encephalitis, particularly in patients with unexplained neurological deterioration. While HHV-6 encephalitis is uncommon in adults, timely diagnosis through PCR testing and appropriate antiviral therapy can significantly improve outcomes.

Keywords:
Electroencephalography; Encephalitis; Ganciclovir; Herpesvirus 6, Human; Spinal Puncture

Friday – April 11th
Plenary lecture 3

Transsphenoidal Endoscopic Surgery for Pituitary Gland Tumors

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Transsphenoidal endoscopic surgery is a minimally invasive procedure used to treat pituitary tumors. This technique involves accessing the pituitary gland through the nasal cavity, specifically the sphenoid sinus. With the assistance of an endoscope.

During the procedure, the surgeon navigates through the sphenoid sinus to reach the pituitary gland. This approach eliminates the need for external incisions, reducing the risk of complications and allowing for a faster recovery compared to traditional open surgeries. Transsphenoidal endoscopic surgery offers several advantages. Firstly, the enhanced visualization provided by the endoscope allows for precise tumor removal while minimizing damage to healthy surrounding tissues. Additionally, it offers the potential to access tumors in challenging locations within the pituitary gland. Transsphenoidal endoscopic surgery has revolutionized the treatment of pituitary tumors, providing a safer and more effective alternative to traditional surgical approaches. Its minimally invasive nature, coupled with improved visualization and precision, has led to better patient outcomes and enhanced quality of life for individuals undergoing this procedure. First Pituitary surgery in our hospital has been performed in 1922. Today we are operating more then 80 cases per year. We will show our resuts within last 10 years.

Plenary lecture 4

Involvement of the Peptidergic Edinger-Westphal Nucleus in the Neurobiology of Migraine

Dr. Ammar Al-Omari, PhD

The urocortin 1 (UCN1)-expressing centrally projecting Edinger-Westphal nucleus (EWcp) is affected by the circadian rhythm, hormonal changes, stress and pain that are known to trigger migraine. Here we aimed at investigating the possible role of EWcp in migraine.

RNAscope in situ hybridization (ISH) combined with immunostaining was used to examine the expression of calcitonin gene-related peptide (CGRP) receptor components in both mouse and human EWcp and dorsal raphe nucleus (DRN). Tracing study examined connection between EWcp and the spinal trigeminal nucleus (STN). The intraperitoneal CGRP injection model of migraine was applied and validated by light-dark box and von Frey assays in C57BL/6J mice, ISH combined with immunostaining was used to assess the functional and morphological changes. The functional connectivity matrix of Edinger-Westphal (EW) was examined using fMRI in control humans and interictal migraineurs.

We proved the expression of CGRP receptor components in both murine and human DRN and EWcp. We identified a direct urocortinergic projection from EWcp to the STN. Photophobic behavior, periorbital hyperalgesia, increased FOS immunoreactivity in the lateral periaqueductal gray matter and trigeminal ganglia as well as P-CREB in the STN supported the efficacy of CGRP-induced migraine-like state. Intraperitoneal CGRP administration increased the expression of FOS, Ucn1 mRNA and peptide content of EWcp/UCN1 neurons. Both serotonin and tryptophan hydroxylase 2 levels decreased in the DRN. Ablation of EWcp/UCN1 neurons reversed CGRP induced photophobia and induced periorbital hyper algesia. A positive functional connectivity between EW and STN as well as DRN has been identified by fMRI.

The presented data strongly suggests a regulatory role for EWcp/UCN1 neurons in migraine via neuroanatomical connection with the STN and DRN with high translational value.

Plenary lecture 5

Susac Syndrome: When the brain, eyes and ears collide

Josip Čičak, MD, Neurology Resident
General Hospital “Dr. Josip Benčević” Slavonski Brod

Susac syndrome is a rare disease characterized by the clinical triad of encephalopathy, branch retinal artery occlusion, and sensorineural hearing loss; however, the complete triad is only present in a minority of patients , which leads to delays in diagnosis. It primarily affects young women aged between 20 and 40 years. The differential diagnoses of Susac syndrome include multiple sclerosis, Ménière's disease, and acute disseminated encephalomyelitis. Characteristic findings include "snowball" lesions of the mid-corpus callosum, as shown on MRI of the brain, evidence of partial or complete branch retinal artery occlusion (BRAO) on fluorescein angiogram (FA), and deficits in the low to medium frequency ranges, averaging approximately 40 dB in audiogram. Treatment includes immunosuppressive agents. Delays in diagnosis and treatment can result in up to 50% of patients developing cognitive impairment and other neurological sequelae. This presentation includes a case report of a patient from my clinical practice.

Plenary lecture 6

There is something wrong with my MAM? The ER-mitochondria signalling in amyotrophic lateral sclerosis

Andrea Markovinović, PhD, mag.pharm.inv.
Faculty of Medicine, University of Rijeka, Croatia

Amyotrophic lateral sclerosis (ALS) is a rapidly progressive, fatal neurodegenerative disease that causes muscle weakness, paralysis, and respiratory failure. Most patients die within 3 to 5 years of diagnosis, with no cure or effective treatment available. Disruptions in the endoplasmic reticulum (ER)-mitochondria signalling have been identified as a key feature of ALS. Moreover, signalling between the ER and mitochondria regulates many of the functions that are damaged in ALS. These include mitochondrial bioenergetics, lipid metabolism, axonal transport, and synaptic function. Signalling between the ER and mitochondria is facilitated by close physical contacts between the two organelles that are mediated by the VAPB-PTPIP51 “tethering” proteins. VAPB is an integral ER protein that binds to the outer mitochondrial membrane protein PTPIP51, forming these “tethers”. A number of familial genetic ALS insults, including mutant TDP-43, C9ORF72 and FUS, have now been shown to disrupt VAPB-PTPIP51 interactions and ER-mitochondria signalling. This disruption in VAPB-PTPIP51 interactions is also observed in motor neurons from post-mortem sporadic ALS cases. Such findings support the notion that restoring ER-mitochondria tethering and the VAPB-PTPIP51 interaction may correct damage linked to the disease and be broadly therapeutic. Here, we present evidence supporting this idea. Findings will be presented on the role of VAPB-PTPIP51 in Ca2+ delivery from ER to mitochondria, which is the primary function of VAPB-PTPIP51 tethers and synaptic function in neurons in ALS. We will also show potential approaches for targeting the VAPB-PTPIP51 tethers as a novel therapy for ALS. In conclusion, correcting damage to the VAPB-PTPIP51 tethers may have therapeutic values for ALS and other neurodegenerative diseases.

Friday – April 11th
Student Session 1

Concurrence of multiple sclerosis and vascular malformations of the brain and brainstem: Case report

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Introduction
Cerebral arteriovenous malformations (AVMs), characterized by feeding arteries, a nidus, and draining veins, are congenital vascular anomalies. Their most common and serious presentation is intracerebral hemorrhage (ICH), typically occurring between the ages of 20 and 40. AVMs are diagnosed using imaging techniques such as computed tomography (CT), magnetic resonance (MR) imaging, and digital subtraction angiography (DSA), which is the gold standard. AVMs can mimic multiple sclerosis (MS) symptoms and show similar radiological changes, often leading to misdiagnosis. The coexistence of MS and intracranial vascular malformations is rarely described in the literature.

Case Report
A 28-year-old patient presented to the Neurology Clinic with headaches, visual disturbances, gait difficulties, and speech impairment. MR imaging revealed demyelinating plaques in the periventricular region, corpus callosum and cerebellar peduncles along with altered signal intensities indicative of AV malformations. The patient was diagnosed with multiple sclerosis, confirmed by lumbar puncture and the detection of oligoclonal bands characteristic of MS. Since diagnosis, the patient has been treated with fingolimod. CT angiography and DSA confirmed two AV malformations: one in the frontal lobe and another at the cranio- cerebral junction. Based on the cerebrovascular board’s conclusion, endovascular occlusion with Onyx was performed on the frontal AVM, while the brainstem AVM remained untreated due to high risk.

Discussion/Conclusion
The main risks of cerebral AVMs are seizures and hemorrhage, depending on their size, location, and the presence of the "steal phenomenon," where blood is diverted away from normal brain tissue. Treating AVMs is complex and involves surgical resection, endovascular therapy, radiosurgery (e.g., Gamma Knife), or a combination. Experts often debate the best approach, which is assessed using the Spetzler-Martin grading scale based on size, location, and venous drainage. AVMs require a multidisciplinary strategy tailored to each case. Depending on complexity, treatment may be singular or combined, but always demands a careful, individualized approach. During the course of the literature review, no cases of concurrent multiple sclerosis and AVMs were found. The literature only describes instances where AVMs mimic the clinical presentation and MRI findings of multiple sclerosis.

Keywords:
AV malformations, Digital Subtraction Angiography, Endovascular Procedure, Magnetic Resonance Imaging, Multiple Sclerosis

Rare Case of PNET/Ewing's Sarcoma in an Adult: A Case Report

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Introduction

Primitive neuroectodermal tumor (PNET)/Ewing's sarcoma is a rare, aggressive malignant tumor, commonly affecting children and young adults. While this condition is exceedingly rare in adults over the age of 30, primary localization in the spine is even rarer, with nonsacral spine cases comprising just 0.9% of occurrences. We report a case of Ewing's sarcoma in a 64-year-old female patient, localized in the paraspinal region of the lumbar spine.

Case Report

A 64-year-old female patient presented with severe left-sided lumbar pain lasting for two months. The patient had been previously treated for bilateral breast cancer. MRI showed a lobulated pathological infiltrate on the left paravertebral side from L2 to L5 level, causing complete spinal canal stenosis at L3/L4 level and moderate stenosis at L2/L3 level. PET-CT confirmed the tumor's presence, leading to urgent surgical tumor ablation. Postoperative histopathological analysis revealed monomorphic round cells forming solid nests and pseudorosettes, with immunohistochemistry showing diffuse positivity for CD99 and FLI1. Molecular testing detected an EWSR1-FLI1 translocation, leading to a diagnosis of PNET/Ewing's sarcoma. Despite the initially good postoperative recovery, the patient shortly developed new left leg pain and was unable to bear weight on it. Follow-up MRI showed recurrence of the lesion, infiltrating the L3/L4 neural foramen, left psoas muscle, and extending caudally to the S1/S2 level, with additional involvement of the left L4 lamina and L3 vertebra. The patient underwent a second surgery, resulting in pain regression, although left leg monoparesis persisted. Radiotherapy to the lumbosacral region was initiated three weeks later, with chemotherapy planned for future oncological management.

Discussion/Conclusion

Despite advancements in cancer treatment, PNET/Ewing's sarcoma remains highly aggressive and prone to recurrence and metastasis, leading to poor outcomes in adults. Achieving gross total resection is difficult, so a multidisciplinary approach is crucial, with chemotherapy and radiotherapy surpassing surgery in importance.

Keywords:

Ewing's Sarcoma; Neuroectodermal Tumor; Neurosurgery; Primitive Neuroectodermal Tumor; Spinal Stenosis

Chronic neuropathic pain management after spinal cord injury with spinal cord stimulation: a case report

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Introduction

Chronic neuropathic pain following spinal cord injury (SCI) is one of the most challenging pain conditions to manage, significantly impairing the quality of life for more than fifty percent of individuals affected and is often resistant to conventional pharmacological treatments. Spinal cord stimulation (SCS) has emerged as potential therapy for those with refractory SCI-related pain.

Case Report

This case report describes the management of chronic neuropathic pain in a 61-year-old male patient who sustained a SCI from a gunshot wound in 1991. Over the past year, the patient experienced worsening pain in his lower back and both legs. Neurological examination revealed spastic paraparesis, more pronounced in the left leg, along with left leg hypoesthesia. MSCT imaging of the lumbar spine showed no significant herniations or stenosis, and neurosurgical intervention was not deemed necessary. After exhausting all pharmacological treatments, SCS was recommended as a potential alternative. The procedure, performed under local anesthesia, involved the placement of epidural electrodes at the ThVIII vertebral level and a neurostimulator in the left gluteal region. The operation proceeded without complications. Postoperatively, the patient was mobilized on the first day, and the stimulation parameters were adjusted for optimal results. At the two-month follow-up, the patient reported a significant reduction in pain (VAS 0-2, compared to 8 preoperatively) and a remarkable improvement in his quality of life.

Discussion/Conclusion

This case illustrates the potential effectiveness of spinal cord stimulation in managing chronic neuropathic pain following SCI due to a gunshot wound. While the results are promising, there is limited evidence in the literature regarding the use of SCS specifically for SCI-related neuropathic pain, due in part to the scarcity of case series and clinical reports. Further research is needed to understand its mechanism and to establish guidelines for its broader application in the treatment of SCI-associated neuropathic pain.

Keywords:

Cord Injuries; Neurosurgery; Pain Management; Spinal Cord; Stimulation, Spinal Cord

Therapeutic problems associated with atypical location of epidermoid cyst - case report and literature review

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Introduction
Epidermoid cysts are rare, slow-growing, benign extra-axial neoplasms, accounting for approximately 1-2% of all intracranial neoplasms. They are most commonly localized around the cerebellopontine angle, the fourth ventricle and the spinal cord. Brainstem involvement, especially with a simultaneous intra- and extra-axial component are extremely rare. Surgical intervention remains the only effective treatment modality, however, it requires special caution due to the risk of damage to neural structures and the occurrence of chemical meningitis.

Case Report
49-year-old female presented with a several-year history of a tumor in the posterior cranial fossa, radiologically diagnosed as an epidermoid cyst. Due to the location of the tumor, the patient had previously not qualified for surgical treatment. During subsequent follow-up, the patient exhibited progressive deterioration in right-sided hemiparesis and impaired mobility of the right eyeball. In preparation for surgical treatment, a full diagnostic workup was performed. An MRI scan revealed a cyst-like lesion involving the parasellar region, both internal carotid arteries, the basilar artery and penetrating into the pons from the right side. The patient was scheduled for a two-stage operation to remove the epidermoid cyst. The first stage of the operation was performed without any intraoperative complications, and the patient is currently awaiting the second stage of surgery.

Discussion/Conclusion
The case under discussion poses significant challenges in terms of localizing the epidermoid cyst, particularly in eloquent areas, due to the high risk of neurological and vascular damage associated with its surgical removal. The complexity of the surgical treatment approach outlined in this study is further compounded by the necessity of accessing the tumor in a manner that ensures complete removal. Many surgical approaches have been documented in the literature, however, the intraoperative management scheme depends on the tumor location, the patient's anatomy and the team's expertise.

Keywords:
Brainstem; Cerebellopontine Angle; Epidermoid Cyst; Pons; Surgical Procedures

Student Session 2

Cardiofaciocutaneous Syndrome and BRAF Mutation: Exploring the Genetic Link – A Case Report

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Introduction
Cardiofaciocutaneous syndrome is an autosomal dominant syndrome caused by mutations of one of the genes of the RAS-MAPK pathway, which also includes a mutation of the BRAF gene. The mentioned genes play a key role in normal cell proliferation and differentiation. The syndrome is clinically manifested by ectodermal, cardiac and craniofacial abnormalities followed by neurological disorders.

Case Report
This case presents a female patient who has been monitored since birth due to the absence of regular physiological development. The girl is the 5th child, her siblings are healthy, and no anomalies were observed during the pregnancy. During the first few months, intellectual disability, craniofacial dysmorphism and feeding difficulties were observed. Additionally, the girl suffered from complex urinary tract anomalies and consequent proteinuria. She started walking independently at the age of four years and six months. Further, the patient experienced an epileptic seizure accompanied by severe convulsions, loss of consciousness and airway obstruction at the age of six. At the age of fifteen, her vocabulary was limited to 100 words, and she had not yet adopted hygiene habits. Moreover, she had poorly developed social skills, and required constant supervision due to her difficulty perceiving dangerous situations. On top of that, certain behavioral issues occurred occasionally, such as irritability, aggression and attention seeking. In 2023, genetic testing was conducted, determining the BRAF mutation and leading to the diagnosis of cardiofaciocutaneous syndrome.

Discussion/Conclusion
This case emphasizes the importance of genetic testing in the process of establishing etiological diagnosis in children with neurodevelopmental disorder. Availability of new genetic methods contributes to the improvement of healthcare for patients.

Keywords:
Anomalies, congenital, epilepsy, mutation, syndrome

Cerebral venous thrombosis as a rare initial clinical presentation of Behcet's disease

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Introduction
The thrombosis of the brain's venous sinuses is a rare clinical presentation of Bechet disease. This condition causes blood stasis, venous hypertension, intracranial hypertension, and papilledema. Behçet Disease is an inflammatory perivasculitis characterized by recurrent mucocutaneous ulcers that can involve almost every organ system in the body. Its prevalence is estimated at 10.3 per 100,000 population, with central nervous system involvement in 10% of cases.

Case Report
A 37-year-old male patient was admitted to the neurology department because of intermittent blurred vision lasting 5 seconds at a time for the past month. A dull headache accompanied it without vegetative symptomatology. Ophthalmological examination revealed bilateral papilledema of the optic nerve. Brain magnetic resonance imaging (MRI) venography and orbit MRI confirmed partial thrombosis of the left and right transverse venous sinuses. Low molecular weight heparin was administered subcutaneously in a therapeutic dosage of 2x80 mg. After one month, the patient presented with intermittent high temperatures up to 38 degrees Celsius along with blurred visions and weight loss. At the time, no skin or mucosal changes were present in the oral or genital areas. In the following weeks, a comprehensive immunological workup revealed B51 positivity, followed by a positive Pathergy test indicating Behçet's disease. After two weeks, positron emission tomography/computed tomography (PET/CT) scans confirmed large vessel vasculitis. That result was followed by corticosteroid therapy with the addition of infliximab and the previously mentioned anticoagulant medication. Shortly after that period, a general malaise occurred with abdominal pain, gastric retention, acute renal failure, hematochesia, and difficulty breathing. This led to uremia and cardiac arrest, resulting in death despite all CPR measures taken.

Conclusion
Neurological signs and involvement of the large venous brain system in Behcet disease is a rare initial manifestation. Earlier diagnosis and timely treatment, according to EULAR guidelines, could have prevented a fatal outcome.

Keywords
Behçet Disease, Intracranial Hypertension, Papilledema, Vasculitis, Venous Sinus Thrombosis.

Neuroinflammation After Subarachnoid Hemorrhage: Progress, Challenges and Perspectives

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Introduction
Subarachnoid hemorrhage (SAH) is a life-threatening condition, associated with high mortality, affecting mainly reproductive-age patients. Early brain injury (EBI) is central to the pathophysiology of SAH, and inflammation is a driving factor of EBI. However, few studies have explored the early inflammatory response after SAH, leaving it misunderstood.

Materials and Methods
Early inflammatory response after SAH was initially studied in clinical settings then in the experimental SAH model. The clinical study monitored 47 patients and analyzed the dynamics of pro-inflammatory cytokines. We analyzed the associations between IL-6, IL-1β, and TNFα in blood and cerebrospinal fluid (CSF) samples, along with clinical characteristics using mixed- effect models. The experimental portion used a perforation model of SAH in male rats. After SAH induction we followed with mRNA analysis of TNFα, IL-1β, IL-6, ICAM-1, and VCAM- 1 in areas near and far from the hematoma, along with serum measurements of TNFα, IL-1β, and IL-6.

Results
In patients, serum levels of inflammatory cytokines do not reflect the early response in the brain. The CSF levels of IL-6 were increased post-SAH, although with high variability. The study concluded a significant association with Glasgow Coma Scale ($p = 0.0095$) and borderline effect of the Hunt and Hess scale ($p = 0.0887$). We conducted the experimental study to explain the variability of inflammatory response and found out that neuroinflammatory response is of global character ($p<0,05$) and about its dependence on the severity of SAH insult ($p<0,05$).

Discussion/Conclusion
This study highlights the role of IL-6 dynamics in CSF as a potential marker for subarachnoid hemorrhage. Due to its high variability further research is needed to establish reliable biomarkers that correlate CSF or serum balance with clinical outcomes and improve overall prognosis. This work was supported by the grant of the Ministry of Health of the Czech Republic No. NU23- 04-00382.

Keywords:
Early brain injury, Inflammation, Interleukin-6, Subarachnoid hemorrhage, Stroke

Pharmacoresistant autoimmune epilepsy

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Introduction

Pharmacoresistant epilepsy represents a significant health, social, and economic burden to patients, their families, and society. In more than one -third of these patients, misdiagnosis or unrecognized etiology is the cause of pharmacoresistance. The immune etiology was officially recognized in the New Classification of Epilepsy by the International League Against Epilepsy in 2017. Unfortunately, autoimmune epilepsy (AE) is still underdiagnosed and, consequently, inadequately treated. AE should be distinguished from autoimmune enceph alitis, which can present with seizures as well.

Case Report

We present two patients with an autoimmune disorder underlying recurrent seizures.

Patient 1: A 64-year-old, MRI-negative patient with focal epilepsy, accompanied by the subacute development of cognitive and psychotic disturbances, presented with daily aware motor seizures with no response to antiepileptic drugs (AEDs). EEG and routine laboratory findings were nonspecific. Positive serum LGI1 antibodies suggested autoimmune encepha litis. First -line immunotherapy (steroids, IVIg) showed a good response. After second-line therapy (rituximab), the patient became seizure-free without any cognitive impairment (3 years follow-up).

Patient 2 : A 57-year-old patient with a long history of pharmacoresistant epilepsy and type 1 diabetes mellitus presented with high -frequency focal to bilateral tonic -clonic seizures. He had tried all available AEDs and vagal nerve stimulation, with minimal respons e and progressive worsening over the year. Further investigation revealed high anti-GAD antibody titers, leading to the initiation of immunotherapy. First -line immunotherapy showed no response; however, after second-line therapy (tocilizumab), the patient showed a favorable clinical response with a 50% reduction in seizures (complete remission of tonic-clonic seizures) and improvement in cognitive function (6-month follow-up).

Discussion/Conclusion

An immune etiologyshould be considered in patients with pharmacoresistant epilepsy accompanied with cognitive or psychiatric disturbances or a history of other autoimmune disorders. Diagnosing AE is challenging, as MRI, EEG, laboratory findings, and antibody testing may be negative or nonspecific. Early treatment has shown better outcomes.

Keywords:

Anticonvulsants, Autoimmune Diseases of the Nervous System, Epilepsy, Immunotherapy, Vagus Nerve Stimulation

Saturday – April 12th

Plenary lecture 7

Basic physiology and clinical relevance of sleep

Ivan Božić, MD, PhD

Insula County Hospital, Rab

Basic physiological features, structure and possible functions of sleep will be presented as well as the most important sleep disorders and sleep disturbances as symptoms of other diseases.

Student Session 3

Postpartum disorders: Neurobiological foundations and Psychodynamic Approach

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Introduction
Postpartum disorders are psychiatric conditions that start within twelve weeks postpartum. More than 80% of women experience mild to severe psychological symptoms during this period. Postpartum psychological disorders include postpartum blues („Baby blues"), postpartum depression, postpartum psychosis, and postpartum anxiety disorder. These conditions may be caused by hormonal fluctuations (decline in estrogen and progesterone levels), serotonin imbalances, and the interplay of neurobiological factors with profound psychological and emotional processes, including unresolved past conflicts.

Case Report
A 35-year-old primiparous mother presented with symptoms consistent with postpartum depression, including persistent dysphoric mood, frequent episodes of uncontrollable crying, heightened anxiety, and an inability to care for her newborn. The patient reported feelings of guilt, disrupted sleep, and passive suicidal thoughts, which were quantified using the Edinburgh Postnatal Depression Scale. Management included a pharmacological-psychodynamic approach. Administration of paroxetine and diazepam led to a complete resolution of acute symptoms. At the same time, psychotherapy revealed that the disorder reactivated repressed conflicts with her mother, marked by emotional unavailability and feelings of neglect during her childhood. These unresolved issues manifested as heightened anxiety and a sense of inadequacy in her maternal role. Psychodynamic therapy focused on raising awareness of repressed emotions and their impact on her current emotional state. Through treatment, the patient resolved internal conflicts with her mother, enabling an emotional connection with her child, and the release of guilt.

Discussion/Conclusion
This case emphasizes the importance of psychodynamic therapy for a profound understanding of unconscious emotional processes and their influence on motherhood. A combination of pharmacotherapy, which stabilizes neurological functions, and psychodynamic work facilitates recovery, not only from the acute symptoms of postpartum depression but also from deeper emotional barriers that triggered them.

Keywords:
Anxiety; Depression,Postpartum; Mental health; Postpartum period; Psychotherapy,Psychodynamic

When hormones create delusions: a multidisciplinary approach to psychosis treatment

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Introduction
This case report illustrates the complexity of the relationship between endocrine disorders and psychopathology, emphasizing the importance of a multidisciplinary approach to diagnosis and treatment. It presents a patient who developed a transient psychotic episode due to pathological hyperthyroidism, requiring simultaneous endocrinological and psychiatric management.

Case Report
A 28-year-old female patient was admitted to the Clinic for Psychiatry due to panic attacks and occasional transient psychotic episodes. Her symptoms included restlessness, excessive preoccupation with somatic complaints (hair loss, itchy skin), social isolation, and depressive thoughts with psychotic features. She also experienced somatic symptoms such as insomnia, fatigue, tremor, tachycardia, and weight loss despite a normal appetite. Laboratory tests were performed, revealing normal complete and differential blood counts, while thyroid function tests confirmed hyperthyroidism with elevated TSH, FT3, and FT4 levels. Neurological and psychiatric assessments indicated high anxiety, paranoid ideation, and depressive states, with no abnormalities detected on electroencephalography (EEG). Treatment required a multidisciplinary approach. Antipsychotics (clozapine) were prescribed for psychotic episodes, antidepressants (fluvoxamine) for depressive symptoms, and anxiolytics (alprazolam) to manage acute anxiety. Endocrinological treatment included antithyroid therapy to regulate hyperthyroidism. Upon discharge, psychotic and depressive symptoms gradually diminished.

Fluvoxamine was discontinued, antipsychotic therapy was gradually tapered, while mood stabilizers (pregabalin) and anxiolytics were continued. Antithyroid therapy with thiamazole proved effective, leading to normalization of thyroid hormone levels after six months.

Discussion/Conclusion
This case highlights the importance of a multidisciplinary approach in treating psychopathological symptoms associated with endocrine disorders. Hyperthyroidism, often overlooked as a cause of psychotic symptoms, can significantly impact mental health. Timely diagnosis and treatment of this condition, alongside integrated psychiatric and endocrinological management, are crucial for successfully treating patients with complex clinical presentations.

Keywords:
Endocrinology, hormones, psychotic disorders, psychiatry, TSH

Cerebrovascular Accident in a Psychiatric Patient Presenting with Visual Hallucinations

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Introduction
A cerebrovascular accident (CVA) is a sudden loss of brain function caused by a loss in blood supply to the brain. CVA is often characterized by the rapid onset of neurological symptoms such as hemiparesis, sensory abnormalities, and aphasia. A hallucination is a false perception of objects or events. Hallucinations may be a symptom of a psychosis-related disorder but can also occur in neurological conditions, such as CVA. Receptive dysphasia is a partial loss of language, where comprehension is reduced, but speech remains intact.

Case Report
We present the case of a 73-year-old female patient experiencing visual hallucinations in the form of snails crawling over her body. She was admitted to the psychiatric ward in January 2025 (her third admission there) due to visual illusions and disorientation. Her first two hospitalizations were in 2022 due to depressive episodes containing elements of psychosis. This latest admission occurred three days after a fall, caused by weakness and dizziness while getting up. A reliable medical history could not be obtained by the patient due to confusion and receptive dysphasia. Thus, head injury could not be ruled out. While performing the 10-metre walk test, she swayed toward the right. She was then examined by a neurologist, who found paresis of the left leg, a positive Romberg sign, and a positive Babinski sign on the right. MSCT of the brain revealed no pathomorphologic abnormalities, and CDFI of carotid arteries showed no significant stenosis. The patient remains in psychiatric care and is currently medicated and stable.

Discussion/Conclusion
This case illustrates the importance of recognizing variability in clinical presentations of CVA. In this patient, visual hallucinations and receptive dysphasia indicated an underlying neurological cause. Patients with a history of psychiatric treatment should not be overlooked in regard to neurological evaluation, especially when combined with a recent history of a fall.

Keywords:
Cerebrovascular Accident, Confusion, Psychotic Affective Disorder, Receptive Dysphasia, Visual Hallucination

Breaking the Silence: Anorexia Nervosa in Men

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Introduction
Anorexia nervosa is often misdiagnosed in men due to stigma and bias. This case highlights a decade-long struggle, severe complications and the need for early intervention, sustained support and greater awareness of male eating disorders.

Case Report
A 14-year-old boy was admitted for evaluation in 2013 due to significant weight loss and abnormal renal function laboratory parameters (urea: 12.4 mmol/L, creatinine: 105 µmol/L). Upon further assessment, the predominant findings at admission were acute kidney injury with azotemia, hypernatremia (Na: 156 mmol/L), hyperchloremia (Cl: 116 mmol/L), hyperosmolality (serum osmolality: 344 Osm/kg) and metabolic alkalosis (HCO_3: 28.4 mmol/L). A psychological evaluation revealed an emotional developmental disorder and anorexia nervosa. The patient reported that two years prior, he began intentionally restricting food intake due to dissatisfaction with his appearance, describing himself as "chubby." He was discharged with a dietary plan and scheduled for weekly follow-ups with a psychologist and child psychiatrist.

In 2023, now a 24-year-old young man, was transported by ambulance from KBC Rebro for a planned hospitalization due to severe anorexia nervosa (BMI: 12 kg/m²). His condition had deteriorated following independent living, three Erasmus study exchanges, social withdrawal, extreme dietary restrictions and bizarre eating habits over the past two years (including the consumption of burnt-carbonized food).

After two weeks of hospitalization, he was discharged with prescriptions for risperidone, olanzapine, mirtazapine, zolpidem, omeprazole and B-complex vitamins, along with recommendations for regular outpatient follow-ups. Over the following months, he attended regular check-ups but was inconsistent with the Day Hospital program. Consequently, he was readmitted due to worsening psychiatric symptoms but was discharged against medical advice after four days.

Discussion/Conclusion
Male anorexia nervosa requires greater recognition and early intervention. This case highlights its severe physical and psychological impact, emphasizing the need for continuous psychiatric care, adherence to treatment and increased awareness to improve outcomes for affected individuals.

Keywords:
Anorexia Nervosa; Body Dysmorphic Disorders; Eating Disorders; Malnutrition; Mental Health

Sunday – April 13th
Poster Session 5

Cryptogenic stroke with underlying Turner's syndrome: behind the mask

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Introduction
Turner's syndrome (TS) is one of the most common chromosomal disorders that can often go unrecognized until adulthood. Research on TS continues to reveal new challenges considering long-term complications due to increased morbidity because of autoimmune disorders, diabetes, osteoporosis, and cardiovascular (CV) diseases often present in these patients.

There is growing concern regarding a higher percentage of cerebrovascular incidents (CVI) reported in TS, with most attributed to CV diseases and a shorter lifespan (13–15 years) compared to the general population.

Case Report
A 54–year–old female patient was admitted to the neurological emergency ward due to speech difficulty and lethargy. Her medical history was unremarkable except for hypertension and the fact that she never menstruated (never tried having children and was never thoroughly examined by a gynecologist or pediatrician). Neurological examination showed right-sided central facial palsy, while computer tomography (CT) and magnetic resonance imaging of the brain later detected a small ischemic area along the anterior horn of the left lateral ventricle.

Further neurovascular and cardiological exams were unremarkable, pertaining to cryptogenic stroke (CS). CT angiography revealed a dissection of the descending aorta with extension to the right common carotid (remaining stagnant on a follow–up exam) and segmental infarction of the left kidney. Regarding those above, alongside clinical findings (bilateral temporary reduction of hearing, short stature, pterygium, slight retrognathia and no visible secondary sex characteristics) she was referred to genetic counseling and a gynecological examination. An ultrasound of the pelvis revealed uterine and ovarian agenesis, while genetic analysis presented 45, XO karyotype, confirming TS.

Discussion/Conclusion
Premature mortality in TS often involves CVI due to an underlying connective tissue disorder, hypertension, or both, causing aneurysms and strokes. It is vital to provide extensive diagnostics with a multidisciplinary approach, never forgetting the patient's previous medical history's importance and always considering other possibilities.

Keywords:
cryptogenic stroke, genetic counseling, Turner's syndrome

Culture as a problem and a solution: case report of a patient with prolonged mourning

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Introduction
The presentation of a mental disorder can be strongly influenced by the culture in which a person grew up, and cultural factors can significantly shape the process of help and provide resources for recovery. Moreover, mental suffering in immigrants can be caused by a conflict of values between the native and the new culture. We present an example of a person with prolonged mourning disorder that arose as a result of a conflict in funeral and mourning practices between African local culture and Croatia as the patient's new homeland.

Case Report
A 41-year-old man, college graduate, father of a four-year-old child, who moved to Croatia 20 years ago from Central Africa, came for treatment due to prolonged mourning. Two years after the loss of his wife he was still in intense mourning with features of a moderate major depressive episode. He felt that he could not grieve effectively because of the conflicting mourning practices in the Croatian versus the African culture. We agreed on psychotherapy as a form of treatment. Before treatment, he tried to resolve the mourning through the rituals of his native culture, but without improvement. In the process of help, we elaborated on the differences in the cultural practices of mourning between the native and the new culture. This work, which was initially conceived as an introductory research of personal epistemology and resources for change, had an unexpectedly fast effect on improvement. After 5 meetings, the continuation of treatment was not necessary. We understood the rapid improvement was a consequence of cultural specificities in the patient's personal epistemology. Four years after the treatment, the patient is in a new relationship and has a second child.

Discussion/Conclusion
This case highlights the importance of cultural sensitivity in mental health care. Understanding a patient's cultural background can help clinicians tailor therapy for better outcomes. Applying culturally informed approaches may improve treatment for other ethnic patients facing similar conflicts in mourning and mental health.

Keywords:
Culture, Depressive disorder, major, Emigrants and Immigrants, Psychotherapy

Borreliosis- Neuroborreliosis or mental illness trigger

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Introduction
Lyme disease is the most common tick-borne disease. Neuroborreliosis results from dissemination of Borrelia burgdorferi to the central nervous system. Its clinical presentation varies depending on the stage of the infection but is often characterized by sensory, motor, and cognitive symptoms. In rare cases, psychiatric disorders like depression, schizophrenia-like psychosis and panic attacks can occur, leading to difficulties in diagnosis and delayed treatment.

Case Report
19-year-old female presents with chronic fatigue, weight loss, periodical episodes of incoherent and slurred speech and short-term episodes of auditory hallucinations. Following the next three weeks, she was nauseous, had blurry vision, occasional shivers while afebrile and myokymia of the right side of the face. Meningeal syndrome was ruled out. Four days later the patient was disoriented and had sudden psychomotor agitation. The computed tomography of the brain and the cerebrospinal fluid (CSF) were normal. Due to occasional visual hallucinations, she was diagnosed with acute psychosis and hospitalized in psychiatry. In the next 24 hours, she was getting more disoriented, psychotic and had inferior ocular paralysis with suboptimal response to haloperidol and promazine. Electroencephalography and magnetic resonance imaging were both normal. Ceftriaxone and acyclovir were administered, followed by patients' recovery.

Additional analysis of CSF for rare encephalitis and Borrelia antibodies were negative. However, the serology report for borreliosis was positive, showing elevated levels of IgM (1,22) and IgG (2,03) antibodies, explaining the clinical presentation.

Discussion/Conclusion
Borreliosis can be accompanied by various psychiatric disorders, most commonly by painful hallucinations and somatic delusions. It's sometimes unclear whether the infection directly caused the psychiatric disturbances or if they were pre-existing and worsened by the disease. The large variety of clinical manifestations of neuroborreliosis urges us to think of it as a possible differential diagnosis in patients with „bizarre " neuro-symptomatology regardless of a positive or negative history of a thick bite.

Keywords:
Central Nervous System, Lyme Disease, Lyme Neuroborreliosis, Mental Disorders, Psychotic Disorders

Panhypopituitarism and Panic Attacks Caused by the Abuse of Corticosteroids

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Introduction
Panhypopituitarism is a condition in which the anterior pituitary lobe is insufficient, leading to hormone deficiencies. Individuals with panhypopituitarism who do not receive replacement therapy may experience an adrenal crisis, a life-threatening condition that can be traumatic for some patients and trigger an abnormal fear of death.

Case Report
A 37-year-old male patient has worked night shifts in the emergency department while attempting to attend the university during the day. He has had Hashimoto's thyroiditis since 19, treated with levothyroxine. Dissatisfied with his appearance, he started weight training and using testosterone. Excessive exercise caused back pain, which the family medicine doctor treated with injections of ketoprofen, hydrocortisone, and diazepam. Employed in the emergency department, he began self-administering hydrocortisone injections without medical supervision, reaching up to 600 mg daily. He first sought medical help for erectile dysfunction and was found to have deficiencies in testosterone, growth hormone, and cortisol. Since he concealed his steroid use, idiopathic panhypopituitarism was diagnosed. Irregular adherence to therapy led to an adrenal crisis and hospitalization in the intensive care unit. This triggered several panic attacks and a persistent fear of death, which prompted him to admit previous self- medication. He is now under regular endocrinological follow-up with gradual dose reduction of hydrocortisone and transdermal testosterone, currently daily at 15 mg and 50 mg respectively. He attends trauma group therapy every day and has been receiving 10 mg vortioxetine and 1,5 mg alprazolam daily for two months. His overall condition is improving, and he is preparing to return to work.

Discussion/Conclusion
Since panhypopituitarism can be iatrogenically induced, in idiopathic cases like this one, the possibility of medication abuse should be considered, especially among healthcare professionals. Due to the psychological impact of corticosteroid abuse and adrenal crisis, this patient required extensive psychiatric support and intervention.

Keywords:
Adjustment Disorders; Adrenal Insufficiency; Hydrocortisone; Panhypopituitarism; Panic Attacks

Primary Progressive Multiple Sclerosis and Unruptured Cerebral Aneurysm: A Case of Dual Neurological Pathology

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Introduction

A cerebral aneurysm is a weakened arterial wall in the brain that bulges out and fills with blood, often located in major arteries along the skull base. While small, unruptured aneurysms may be asymptomatic, larger ones may compress neural structures, causing various symptoms. Multiple sclerosis (MS) is a chronic, autoimmune disorder characterized by inflammation, demyelination, gliosis, and neuronal loss. Primary progressive MS (PPMS) affects 15-20% of patients, and shows gradual symptom worsening without relapses. The MS-cerebrovascular abnormalities coexistence raises important questions about potential shared mechanisms and clinical relevance.

Case Report

A 60-year-old female patient presented with memory difficulties and later developed balance issues with left-sided dizziness. Symptoms progressed over several months prompting magnetic resonance imaging (MRI), which showed Fazekas type 3 changes. Computed tomography angiography identified a 7.5x4.5mm saccular aneurysm in the right Internal Carotid Artery (ICA) and a 4.5mm aneurysm in the left Middle Cerebral Artery (MCA). The endovascular intervention included platinum coil embolization of the ICA aneurysm and flow diversion device in the MCA aneurysm. Two additional minor aneurysms were detected and are monitored. Further neurological evaluation showed right-sided allodynia and weakness, reduced manual strength (3-4/5), hyperreflexia (+3) in right extremities and left arm without pathological reflexes. Gait is spastic and ataxic. In the Romberg test, the patient sways with closed eyes and cannot perform tandem walking. Cervicothoracic MRI showed demyelinating spinal lesions. Brain MRI was re-evaluated, and demyelinating lesions were confirmed by an experienced neuroradiologist. Based on these findings, a diagnosis of PPMS was established, and ocrelizumab therapy was initiated.

Discussion/Conclusion

This case explores dual neurological pathology, emphasizing the importance of detailed neurological examination in patients presenting with atypical or progressive symptoms. While speculative, MS-related inflammation and blood-brain barrier disruption may contribute to vascular fragility. Further research is needed to clarify MS-cerebrovascular associations and guide management of overlapping conditions.

Keywords:

Computed Tomography Angiography; Demyelinating Autoimmune Diseases, CNS; Intracranial Aneurysm; Magnetic Resonance Imaging; Multiple Sclerosis, Chronic Progressive

Febrile neutropenia in patient with multiple sclerosis treated with ocrelizumab: A case report

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Introduction

Multiple sclerosis causes central nervous system impairment and tissue damage due to acute and chronic inflammation. Ocrelizumab, a humanized anti-CD20 monoclonal antibody, is approved for treating primary progressive multiple sclerosis (PPMS) that does not respond to immunomodulatory therapy, as well as relapsing forms of multiple sclerosis. However, ocrelizumab can cause febrile neutropenia, especially in individuals with infections. Febrile neutropenia is characterized by an absolute neutrophil count (ANC) below 1.5×10^9/L occurring more than four weeks after the last dose, despite previously normal levels.

Case Report

We present the case of a 35-year-old woman diagnosed with multiple sclerosis nine years ago, who had been receiving 300 mg of ocrelizumab intravenously for the past five years. She presented to the emergency department with fever (38.5 °C) and chills that had started three days before admission. She also reported pharyngitis, nasal congestion, and productive cough with yellow sputum. On examination, her blood pressure was 100/60 mmHg. She was conscious, alert, and oriented. She appeared afebrile, normocardic, eupneic, and anicteric.

Laboratory tests revealed leukopenia with an absolute neutrophil count of 0.0×10^9/L, low hemoglobin levels, and normal platelet counts. C-reactive protein (CRP) was elevated at 63.5 mg/L. Based on these findings, she was hospitalized with a diagnosis of febrile neutropenia. The patient was treated with a four-day course of meropenem and vancomycin. On the second day of hospitalization, fluconazole was added to the treatment regimen, and she received filgrastim (one ampoule daily) for two consecutive days. On the third day, she reported unilateral otalgia, which was diagnosed as viral tonsillitis with involvement of the right Eustachian tube. By the fourth day, her white blood cell count had increased to normal level, and her overall condition improved. Upon discharge, she was advised to continue clavulanic acid/amoxicillin and fluconazole for an additional five days alongside her chronic therapy.

Conclusion

Febrile neutropenia is a serious but preventable complication in patients receiving ocrelizumab. Identifying high-risk individuals through routine blood monitoring, implementing infection prevention strategies, and considering prophylactic treatments can significantly reduce the risk of febrile neutropenia and improve patient outcomes.

Keywords:

central nervous system, febrile neutropenia, multiple sclerosis, ocrelizumab

Stereotactic Radiosurgery vs. Whole Brain Radiotherapy for Melanoma Brain Metastases: Scoping Review

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Introduction
Brain metastases are a significant complication of advanced melanoma, with incidence rates of 20–30% within the first year of diagnosis and over 70% in autopsy findings. The primary radiation therapy (RT) techniques for melanoma brain metastases (MBMs) are whole-brain radiotherapy (WBRT) and stereotactic radiosurgery (SRS). According to National Comprehensive Cancer Network (NCCN) guidelines, SRS is recommended for patients with one to four metastases, while WBRT is used for diffuse CNS involvement. This review compares SRS and WBRT, focusing on treatment outcomes.

Materials and Methods
A comprehensive literature search was conducted in PubMed, Scopus, and Web of Science using keywords such as “melanoma brain metastases,” “stereotactic radiosurgery,” “whole-brain radiotherapy,” and “treatment outcomes,” yielding 62 studies published in English within the past 10 years. Duplicate records were removed, and two reviewers independently screened titles, abstracts, and full texts. Data extraction focused on study design, sample characteristics, interventions, and outcomes.

Scoping Review
Evidence suggests that SRS offers better local control and fewer neurocognitive side effects, while WBRT provides comprehensive coverage for diffuse metastases. A review of the 38 selected studies, which were predominantly retrospective analyses, revealed that SRS yields superior outcomes compared to WBRT. SRS achieved local control rates of 85–95% at one year, in contrast to 40–50% for WBRT. Furthermore, neurocognitive decline was noted in about 20% of patients who received SRS, compared to nearly 55% with WBRT. Additionally, recent data emphasize the advantages of combining SRS with systemic therapies, such as immunotherapy. Multiple studies have shown a 65% mortality reduction with SRS + anti-PD1 and 59% with SRS + anti-CTLA4 and/or anti-PD1 compared to SRS alone.

Discussion/Conclusion
Both SRS and WBRT are employed to manage melanoma brain metastases. Nonetheless, SRS is generally favored for patients with a limited number of lesions because of its enhanced local control and lower neurocognitive risks. Additionally, future studies should aim to investigate the combination of SRS with immunotherapy, which has previously demonstrated a notable reduction in mortality rates compared to SRS alone.

Keywords:
Melanoma; Neoplasm Metastasis; Radiosurgery; Radiotherapy; Treatment Outcome

When the Cure Becomes the Poison – Medication Overuse Headache

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Introduction
Medication overuse headache (MOH) is defined as a secondary headache in patients with a previous primary headache present for at least 15 days per month due to excessive and regular use of acute symptomatic therapy. MOH presents a serious problem considering the incidence of headaches and the ability of commonly used prescription and over-the-counter (OTC) analgetic drugs to cause such a condition, especially combination analgesics, non-steroid antireumatics (NSAR), and opioids.

Case Report
An unemployed 35-year-old woman came to the emergency room presenting with symptoms of a pulsating headache located on the right side of the head. Upon arrival, the patient negated trauma, nausea, and vomiting. The patient takes various analgesics including multiple NSAR and two combination analgesics, alongside consuming up to 4 liters of carbonated beverages and 1,5 liters of coffee daily. In addition to headaches, the patient complained about insomnia but insisted it was caused by the constant headaches and occasionally working night shifts. According to the patient’s medical history, she does not suffer from any chronic illnesses and is not prescribed any additional medication. Given the potential psychosomatic symptoms, psychologist conducted psychological testing and support, and outpatient treatment with a psychiatrist was recommended. During the hospitalization at the Department of Neurology, the patient underwent neuroradiological and neurophysiological tests, none of which showed any pathology. Laboratory tests showed elevation of hepatic enzymes up to 5 times the normal range. Tests on viral hepatic infections came back negative. After reducing the intake of medication, coffee, and carbonated beverages with the help of a placebo, a good decrease in hepatic enzymes was achieved. The role of the placebo was to initiate addiction treatment, which was continued later during outpatient treatment with a psychiatrist, but also to improve laboratory findings of liver enzymes. The patient was then discharged and prescribed amitriptyline and ursodeoxycholic acid. The patient was instructed to come for a follow-up neurological examination, but instead, she went to the emergency room on several occasions complaining of various pains.

Discussion/Conclusion
The case of a young woman exhibiting addictive behavior and developing MOH highlights the importance of awareness of this condition. Early recognition of the chronification of primary headache and initiation of prophylactic therapy can prevent excessive consumption of symptomatic treatment and the development of MOH.

Keywords:
Addictive behavior, analgesic drugs,analgesic overuse headache, neurology, secondary headache disorders

Successful Multimodal Management of Adult Medulloblastoma: A Rare Case Report

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Introduction
Medulloblastoma (MB) is the most common central nervous system malignancy in children. However, it is exceedingly rare in adults, accounting for only 0.4–1% of all CNS tumors in the population. MB typically arises in the cerebellar hemispheres and exhibits a male predominance in adults with variable outcomes. While surgery and radiotherapy are key components of treatment for adult medulloblastoma, the role of chemotherapy remains controversial.

Case Report
A 32-year-old male presented to the emergency department in March 2023 with a frontal headache that worsened upon head elevation. A brain CT scan revealed a post-contrast heterogeneously enhancing expansive lesion causing significant compression of the fourth ventricle and brainstem, without obstructing cerebrospinal fluid flow. The following day, a brain MRI confirmed a newly developed lesion located laterally in the cerebellar hemisphere with a nodular structure, identified as a desmoplastic/nodular medulloblastoma (MBEN), SHH subgroup. Maximal surgical resection of the primary tumor was performed, and histopathological examination confirmed the diagnosis. Molecular tumor profiling classified the tumor as WNT-activated. A full spinal MRI revealed no evidence of metastases, and lumbar puncture excluded malignant cells in the cerebrospinal fluid. Postoperative treatment included craniospinal radiotherapy with a total dose of 36 Gy to the craniospinal axis and a boost dose of 50.4 Gy to the posterior cranial fossa, determined based on postoperative MRI findings of suspected residual disease. The patient subsequently received six cycles of adjuvant chemotherapy according to the Packer A regimen, consisting of cisplatin, vincristine, and lomustine. During the 2 year follow-up period using MRI, patient remains in remission without neurological deficits with multidisciplinary management.

Discussion/Conclusion
This case highlights the successful treatment of adult medulloblastoma with a multimodal approach combining maximal surgical resection, craniospinal radiotherapy, and adjuvant chemotherapy. Multidisciplinary management and further studies are required for optimizing outcomes in adult patients with medulloblastoma.

Keywords:
Adult; Chemotherapy, Adjuvant; Medulloblastoma; Radiotherapy; WNT Signaling Pathway

The Role of Autonomic Dysregulation and Neurosonology in Carotid Artery Dissection: A Case Report

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Introduction
Carotid artery dissection accounts for up to 20% of ischemic strokes in young adults, often presenting with non-specific symptoms, making early diagnosis challenging. It may occur spontaneously, following trauma, or in association with genetic connective tissue disorders.

Case Report
A 25-year-old female presented with recurrent right-sided hemiparesthesia without prior trauma or abrupt neck movement. She reported left-sided headache and ear pain the previous evening, initially suspected ear infection. On admission, neurological examination showed right-sided hemiparesis, estimated at MRC 4/5, and anomic aphasia.

CT angiography demonstrated a left internal carotid artery (ICA) dissection with filiform narrowing at the C1-C2 level and hypoplastic A1 segment of right anterior cerebral artery (ACA), compensated by well-developed anterior communicating artery (ACoA). Due to a high thromboembolic risk, endovascular intervention was contraindicated, and dual antiplatelet therapy was initiated. MRI revealed acute ischemia in the left centrum semiovale, with a "string-of-pearls" sign adjacent to the left lateral ventricle, suggestive of a deep border-zone (watershed) infarct. Baseline neurosonology confirmed critically reduced flow in the left middle cerebral artery (MCA) and ACA, with insufficient collateral circulation.

During hospitalization, the patient's neurological status fluctuated, primarily due to hypotension with hypoperfusion, managed with intravenous norepinephrine and oral midodrine. Fluctuations included transient deepening of right hemiparesis and expressive aphasia. She underwent daily bedside physiotherapy.

Serial TCCS (Transcranial Color-Coded Sonography) demonstrated gradually increasing MCA flow, although velocities remained subnormal. By day 4, retrograde ophthalmic artery flow suggested partial compensation via the external carotid system, yet perfusion in the left ICA territory was inadequate. By day 18, follow-up TCCS showed indirect signs consistent with spontaneous recanalization.

At discharge, the patient showed no residual neurological deficits. Follow-up neurosonology showed improved MCA velocities, indicating vascular remodeling, and CT angiography confirmed 50-70% extracranial ICA stenosis (NASCET) with an intimal flap, reinforcing continued monitoring and dual antiplatelet therapy.

Discussion/Conclusion
Hypotension, atypical in acute stroke, together with insufficient collateral circulation due to ACA hypoplasia, contributed to the fluctuating neurological deficits. This case underscores the need for individualized management and highlights the role of neurosonology in perfusion monitoring and treatment decisions.

Keywords:
Autonomic Nervous System Diseases; Carotid Artery Dissection, Internal; Doppler Ultrasonography, Transcranial; Ischemic Stroke; Middle Cerebral Artery

A novel approach to Parkinson's disease management: subcutaneous infusion therapy – case report

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Introduction

Parkinson's disease (PD) is a chronic progressive neurodegenerative disorder caused by the neuron degeneration in the substantia nigra, resulting in dopamine deficiency. For years, the primary treatment has been the same—levodopa. Although unchanged, its administration has evolved from intermittent oral administration to the latest continuous subcutaneous pump, indicated for advanced Parkinson's patients with severe motor fluctuations and dyskinesia, unresponsive to other therapies. This case report presents one of the first patients at Clinical Hospital Center Rijeka to receive foslevodopa/foscarbidopa via a subcutaneous pump.

Case Report

A 67-year-old female patient was diagnosed with PD in 2019, when she presented with left-sided rigidity, gait disturbances and tremor. Over time, symptoms gradually progressed, eventually affecting the right side as well. Due to inadequate symptom control with oral levodopa and after thorough evaluation, she was deemed a candidate for the subcutaneous foslevodopa/foscarbidopa pump. In 2024, she was admitted to the Clinic for pump placement, after which she was prescribed the following medication doses: a bolus dose of 0.6 mL, a continuous dose of 0.20 mL, a nighttime dose of 0.16 mL and an additional dose of 0.15 mL, with instructions to reload the pump every 24 hours. During her hospitalization, a detailed clinical assessment for PD was conducted, including the Unified PD Rating Scale (UPDRS). She received a score of 5 on the UPDRS IV scale, which evaluates the motor complications. At her three-month follow-up, the score improved to 2, with better symptom control, less "off" time and better quality of life.

Discussion/Conclusion

A subcutaneous pump represents a significant advancement in the treatment of PD, particularly for patients with motor complications, while avoiding the more invasive approach used with the intrajejunal pumps. The continuous medication delivery enables more stable symptom control, reducing "off" periods and dyskinesias, thereby enhancing patients' quality of life.

Keywords:

Carbidopa; levodopa; neurodegenerative disease; Parkinson's disease, subcutaneous infusion

Epilepsy resistant to therapy as the first sign of CLN2 – the importance of early diagnosis

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Introduction

Neuronal ceroid lipofuscinosis (NCL) is a group of rare, progressive neurodegenerative disorders that fall under the category of lysosomal storage diseases. They are caused by mutations in various genes (e.g. CLN1, CLN2, CLN3, etc.), which leads to the pathological accumulation of autofluorescent lipopigments (ceroid and lipofuscin) in neurons and other cells. The paper aims to emphasize resistant epilepsy as one of the early signs of neuronal ceroid lipofuscinosis and underline the importance of early detection to improve the patient's response to therapy and quality of life.

Case Report

A 2-year-and-11-month-old girl was hospitalized due to recurrent convulsive seizures. The EEG findings indicated focal changes with bilateral propagation, for which a diagnosis of focal epilepsy was made and treatment with anticonvulsants was started, but the seizures persisted. Also, despite the adjustment of anticonvulsant therapy, seizures recurred, requiring repeated hospitalizations. The brain MRI revealed a small parenchymal calcification in the right temporal area (4 mm). The appearance of the remaining cerebrum, cerebellum, and brainstem was normal. The ventricular system was of normal size and appropriately filled, while the subarachnoid spaces were of adequate dimensions, with no signs of recent ischemia, hemorrhage, or expansive processes. The midline structures and craniocervical junction showed no abnormalities in their morphology. Based on the patient's symptoms and the results of the performed investigations, the differential diagnoses included: progressive myoclonic epilepsies, neurodegenerative disorders such as GM2 gangliosidosis, infectious or post- infectious causes such as chronic viral encephalitis or post-encephalitic epilepsy. To narrow down the diagnostic possibilities and determine the exact underlying cause, genetic analysis was initiated, which confirmed a compound heterozygous mutation in the tripeptidyl peptidase 1 (TPP1) gene, establishing the diagnosis of neuronal ceroid lipofuscinosis type 2 (CLN2). After a conciliar decision, enzyme replacement therapy with cerliponase alfa (Brineura) was finally introduced. Following the initiation of therapy, the patient has shown significant improvement, responding well to treatment and remaining free of recurrent epileptic seizures.

Discussion/Conclusion

This paper emphasizes the importance of early identification and diagnosis of neuronal ceroid lipofuscinosis type 2 (CLN2) in pediatric patients, particularly those with therapy-resistant epileptic seizures. Early detection allows for the timely initiation of enzyme replacement therapy, which can help slow disease progression and improve the overall quality of life. In contrast, delayed diagnosis and treatment are often associated with more advanced neurodegeneration, reduced treatment effectiveness, and poorer outcomes, highlighting the critical need for prompt intervention.

Keywords:

Cerliponase alfa, epilepsy, Neuronal ceroid lipofuscinosis, seizures, TPP-1,

Infantile spasms and lissencephaly due to a previously unreported PAFAH1B1 mutation: Case report

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Introduction
Although epilepsy, epileptic encephalopathy and lissencephaly are well-known disorders, the case of our patient is the first of its kind. The newly discovered mutation in the patient's gene PAFAH1B1 is believed to be the underlying cause of the patient's condition.

Case Report
A 4-month-old male infant was brought to the hospital after exhibiting his first generalised motoric seizure. Physical examination upon admission revealed convergent strabismus, an enlarged anterior fontanelle, exhibited dyskinetic movements. Diagnostic procedures included brain ultrasound, computed tomography scan and magnetic resonance imaging, which revealed structural changes in the brain. The gyri displayed a thickened cortex and shallow sulci, indicative of lissencephaly, with ventriculomegaly and hypoplasia of the corpus callosum. The initial electroencephalogram revealed multifocal changes and valproic acid was introduced. A week later the electroencephalogram recorded hypsarrhythmia, and he started having seizures characteristic of West syndrome- epileptic spasms. Vigabatrin and topiramate were added to the therapy, with minimal improvement. He underwent pulse corticosteroid therapy with dexamethasone for three days. This resulted in cessation of spasms and significant improvement on the electroencephalogram. During the next 1.5 years the patient was seizure free but showed signs of markedly delayed psychomotor development and has generalised hypotonia. A genetic panel identified a mutation in the PAFAH1B1 gene, previously associated with isolated lissencephaly. This specific variant has not yet been described in population databases, but based on the clinical presentation, it is likely pathogenic.

Discussion/Conclusion
This case highlights a previously unreported PAFAH1B1 gene mutation potentially associated with lissencephaly and epileptic encephalopathy. The administered therapy managed to stop the spasms, but the neuroimaging findings and dysmorphic features suggest a potential syndromic presentation.

Keywords:
Epileptic Encephalopathy; Hypsarrhythmia; Infantile Spasms; Lissencephaly; PAFAH1B1 Protein,Human

Febrile neutropenia and sepsis in a patient with relapsing- remitting multiple sclerosis

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Introduction
Febrile neutropenia is a medical condition characterized by a fever and a low neutrophil count in the blood. It often results from bone marrow disorders, certain infections, or the use of immunosuppressive drugs (such as ocrelizumab). In relapsing-remitting multiple sclerosis, ocrelizumab treatment plays a key role in improving the condition. As an immunosuppressive drug, ocrelizumab targets the anti-CD20 markers on B lymphocytes, which helps reduce the immune response by preventing these cells from attacking and damaging myelin.

Case Report
A 60-year-old female was admitted through the Emergency Department due to the clinical presentation of neutropenic sepsis and septic shock of unknown origin, with associated acute renal failure, following the 7th cycle of ocrelizumab administration nine months prior. Upon admission, the patient presented with somnolence, hypotension (blood pressure 70/60), normal cardiac function, eupnea, and fever. It was known that the patient had been diagnosed with relapsing-remitting multiple sclerosis since 2016, which had been treated with ocrelizumab. In 2020, a brain and cervical spine magnetic resonance imaging (MRI) was performed, revealing regression of demyelinating lesions located both supratentorially and infratentorially in the right middle cerebellar peduncle, along with one new small cervical lesion. Laboratory results showed elevated C-reactive protein (52.9), urea (25.1), creatinine (551), and a low neutrophil count (19.8), along with an IgG titer of 2.71. A blood culture was collected and subsequently confirmed to be Pseudomonas aeruginosa. The patient received volume replacement with crystalloid solutions, empirical antibiotic therapy with piperacillin-tazobactam, and vasopressor support with noradrenaline. These therapeutic interventions improved the patient's condition, normalized blood pressure, and restored kidney function."

Discussion/Conclusion
Although the specific frequency of agranulocytosis is unknown, it is estimated to be 1.0 to 3.4 cases per million people annually. An infrequent side effect of ocrelizumab is febrile neutropenia. The patient's relapsing-remitting multiple sclerosis itself only contributed to this condition, so ocrelizumab treatment was discontinued. Further hematologic and immunologic workup was planned and conducted before deciding on an alternative therapy to replace ocrelizumab in this patient, even though the specific replacement therapy is yet to be determined.

Keywords:
Fever, multiple sclerosis, neutropenia, ocrelizumab, shock

Life-threatening tension pneumocephalus after the neurosurgical evacuation of bilateral subdural hygromas

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Introduction

Pneumocephalus is a common complication following neurosurgical procedures, often asymptomatic and managed conservatively. Tension pneumocephalus arises when the intracranial air pressure exceeds atmospheric causing brain compression and constituting a neurosurgical emergency, frequently identified on computed tomography (CT) scans by the "Mount Fuji" sign.

Case Report

This case report details the clinical course of a 65-year-old patient whose postoperative recovery following the neurosurgical evacuation of bilateral subdural hygromas was complicated with pneumocephalus. The patient initially presented with an epileptic seizure following head trauma. CT scan revealed 15 mm bilateral frontotemporoparietal hygromas with adjacent brain compression. The patient underwent bilateral parietal trepanation, hygroma evacuation, and intraoperative subdural drainage placement, with no immediate postoperative neurological deficits. However, on the first postoperative day, the patient's Glasgow Coma Scale (GSC) dropped from 15 to 10, and a follow-up CT scan revealed significant bilateral pneumocephalus. Urgent surgical intervention, bilateral frontal trepanation with subdural lavage and placement of a ventricular catheter in the subdural space, was performed. Postoperatively, the patient demonstrated stable neurological function. Control CT scans at three and five weeks post-discharge showed right-sided hygroma enlargement (30mm) with 7.5 mm midline shift, prompting reoperation per guidelines. Post- drain removal CT showed hygroma regression, but a follow-up scan two weeks later revealed left-sided subdural collection progression. Given the patient's stable neurological condition, with no headache or nausea, conservative management was continued. CT scan performed three weeks later showed regression of the subdural collections, and the patient was referred for ongoing conservative treatment.

Discussion/Conclusion

Tension pneumocephalus is often underrecognized and is potentially life-threatening condition. Prompt diagnosis, confirmed through CT imaging, is critical, as delays in treatment may lead to adverse neurological outcomes and increased mortality. Currently, no definitive treatment guidelines for tension pneumocephalus are available in the literature, making the reporting of cases such as this one particularly valuable.

Keywords:

complications, craniocerebral trauma, hematoma, neurosurgery

From seizures to hemispherotomy: the complex course of Rasmussen's encephalitis

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Introduction

Rasmussen's encephalitis is a rare disorder primarily affecting children and young adults. It is characterized by unilateral cerebral cortex inflammation, drug-resistant epilepsy, and progressive cognitive deterioration. Although the exact etiology remains unknown, an immune-mediated mechanism has been proposed.

Case Report

A previously healthy 7-year-old boy presented to the emergency department with abdominal pain, vomiting, and prior events suggestive of seizures. EEG showed continuous focal discharges. After ten days of hospitalization and multiple seizures, he was finally stabilized with ceftriaxone, acyclovir, and antiedematous therapy. He was discharged home on carbamazepine therapy. Despite regular treatment, seizures persisted daily, lasting about one minute and characterized by staring, loss of muscle tone, and collapse without convulsions, followed by postictal drowsiness and retrograde amnesia. EEG findings, concordant with semiology, suggested a frontal lobe seizure origin. Over the next three years and through numerous hospitalizations, various antiepileptic agents were combined without improvement, leading to a diagnosis of pharmacoresistant epilepsy. Seizure frequency increased to up to ten episodes per day, prompting further investigations that raised suspicion of autoimmune encephalitis. Treatment with corticosteroids and intravenous immunoglobulins was initiated, but significant improvement occurred only after plasmapheresis and cyclophosphamide administration. A follow-up brain MRI revealed hemispheric atrophy, and the patient developed rapid cognitive deterioration, leading to suspicion of Rasmussen's syndrome and ultimately a definitive diagnosis based on established criteria. Immunosuppressive therapy and oral corticosteroids were introduced alongside antiepileptics. There was still no clinical improvement, and at the age of eleven, the patient underwent right hemispherotomy. Postoperatively, he developed left-sided spastic hemiparesis, hemianopsia, and a mood disorder but remained seizure-free without antiepileptic drugs.

Discussion/Conclusion

In young patients with pharmacoresistant epilepsy, rare diagnoses like Rasmussen's encephalitis should be considered. Since no optimized therapy exists, multidisciplinary discussion, including the family, is essential to weigh the risks and benefits of surgical and pharmacological treatment.

Keywords:

Autoimmune encephalitis, Hemiparesis, Hemispherotomy, Pharmacoresistant epilepsy, Rasmussen's encephalitis

From inconclusive imaging to curative surgery: The role of SEEG in refractory epilepsy

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Introduction
Pharmacoresistant epilepsy, frequently MRI-negative, presents a complex challenge in diagnosis and treatment, requiring advanced techniques like intracranial EEG to localize epileptogenic foci and guide therapeutic intervention.

Case Report
A 52-year-old male patient with a lifelong history of pharmacoresistant epilepsy was presented at the neurosurgical board. His seizures began at six months of age, occurring multiple times daily, severely impairing his quality of life. The high seizure burden had led to numerous secondary injuries, including multiple fractures of the extremities. Despite extensive pharmacological management with 12 different antiepileptic drugs over time, seizure control remained unattainable. The patient's seizure semiology was characterized by autonomic manifestations, behavioral arrest, gustatory automatisms, hypersalivation, auditory auras, and altered body perception. Non-invasive diagnostic workup revealed discordant findings: MRI and PET imaging suggested a left- sided epileptogenic focus within the parietal and temporal lobes, whereas video EEG pointed to seizure onset in the right perisylvian region, posterior cingulate cortex, mesial and lateral temporal lobes, and posterior insula, favoring a right hemispheric origin. Given this incongruity, invasive intracranial EEG was deemed necessary.

Eleven stereoelectroencephalography (SEEG) depth electrodes were implanted to cover all suspected epileptogenic zones. SEEG monitoring, combined with subsequent video EEG analysis, confirmed a seizure onset zone within the right temporal lobe, specifically involving the hippocampus and amygdala. Based on these findings, the patient underwent a right-sided selective amygdalohippocampectomy. At the one-year postoperative follow-up, the patient was classified as Engel Class II. At the most recent evaluation, he achieved Engel Class I status, demonstrating complete seizure freedom.

Discussion/Conclusion
In cases where non-invasive diagnostic modalities yield discordant results, invasive SEEG becomes an indispensable tool for accurate epileptogenic focus localization. By offering precise mapping of ictal onset zones, SEEG enables tailored neurosurgical intervention, laying the foundation for curative resective surgery and providing potential for sustained seizure freedom and significant improvement in quality of life.

Keywords:
Epilepsy, Drug-Resistant; Intracranial EEG; Temporal Lobe Epilepsy

Differentiating Frontotemporal Dementia from Bipolar Disorder in Elderly Patients: A Case Report

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Introduction
Frontotemporal dementia (FTD) is a neurodegenerative disorder which is often very challenging to treat, particularly when its symptoms overlap with other psychiatric conditions. Clinical presentation of FTD frequently mimics bipolar disorder (BD), leading to significant diagnostic difficulties. Many symptoms overlap between the two conditions; mood disturbances, behavioral disinhibition, social inappropriateness, impulsivity and lack of insight make differentiation quite challenging, especially in older patients.

Case Report
A 71-year-old male with no prior psychiatric history presented with cognitive impairment, mood disturbances, unusual behavior and disinhibition. His family reported that he had always exhibited eccentric behavior but refused medical attention. His symptoms had gradually worsened, demanding psychiatric evaluation and treatment because of difficulties in managing daily tasks and poor judgment. A CT scan showed frontal and temporal lobe atrophy. Following a comprehensive psychiatric assessment, a diagnosis of frontotemporal dementia was established; however, bipolar disorder could not be entirely ruled out due to the patient's long-standing atypical behavior. Fortunately, both conditions share overlapping treatment approaches, allowing for a similar therapeutic approach.

Discussion/Conclusion
This case illustrates the complexity of distinguishing between FTD and BD in older patients. The presence of long-standing but untreated behavioral peculiarities, combined with later-life cognitive impairment presents a significant diagnostic challenge in distinguishing between FTD and BD. Comprehensive clinical, neuropsychological, and neuroimaging evaluation are of utmost importance to ensure accurate diagnosis and appropriate management.

Keywords:
Bipolar Disorder, Cognitive Symptoms, Frontotemporal Dementia, Misdiagnosis, Neuroimaging

Sunday – April 13th
Student Session 4

Challenges in the surgical excision of orbital cavernoma: a case report

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Introduction
Orbital hemangioma is a rare vascular tumor, accounting for 5-9% of orbital neoplasms. This tumor typically presents during adulthood, often with symptoms like proptosis and visual disturbances. Surgical intervention is usually required for symptomatic cases.

Case Report
An 18-year-old female presented with a history of left-sided exophthalmus since early childhood, without any significant neurological deficits. A head MRI revealed a 2.2 x 1 cm tumor located medially within the left intraorbital region, which caused bulbar proptosis and craniolateral dislocation of the left optic nerve. Given the location and nature of the tumor, the patient underwent surgery with the assistance of a maxillofacial surgeon. A bicoronal incision was made, followed by an orbitofrontal craniotomy. The goal was to perform an en bloc excision of the hrmangioma while sparing the oculomotor muscles and the optic nerve. Postoperatively, she did not exhibit any neurological deficits and postoperative MRI confirmed the successful en bloc excision. The patient was discharged after a five-day hospital stay without complications. At the two-month follow-up, a new MRI demonstrated significant regression of the proptosis.

Discussion/Conclusion
Orbital cavernous hemangiomas typically affect women aged 20 to 60, with this patient being younger than the typical age range. Surgical approaches for orbital cavernoma remain debated in the literature. Lesions located near the orbital apex are generally approached transcranially, as shown in this case, while those positioned anteriorly are accessed transconjunctivally. Adapting the surgical approach based on the lesion's proximity to the optic nerve can significantly impact the outcome. The main complication of orbital cavernoma surgery is blindness, caused by optic nerve damage, traction, or vascular disruption. Other risks include palpebral ptosis and impaired ocular motility from injury to the extraocular muscles. This case highlights the importance of careful surgical planning and interdisciplinary approach needed to avoid complications and to achieve favorable outcomes in orbital cavernoma cases.

Keywords:
brain cavernous hemangioma, neurosurgical procedure, orbital neoplasms

Surgical Treatment of Chiari 1 Malformation in a Child Presenting with Tremor

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Introduction
Chiari 1 malformation is the most common type of Chiari malformation. It is characterized by caudal descent of cerebellar tonsils through the foramen magnum, often accompanied by syringomyelia. It may remain asymptomatic, be incidentally discovered on brain MRI, or manifest in late childhood or adolescence with headaches and focal neurological deficits. Tremor as a symptom of Chiari 1 malformation occurs in 0.2% of cases, and this was the only case among children followed at the Children's Hospital Zagreb.

Case Report
An 8-year-old female patient presented with months-long occipital headaches. Her personal medical history revealed an uneventful pregnancy and full-term birth with normal psychomotor development. There were no significant findings in the family history. During the second grade of elementary school, the girl developed a tremor in the index finger of her right hand, significantly impairing her ability to write. This new neurological symptom indicated brain magnetic resonance imaging (MRI), which revealed cerebellar tonsillar descent. She was afterward placed under the care of a neurosurgeon for further monitoring. Throughout the second grade, she frequently missed school and experienced one episode of loss of consciousness. Her tremor worsened to the extent that she could not write, and it was observed that the tremor was absent during sleep, with the girl clenching her hand while asleep. Due to the significant functional impairment, she underwent posterior fossa decompression, which includes a 3x3 cm craniectomy, C1 laminectomy, Y-shaped durotomy, and watertight closure using autologous pericranium sutured with Prolene 4-0. Postoperatively, she had an excellent recovery with complete resolution of tremor and headaches. Over several years of follow-up, the girl successfully completed the third grade of elementary school, and her hand function remained normal.

Discussion/Conclusion
This case highlights the rare presentation of Chiari 1 malformation with tremor and the importance of recognizing it as a possible symptom. The complete resolution of tremor after surgery confirmed its etiology, excluding other potential causes such as essential tremor, dystonia, or Wilson's disease.

Keywords:
Chiari Malformation Type I; Headache; Magnetic Resonance Imaging; Tremor

Management of Fusiform Aneurysm of the Right Posterior Inferior Cerebellar Artery

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Introduction
Fusiform aneurysms of the posterior inferior cerebellar artery (PICA) are rare vascular pathologies with complex clinical presentations. This case highlights the diagnostic and surgical challenges in managing a patient with coexisting demyelinating and vascular pathologies.

Case Report
A 31-year-old female patient was evaluated via emergency neurological services due to paresthesias in the extremities and trunk up to the Th4 level, persisting for months, raising suspicion of a demyelinating disease, particularly multiple sclerosis. The patient received pulse corticosteroid therapy. Initial CT imaging of the brain revealed an intradural lesion at the craniocervical junction of uncertain etiology. Further workup with MRI and angiography confirmed a fusiform aneurysm of the right PICA, with aneurysmal changes involving the entire vessel circumference. Additionally, a cervical medullary lesion suspicious for demyelination was identified, and cerebrospinal fluid analysis demonstrated the presence of oligoclonal bands. The patient was admitted to the Department of Neurosurgery for the surgical management of the clinically and neuroradiologically verified fusiform aneurysm of the right PICA. A surgical procedure under endotracheal anesthesia was performed, involving trapping and excision of the aneurysm, effectively excluding it from circulation. Blood flow was successfully restored via termino-terminal anastomosis. On the first postoperative day, digital subtraction angiography confirmed a satisfactory postoperative vascular status. The patient's hospital stay was uneventful, and she was discharged home in stable condition for further recovery.

Discussion/Conclusion
The successful management of this case highlights the importance of advanced neuroimaging, timely surgery, and interdisciplinary collaboration in achieving optimal outcomes. While most posterior circulation aneurysms are treated endovascularly, using methods such as stand-alone coiling, stent-assisted coiling, microcatheter-assisted coiling, flow diversion, or parent artery occlusion with coils, the accessibility of this aneurysm allowed for successful excision and revascularization. This surgical approach is rarely performed in Croatia and is currently only conducted at the University Hospital Center of Zagreb.

Keywords:
Anastomosis; Demyelination; Fusiform Aneurysm; Neurosurgery; Paresthesias

Refining subarachnoid hemorrhage severity grading: The role of anesthesia recovery times in animal perforation model

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Introduction
Subarachnoid hemorrhage (SAH) is commonly studied in animal models using the endovascular perforation model to mimic aneurysmal rupture, the leading cause of SAH in humans. Inhalation anesthesia may influence SAH severity, yet its impact remains unclear. This study investigates whether anesthesia duration affects recovery times (RTs) based on neurological reflexes and explores its potential as a predictor of SAH severity. Traditional grading methods, based on blood volume assessment or MRI, have limitations—subjectivity and cost, respectively. We investigate whether recovery of key neurological reflexes could serve SAH severity evaluation.

Materials and Methods
Thirty-four Sprague Dawley rats underwent endovascular perforation under Isofuran anesthesia (3% in O_2/air, 1:3, endotracheally). Recovery times (RTs) for pain, respiration, and consciousness were recorded. Neurological outcomes were assessed using the modified Garcia score 4 hours post-procedure, followed by euthanasia for conventional SAH grading. In total, 54 rats were used: 34 in the SAH group, 17 as negative controls to assess anesthesia effects, and 3 excluded due to early death or missing data. Correlations between consciousness RTs, SAH grade, and neurological scores were analyzed. RTs in negative controls were compared across anesthesia durations. Statistical analysis was performed using GraphPad Prism.

Results
A significant correlation was found between consciousness recovery time and SAH severity according to conventional grading (Spearman r = 0.55, p = 0.0022) and between consciousness recovery time and neurological scores (Spearman r = 0.59, p = 0.001). Rats with severe SAH exhibited prolonged recovery times for all neurological reflexes compared to the sham group (one-way ANOVA test). No significant differences were observed in the negative control RTs, suggesting that anesthesia did not impact recovery times (Kruskal-Wallis test).

Discussion/Conclusion
Consciousness recovery time may be a practical indicator of SAH severity, though further validation is needed, especially due to the limited distinction between moderate and severe cases. Anesthesia duration had no significant effect on recovery times, indicating that variations in recovery are primarily due to SAH severity rather than anesthesia exposure, but more molecular experiments need to be done for validation.

Keywords:
Anesthesia recovery time, endovascular perforation model, rats, Sprague-Dawley, Subarachnoid hemorrhage

Neurological and Psychiatric Overlap in Multiple Sclerosis

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Introduction

Relapsing-remitting multiple sclerosis is a chronic demyelinating disease of the central nervous system, marked by recurrent episodes of neurological dysfunction followed by partial or complete remission. The pathophysiology involves inflammatory demyelination and axonal injury, leading to diverse clinical manifestations. The interaction between psychiatric and neurological symptoms in relapsing-remitting multiple sclerosis complicates both diagnosis and management, necessitating a multidisciplinary approach.

Case Report

A 46-year-old female was admitted to the Neurology Clinic with dysphagia, dysarthria, bilateral internuclear ophthalmoplegia, and left-sided limb weakness persisting for three days. An urgent computed tomography scan of the brain revealed no acute pathological findings. She exhibited psychomotor retardation, amimia, and difficulty swallowing. Her history includes long-term psychiatric follow-up for depression and anxiety disorders. Magnetic resonance imaging revealed over 70 hyperintense lesions on T2 fluid-attenuated inversion recovery sequences, consistent with multiple sclerosis. Collateral history revealed that, over the past month, the patient experienced episodes of confusion, restlessness, poor adherence to therapy, agitation, verbal aggression, and coprolalia following abrupt diazepam discontinuation. Her speech was dysphonic and dysarthric, impairing comprehension. Following evaluation, pulse corticosteroid therapy was initiated. Neuropsychological assessment revealed organic cognitive dysfunction, including impaired thought organization, recall, and expressive speech, likely due to central nervous system lesions and benzodiazepine withdrawal. Neuroimaging and cerebrospinal fluid analysis demonstrate dissemination in space and time, with positive oligoclonal IgG bands and demyelinating lesions, fulfilling the diagnostic criteria for relapsing-remitting multiple sclerosis.

Discussion/Conclusion

Initially mimicking an acute cerebrovascular event, this case posed diagnostic and therapeutic challenges. Symptom etiology remained unclear—whether due to corticosteroids, diazepam withdrawal, or extensive demyelination. The patient was prescribed pantoprazole, diazepam, risperidone, and biperiden, requiring strict supervision. A 21-day inpatient rehabilitation was indicated, with psychiatric follow-up and referral for neurological monitoring. Recognizing multiple sclerosis relapses is challenging with overlapping psychiatric and withdrawal symptoms. Careful evaluation and multidisciplinary care are essential for optimal outcomes.

Keywords:

Corticosteroids, Magnetic Resonance Imaging, Multiple Sclerosis, Relapsing-Remitting, Withdrawal Syndrome

Student Session 5

Duodopa pump: Invasive treatment for advanced Parkinson's disease

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Introduction

Parkinson’s disease (PD) is a progressive neurodegenerative disorder characterized by tremors and bradykinesia, resulting from the loss of dopamine-producing neurons in the brain's substantia nigra region. Due to this loss, the treatment aims to either increase dopamine levels or mimic its effects. Initial treatment typically involves oral medications such as levodopa, but if these prove ineffective or have significant side effects, invasive treatment options like the Duodopa pump can be used. This system delivers a controlled and steady dose of levodopa directly to the small intestine via permanent Percutaneous Endoscopic Gastrostomy (PEG) tube.

Case Report

A 69-year-old male patient presented in 2006 with pain and stiffness in the left extremities. Over time, he developed left-hand tremors and bradykinesia, causing progressive difficulties with daily activities. Subsequently, he was diagnosed with PD and started on Rasagiline.

Nevertheless, his symptoms progressed, eventually also affecting his right extremities. This progression required adjustments to his treatment regimen, which was expanded to include Rasagiline, Ropinirole, and Levodopa/Carbidopa. The adjusted therapy provided temporary symptom relief, however, motor complications, such as wearing off and unpredictable off, eventually appeared. As a result, in 2023 the decision was made to initiate invasive treatment with a Duodopa pump. Firstly, a nasogastric/nasojejunal tube was inserted for drug testing, and a favorable clinical response without side effects was observed. Consequently, a PEG/PEJ tube was placed, and Duodopa intestinal gel administered as follows: morning dose 4.0 mL, evening dose 1.5 mL, and bolus dose 1.0 mL. As a result, the symptoms of the underlying condition have been effectively managed to date.

Discussion/Conclusion

In conclusion, this case highlights the progression of PD and the eventual shift to invasive treatment with the Duodopa pump. The use of continuous intestinal levodopa infusion effectively managed symptoms, providing relief and improving quality of life for the patient, with no adverse effects observed.

Keywords:

Carbidopa; Invasive Procedures; Levodopa; Neurodegenerative Diseases; Parkinson Disease

“Houston, we have a problem!” – is it really multiple sclerosis?

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Introduction
Multiple sclerosis (MS), known as “disease with a thousand faces”, is a chronic autoimmune demyelination disorder of the central nervous system, which mostly affects women and leads to physical and cognitive impairment. Inflammation leads to myelin and axon injury, affecting brain, spinal cord and mostly optic nerve.

Case Report
A 52-years-old male presented to a neurologist with loss of balance and coordination problems. Neurological status was confirmed through anamnesis and high score of expanded disability status scale (EDSS) of 6.5. Evaluation of cerebrospinal fluid (CSF), magnetic resonance imaging (MRI) and visual evoked potentials (VEP)) verified diagnosis of MS -primary progressive phenotype. Specific therapy slowed disease progression for two years. Suddenly, over the course of one month, he developed weakness of the lower extremities with sensory loss, along with weight loss, without pain or trauma. Shortly after, he became completely paraplegic with no response to pulse corticosteroid therapy. MRI of the brain and cervical spine was stable, while thoracic spine MRI revealed a new active lesion with diffuse Th2 vertebra infiltration, a pathological fracture and spinal canal stenosis. But, on chest X-ray, suspicion lesion on the right 7th rib suggested malignant process. Targeted MRI and CT confirmed a malignant process described as metastases in the T2 – T4 vertebrae with infiltration of the spinal canal.

Surgical decompression improved movement of the lower extremities and increased EDSS to 5. Pathological finding surprisingly, revealed plasmacytoma – multiple myeloma with free light chain kappa without positive Bence-Jones proteins.

Specific hematologic therapy was continued, along with autologous stem cell transplantation.

Discussion/Conclusion
MS is diagnostically challenging as it can mimic other disorders, and vice versa, so the diagnosis was made 3 days after the onset of paraplegia. Paraclinical findings (CSF, VEP, MRI) help us lead to the right diagnosis, but misinterpretation of MRI is the most common reason for misdiagnosis.

Keywords:
Demyelinating Diseases, Differential diagnosis, Missdiagnosis, Multiple Sclerosis

Drug-resistant Mesial Temporal Lobe Epilepsy treated with Amygdalohippocampectomy

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Introduction
Mesial temporal lobe epilepsy (MTLE) is the most common form of focal epilepsy, often associated with hippocampal sclerosis (HS). Patients with MTLE frequently present with drug- resistant seizures. Surgical intervention can be an effective treatment option for carefully selected cases, with good long-term outcome rates of 60-70% sustained seizure freedom and a low rate of adverse side effects.

Case Report
An 18-year-old female patient experienced her first epileptic seizure at the age of eight. Seizures were clinically presented as focal autonomic seizures with impaired awareness - seizure semiology included epigastric aura, early non-forced right head-turning, automatisms of the right hand, and postictal preserved speech that suggested a right mesiotemporal origin. Over the years, she was treated with multiple antiseizure medications (ASMs), in monotherapy or polytherapy. Still, seizures remained refractory, often occurring several times per week, sometimes with evolution to bilateral tonic-clonic seizures. Magnetic resonance imaging (MRI) performed in 2021 revealed right-sided hippocampal atrophy with increased T2 signal, consistent with HS. Continuous video-electroencephalography (EEG) monitoring recorded several seizures with clear right mesiotemporal seizure onset. Positron emission tomography/ computed tomography (PET/CT) demonstrated hypometabolism in the right temporal lobe. Neuropsychological assessment was normal. Given the pharmacoresistant nature of the epilepsy and the anatomoclinical correlation, after multidisciplinary evaluation, she underwent selective right amygdalohippocampectomy in January 2022. Histopathology confirmed hippocampal sclerosis type 1. Postoperatively, her condition significantly improved, and since then, she has been seizure-free. The patient remains on levetiracetam and oxcarbazepine, with well- maintained therapeutic levels. Her neurological and cognitive function is stable, and she continues her university studies.

Discussion/Conclusion
This case highlights the importance of early recognition and appropriate management of drug-resistant MTLE. While pharmacological therapy is first-line, surgical intervention remains a crucial option for selected patients.

Keywords:
Anticonvulsants; Drug Resistant Epilepsy; Electroencephalography; Hippocampal Sclerosis; Temporal Lobe Epilepsy

Etiology of aseptic meningitis /encephalitis in Croatia, 2024: preliminary results

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Introduction

Aseptic meningitis and encephalitis are prevalent inflammatory central nervous system (CNS) diseases. The etiology and epidemiology vary according to the age group affected, geographic region, and immune status of affected individuals. This study analyzed the etiology of neuroinvasive diseases in adult patients in Croatia in 2024.

Materials and Methods

A total of 146 hospitalized patients aged 18-86 years from continental (n=126) and coastal (n=20) Croatian counties were included. Etiology was confirmed by the detection of DNA/RNA in the cerebrospinal fluid (CSF) and/or urine samples using PCR/RT-PCR or specific IgM/IgG antibodies in CSF and/or serum samples using enzyme immunoassay (ELISA), indirect immunofluorescence assay (IFA) or virus neutralization test (VNT).

Results

Neuroinvasive disease etiology was confirmed in 33 (22.6%) patients. West Nile virus (WNV) was the most common cause, detected in 17 (11.6%) patients from continental Croatia with a seasonal distribution (August-October). Tick-borne encephalitis virus (TBEV) was confirmed in 9 (6.2%) patients during April-November. Sporadic TBEV infections were recorded in continental regions with a small cluster in the Gorski Kotar. Usutu virus (USUV) was detected in 4 (2.7%) patients from Zagreb and the surrounding area in June and September. In addition, individual cases (0.6% each) were identified for Toscana virus (TOSV), Borrelia burgdorferi s.l., and enteroviruses (EV). The median age of patients with WNV and TBEV was 63 (IQR=55- 72) years and 60 (IQR=38-72) years, respectively. Patients with USUV infection aged 47-86 years. Patients with TBEV presented mainly with meningitis (66.6%), while in patients with WNV, the frequency of meningitis was 47.1% and meningoencephalitis 52.9%.

Discussion/Conclusion

The presented results highlight the emerging role of arboviruses in the etiology of neuroinvasive diseases in the adult population. Determining the etiology of aseptic meningitis/encephalitis is crucial for the appropriate treatment of infections for which therapy is available, such as neuroborreliosis, herpes simplex, and varicella-zoster CNS infections.

Keywords:

Encephalitis, Meningitis, Tick-borne encephalitis virus, Usutu virus, West Nile virus

Sunday – April 13th
Plenary lecture 8

Deep brain stimulation in movement disorders – state of art and future perspectives

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Deep brain stimulation (DBS) is the most important therapeutic innovation in movement disorders (MD). It involves using a pacemaker-like device (neurostimulator) to deliver high-frequency electrical stimulation to target areas within the brain. DBS saga started in 1987. in Grenoble with first implantation of device in PD patient and publishing the paper. Eventually DBS has becomes the lead operating method for treatment of the advanced and medically refractory MD. The most often use is in Parkinson's disease (PD), disabling dystonia, and tremors. When compared with medical treatment alone, controlled studies have shown better motor, nonmotor, and particularly quality-of-life outcomes in most of the MD. Story of Deep Brain Stimulation (DBS) is a great example of the interplay between basic and clinical science. Novel indications and targets places like Tourette syndrome, obsessive compulsive disorder and other are investigating. Experiments using animals mostly monkeys and experimental DBS are used to evaluate new indications, targets, technology. Novel way of stimulation (close loop system) is also something that started. New advanced programming methods, response to local field potential power spectra, improved battery life, recharging capacity or energy harvesting, neuroimaging advances to improve targeting and programing are helpful. In conclusion, the development of DBS demonstrates that translational research can be used to explore new indications in MD, better technics and targets and improve outcome and safety of implementations in humans. It also shows that clinically relevant questions can be answered by DBS in animal models. DBS has become a safe, effective and important therapy in the treatment of movement disorders with carefully selected patients and adequatelytrained team of neurologists and neurosurgeons and our results are comparable with other DBS centers in the world.

Plenary lecture 9

From Waistline to Brain: Exploring How Obesity and Sex Influence Insulin Resistance in Type 2 Diabetes

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Obesity is a risk factor for a range of conditions, from cardiovascular diseases to tumors and neurodegenerative disorders. Its development is influenced by various obesogens, but in animal models, diet serves as a sufficient inducer. The classical perspective on the pathogenesis of obesity posits that inflammation in adipose tissue triggers all subsequent processes that ultimately lead to the loss of pancreatic beta-cell function and peripheral insulin resistance. Potentially, diet-induced overeating serves as a behavioural indicator of insulin resistance in satiety centres. Insulin sensitizers, such as metformin, when applied early alongside dietary interventions, may affect central resistance and prevent the development of diabetes.

In a study involving four groups of middle-aged male and female Sprague-Dawley rats (aged 45 weeks), obesity was induced through a long-term diet (18 weeks) high in fats and sucrose. One control group was fed a standard diet (StD), one group received a high-fat high-sugar diet (HFHSD), and two groups were given the HFHSD along with long-term treatment of either metformin (HFHSD+M) or liraglutide (HFHSD+L). Antidiabetic treatment commenced five weeks after the introduction of the diet and lasted for 13 weeks until the animals reached 64 weeks of age. Although the HFHSD successfully induced obesity in young animals, this was not observed in the middle-aged group. Despite no gain in body weight, the surface area of adipocytes increased in the HFHSD and HFHSD+M groups, but not in the liraglutide-treated animals. Concurrently, glucose tolerance (GTT) deteriorated; the worsening of GTT was also noted in StD females, likely due to entering reproductive senescence. Furthermore, GTT deterioration and insulin resistance also occurred in liraglutide-treated animals, particularly in females, which developed all signs of type 2 diabetes (hyperphagia). The finding of low insulin receptor expression in the lateral hypothalamus of HFHSD+L females confirmed their central insulin resistance as a basis for hyperphagia, while peripheral hyperinsulinemia and hyperglycemia provided evidence of peripheral insulin resistance. The trigger for diabetes in these females was likely hyperinsulinemia, which acts as a mechanism for the anti-obesity effects of Glucagon-like peptide-1 (GLP-1) inhibitors.

In conclusion, none of the applied antidiabetic treatments prevented the development of diabetes; in fact, they exacerbated its occurrence when combined with HFHSD. The lean phenotype of females on liraglutide (loss of visceral fat) was accompanied by overall starvation and loss of both energy stores in the liver. Sex-specific differences in responses to diet and antidiabetic treatments underscore the need for personalized therapeutic approaches based on sex. The loss of visceral fat in middle age should be viewed in the context of all other metabolic changes and should not be favoured as a desired treatment outcome.

Student Session 6

Western Blot Analysis of Cathepsin B in Brain Tissue and Neural Cells: Towards Biomarker Research

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Introduction
Cathepsin B is a cysteine protease primarily located in lysosomes of many tissues but can also be secreted extracellularly. In nervous tissue, cathepsin B plays roles in both physiological processes, such as synaptic remodelling and axon guidance, and pathological processes, including neuroinflammation and neurodegeneration. This study aims to establish a western blot analysis for detecting cathepsin B in brain tissue and neural cells, facilitating further studies on its presence in human cerebrospinal fluid (CSF).

Materials and Methods
Mouse brain tissue was isolated from a C57BL/6J mouse euthanised by CO2 aspiration and cervical dislocation, in accordance with institutional ethical guidelines. Proteins from mouse brain, SH-SY5Y (neuroblastoma) and U87 (microglia) human cells were extracted using lysis buffer, separated by denaturing electrophoresis, and transferred to a nitrocellulose membrane by wet transfer. Total proteins were visualised by Ponceau staining, while cathepsin B was detected using a commercial rabbit monoclonal antibody, with chemiluminescence signal captured digitally.

Results
Cathepsin B was detected in all three analysed samples as two distinct groups of signals: strong bands around 35 kDa and weaker bands around 40 kDa. However, the exact number and position of these bands varied between samples. The strong 35 kDa signals appeared as two distinct bands in mouse brain and SH-SY5Y cells, but as a single band in U87 cells. The weaker 40 kDa signals were observed as two bands in mouse brain, whereas only a single different sized band was present in both SH-SY5Y and U87 cells.

Discussion/Conclusion
Western blot successfully detected cathepsin B in mouse brain tissue and human neural cells (SH-SY5Y and U87), confirming the suitability of these protein sources as positive controls for future CSF studies. Given its potential involvement in both neurorecovery and neurodegeneration, CSF detection of cathepsin B may prove informative in conditions such as traumatic brain injury and multiple sclerosis.

Keywords:
Blotting, Western; Brain; Cathepsin B; Cell Line; Cysteine Proteases

Cadherins in Human Cerebrospinal Fluid After Severe Traumatic Brain Injury: Detection and Implications

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Introduction
Cadherins, a family of transmembrane proteins, play a vital role in the structure and function of synapses and the blood-brain barrier (BBB). In traumatic brain injury (sTBI), cadherins can be released from damaged tissue as a result of physical trauma. However, cadherins may also be upregulated during recovery to restore synapse and BBB integrity. The study aimed to determine whether cadherins are detectable in cerebrospinal fluid (CSF) from patients with sTBI. The findings may support the limited existing research on cadherins as biomarkers for injury severity and/or recovery.

Materials and Methods
The study included 45 intracranial CSF samples collected daily from 9 adult sTBI patients up to 11 days (d) after injury. The research was conducted in accordance with ethical guidelines, including approval from the ethics committee and informed consent from the patient's family member. CSF samples, as well as SH-SYS5 (neuroblastoma) and U87 (microglia) human cells, were lysed in a protein extraction buffer. Proteins were separated by denaturing electrophoresis, transferred to a nitrocellulose membrane by wet transfer, and analysed by western blot using a pan-cadherin antibody, following Ponceau staining.

Results
Cadherins were detected in SH-SYS5 and U87 cells as multiple bands of varying intensity, ranging in size from 40 kDa to 140 kDa. In CSF samples, cadherins of varying molecular weights and signal intensities were identified in 17 out of 45 CSF samples and these resembled those observed in the cell lines. Most cadherin signals were detected in d1-3 after injury, while two sTBI patients were cadherin-positive at d4 and beyond.

Discussion/Conclusion
This preliminary study highlights the potential of cadherins as biomarkers for brain tissue injury and neurorecovery, as their patterns of expression over time were detected in post-sTBI CSF. Future research should focus on identifying and quantifying specific cadherin types to determine their tissue origin and potential role in TBI pathophysiology.

Keywords:
Biomarkers; Blotting, Western; Brain Injuries, Traumatic; Cadherins; Cerebrospinal Fluid

Neuroprotective protein PARK7 is readily detectable in human cerebrospinal fluid following severe traumatic brain injury

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Introduction
Severe traumatic brain injury (sTBI) results from an external physical force causing immediate brain damage. Further brain damage is triggered by inflammatory mediators, oxidative stress, elevated intracranial pressure, and, ultimately, cell death and generalised brain oedema.

PARK7 is a multifunctional protein that functions as an oxidative stress sensor, redox-sensitive chaperone, and protease. By participating in neuroprotective mechanisms, it plays a key role in shielding cells against free radicals and preventing cell death. To better understand the neuroprotective response following sTBI, we aim to analyse PARK7 levels in cerebrospinal fluid (CSF) from sTBI patients.

Materials and Methods
The study included adult sTBI patients with external ventricular drainage placed by the attending neurosurgeon. Intracranial CSF was collected once daily during external ventricular drainage application. After protein extraction using lysis buffer, CSF samples were analysed by western blot followed by Ponceau staining and immunoblot to detect the presence of total proteins and PARK7, respectively. The study was approved by the ethical committee, and appropriate informed consent was obtained from a family member.

Results
Nine sTBI patients were enrolled, yielding a total of 45 CSF samples collected from day 1 to day 11 post-injury. PARK7 was detected in all CSFs, with higher levels primarily observed within the first six days after injury, coinciding with increased total protein levels, as detected by Ponceau staining.

Discussion/Conclusion
These initial results demonstrate the widespread and dynamic presence of PARK7 in intracranial CSF during the first few days after sTBI. Due to its neuroprotective properties, PARK7 protein in CSF might play a crucial role in the early stages of recovery following sTBI. To further investigate the tissue source of PARK7 in CSF and its role in sTBI pathophysiology, future research should include more patients, neuroprotection-associated proteins, and additional functional and quantitative tests as a bridge to potential applications in patient care.

Keywords:
Blotting, Western; Brain Injuries, Traumatic; Cerebrospinal Fluid; Neuroprotection; PARK7 protein, human

Novel Therapeutic Candidates & Behavioural Insights in a Mouse Model of EEF1A2- Related Neurodevelopmental Disorder

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Introduction
Epilepsy affects 50 million people, yet one-third remain drug-resistant despite over 25 anti- seizure medications available. Commonly used induced mouse models fail to accurately replicate clinical features of human epilepsy, while genetic models lack spontaneous seizures. EEF1A2-Related Neurodevelopmental Disorder is most commonly associated with heterozygous de novo E122K mutation. Eef1a2E122K/+ mouse model shows EEG abnormalities without noticeable behavioural seizures. This study aims to use a novel non-invasive method to detect behavioural phenotype in Eef1a2E122K/+ mice and use translatome and proteome data to identify potential therapeutic candidates.

Materials and Methods
The top 150 upregulated and downregulated genes, based on log2 fold change, were identified from the Eef1a2E122K/+ TRAP-seq and mass spectrometry experiments. This was then analysed using the Connectivity Map to identify drugs that could reverse mutation effects. Proteomic data from Eef1a2E122K/E122K and Eef1a2D252H/D252H mice were also assessed. Behavioural analysis was conducted using DeepLabCut and Keypoint-MoSeq to classify movement patterns.

Results
Keypoint-MoSeq revealed a distinct behavioural phenotype in Eef1a2E122K/+ mice, particularly in females. Connectivity Map identified several drug candidates, and a literature review confirmed their potential as anti-seizure medications.

Discussion/Conclusion
Some of these drugs are currently being tested in our mouse model. The ongoing study involves EEG and EMG implantation surgeries in Eef1a2E122K/+ mice, followed by synchronous EEG- video recordings aiming to assess their effects on EEG abnormalities and determine if they can reverse the behavioural phenotype identified by Keypoint-MoSeq.

Keywords:
Animal Behavior Epilepsy, Drug Resistance, Mice, Inbred C57BL Seizures

Student Session 7

Treatment of Multiple Sclerosis – a case report

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Introduction
This case report describes the disease course of a patient with secondary progressive multiple sclerosis (SPMS). The patient had been on fingolimod therapy for several years, maintaining disease stability. However, after the abrupt discontinuation of treatment, she experienced rapid disease progression with significant neurological deterioration. This case highlights the importance of controlled therapy transitions to prevent the rebound effect.

Case Report
The patient, a pharmacy technician born in 1974, first developed symptoms in 1992, presenting with sensory disturbances. The diagnosis was confirmed in 1996, and in 2006 interferon beta therapy was utilized. Therapy was temporarily discontinued during pregnancy, and in 2016, the patient experiences difficulty walking up to 500 meters without rest and fingolimod was introduced. Despite no new lesions on MRI findings (2018-2020), the Expanded Disability Status Scale progressively worsened.

In April 2021, the patient was planned for siponimod treatment, but she independently discontinued fingolimod, believing it was no longer effective. Within weeks, she developed rebound effect, experiencing severe neurological decline, developing spastic paraparesis and worsening motor deficits. MRI in June 2021 revealed more than 20 new brain lesions, along with progressive cervical spinal cord involvement. Treatment included methylprednisolone, plasmapheresis followed by the initiation of siponimod, leading to significant clinical improvement. By October 2021, the patient regained independent ambulation (400 m). MRI in February 2022 showed absence of active disease and MRI scans in 2022 and 2023 confirmed the absence of new demyelinating lesions. The patient is professionally active in her field.

Discussion/Conclusion
This case underscores the well-documented rebound effect following abrupt fingolimod discontinuation, which may lead to rapid neurological deterioration and new MRI lesions. Prompt therapeutic intervention, including plasmapheresis and timely transition to siponimod, facilitated disease stabilization. Unplanned discontinuation of fingolimod can have severe consequences, whereas a carefully managed therapeutic switch is crucial for maintaining disease control.

Keywords:
Fingolimod; Magnetic Resonance Imaging, Multiple Sclerosis, Secondary Progressive (SPMS); Plasmapheresis; Siponimod

Sequence Variants in HECTD1 and Their Role in Neurodevelopmental Disorders

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Introduction
The ubiquitin-proteasome system (UPS) is crucial for neural development, and mutations in ubiquitin ligases have been associated with neurodevelopmental disorders (NDDs). HECTD1, a member of the HECT E3 ubiquitin ligase family, plays a significant role in brain development. This study investigates the impact of HECTD1 variants in individuals with NDDs, emphasizing their functional consequences and clinical significance.

Materials and Methods
The study analyzed genetic data from 14 unrelated individuals with 15 different HECTD1 variants, using whole-exome sequencing to identify de novo and inherited mutations. Functional assays in Caenorhabditis elegans and conditional knockout mouse models were performed to assess the effects of these variants on neural development. A large-scale enrichment analysis in 53,305 trios was conducted to evaluate the statistical significance of HECTD1 mutations in NDDs.

Literature Review
Previous research has linked HECT domain-containing proteins to neural tube defects and congenital disorders. HECTD1, in particular, has been implicated in Notch and Wnt signaling pathways. Studies in Caenorhabditis elegans and mouse models suggest that HECTD1 is necessary for development of hippocampus and corpus callosum. Variants in HECTD1 have been found (10 missense, 3 frameshift, 1 nonsense and 1 splicing variant) in patients with epilepsy, ADHD, autism spectrum disorder, and intellectual disability, suggesting a broad impact on neurodevelopment. Study found that 10 out of 15 variants occurred de novo, 2 were compound heterozygous while 3 had unknown inheritance.

Discussion/Conclusion
This study establishes HECTD1 as a critical gene in neurodevelopment, with both loss-of-function and change-of-function variants contributing to disease. The findings emphasize the need for further research to clarify genotype-phenotype correlations and potential therapeutic targets. Early genetic screening for HECTD1 variants may aid in diagnosing and managing NDDs more effectively.

Keywords:
Base Sequence; Genetic Association Studies; HECTD1 protein, Human; Neurodevelopmental Disorders; Ubiquitin – Protein Ligases

From Sleep Disorder to Stroke: A Case Report

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Introduction
Ischemic stroke is a main cause of neurological disability, often associated with numerous risk factors such as hypertension, diabetes, and dyslipidemia. However, recent studies show that obstructive sleep apnea (OSA) is an independent risk factor for cerebrovascular events.

Case Report
A 38-year-old man presented with mild clumsiness in his left hand, which he first noticed while typing on his mobile phone. He had no known history of chronic illnesses, including hypertension or diabetes. Neurological examination showed subtle weakness on the left side, with no involvement of facial muscles, sensory loss, or speech difficulties. His vital signs on admission included a BP of 145/91 mmHg, pulse of 88/min, SpO2 of 99%, and BGL of 6.0 mmol/L. A non- contrast CT scan of the brain was normal, but brain MRI revealed a small right centrum semiovale infarct measuring 6 mm, along with punctate hypointensities (2.5 mm) suggestive of microhemorrhages from hemosiderin deposits. MR angiography showed no abnormalities in the intracranial vasculature. A comprehensive cardiac workup, including echocardiography and transesophageal echocardiography, ruled out embolic sources. Routine blood tests and coagulation studies were within normal limits. Additional investigation included overnight polysomnography, which confirmed severe OSA (AHI 85.4/h). CPAP therapy was initiated, significantly reducing the AHI to 3.3/h. Given the findings, the patient was diagnosed with a thrombotic ischemic stroke, OSA related. Further evaluation included thrombophilia screening, thyroid function testing, and Holter ECG monitoring. The patient was prescribed Aspirin 100 mg/day, Clopidogrel 75 mg/day, and Atorvastatin 40 mg/day, with plans for regular lipid profile monitoring and continued use of a personal CPAP device.

Discussion/Conclusion
This case highlights OSA as an independent risk factor for ischemic stroke, particularly in patients without traditional vascular risk factors. The pathophysiological link involves intermittent hypoxia, sympathetic overactivity, systemic inflammation, and endothelial dysfunction, all of which contribute to a prothrombotic state and vascular injury. Nocturnal blood pressure surges and fluctuations in cerebral perfusion further increase stroke risk. Early recognition and treatment with CPAP can improve outcomes and should be considered in all young stroke patients.

Keywords:
CPAP Ventilation, Hypoxia, Ischemic Stroke, Obstructive Sleep Apnea, Polysomnography

A Unique Overlap: Sunflower Syndrome and Drug-Induced DRESS Syndrome

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Introduction

Sunflower syndrome is a rare photosensitive epilepsy characterized by photosensitivity, heliotropism and highly stereotyped seizures, manifested by repetitive hand-waving movements toward light source, often accompanied by absence seizures and myoclonic jerks.

Drug Reaction with Eosinophilia and Systemic Symptoms (DRESS syndrome) is a severe life-threatening idiosyncratic drug reaction that typically presents with fever, facial edema, lymphadenopathy, widespread skin manifestations and multiorgan involvement.

Case Report

An 11-year-old girl, diagnosed with Sunflower syndrome, was admitted to the Department of Pediatrics due to a febrile rash and clinical signs indicative of DRESS syndrome following the initiation of lamotrigine therapy. Ten days after the initiation, the patient developed a fever, followed by a pruritic rash that increasingly spread from the face to the chest and limbs. In the days preceding admission, she experienced intermittent brief absence seizures with eyelid fluttering and eye deviation. Upon admission the patient was afebrile, stable, with a confluent erythematous rash and with no sign of mucosal involvement. In the course of the patient's hospitalization, she developed a generalized epileptic seizure which was effectively resolved with benzodiazepines. Lamotrigine was discontinued and corticosteroids and antihistamines were administered, while antiepileptic treatment was modified.

Discussion/Conclusion

This case report highlights the complexity of treating Sunflower syndrome particularly when compounded by drug-induced DRESS syndrome. It is crucial to compromise between effective seizure control and minimizing the risk of therapy-related side effects, while ensuring prompt recognition and management of severe drug reactions.

Keywords:

Drug Hypersensitivity Syndrome; Epilepsy; Exanthema; Lamotrigine; Photosensitivity Disorders

Plenary lecture 10

Lumbar stabilization techniques in spinal surgery

Albert Haller, MD, neurosurgery resident

Clinical Hospital Center Rijeka

Lumbar stabilization techniques are an essential component in spinal surgery. while managing and treating degenerative spinal disease and trauma. It highlights various methods of vertebrosynthesis such as transpedicular screw fixation, interbody fusion techniques (TLIF. ALIF, etc...). The talk will explore indications, surgical approaches, implant selection, and biomechanical considerations and a glance on MIS (minimally invasive surgery). Case example will highlight the effectiveness of individualized case-based approach that is tailored to patient needs.

Workshop 1

“Stay in your own frame”

- Presentation of Art Psychotherapy in a Group of Post-Adolescents

Student Section for Psychiatry and Psychological Medicine and Paula Jovanović, Prof. of Pedagogy and Group Psychotherapist

The art therapy workshop uses creative techniques such as drawing, painting, and sculpture to help express emotions and inner experiences. Through the artistic process, we develop greater self-awareness, strengthen self-confidence, and improve social skills. Join us for an engaging lecture and workshop where you'll have the opportunity to experience artistic expression firsthand!

Workshop 2

Basic neurological examination

Student Section of Neurology and Mario Hero, MD, neurology resident

In this workshop we will teach you the basics of neurological examination. Through clinical scenarios, you will have the opportunity to test and practice your skills of making a working diagnosis and, based on that, performing a targeted neuro exam.

Workshop 3

Advanced surgical suturing

Student Section for Neurosurgery and Albert Haller, MD, neurosurgery resident

An advanced surgical suturing workshop held by a neurosurgery resident is a great opportunity for students to develop new or sharpen their pre-existing practical skills. Surgical suturing is an essential skill for every young doctor, regardless of specialty. Through this workshop, students will master the skill of using surgical instruments and tying advanced surgical knots on realistic models.

Workshop 4

A Neuroradiologist's View: 45 Minutes Through the Brain

Student Section for Radiology and Asst.Prof. Slavica Kovačić, MD, PhD

What can brain images really tell us?

Join us for a fast-paced neuroradiology workshop where you'll dive into interactive cases and learn how a neuroradiologist thinks, analyzes, and connects clinical findings with imaging. In just 45 minutes, sharpen your diagnostic eye and experience the brain like never before.

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