London College of Animal Osteopathy

Postgraduate Diploma of Equine Osteopathy

Osteopathic manual treatment (OMT) as a complementary treatment in the rehabilitation of a senior hobby horse with suspected chronic sacroiliac joint region injury

Thesis by

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1. Introduction

Injury and subsequent dysfunction and pain of sacroiliac (SI) joint region become an important cause of low-grade lameness and weak performance in school and hobby horses as well as in high-end equine athletes. The diagnosis of this problem is not easy, because the region is covered with large muscles, so the specialists usually must rely on the clinical signs, the visual examination and manual tests to define the origin of discomfort or pain of this area. The gold standard imaging tool for definitive diagnosis of SI injury is nuclear scintigraphy. The cost of this examination is high, so usually owners do not invest such a large amount of money to have the diagnosis.

Nowadays fortunately manual therapy for horses is also available in Hungary, so the combination of medical and non-medical ways of rehabilitation could be applied parallel.

The first part of the thesis is a short review of literature on SI injury and the possible ways of rehabilitation of this disease. The anatomy of the region, the manifestations, the clinical examination and different ways of diagnosis and finally the key points of individualized rehabilitation program is shortly reviewed.

In the second part of the thesis is a case study of a senior hobby horse with chronic, low to medium grade hindlimb lameness is presented. After arthroscopic surgery, the lameness remained on the same level, than osteopathic manual treatment (OMT), massage therapy and therapeutic exercises were applied as a rehabilitation program in hope of improvement of the lameness.

2. Short review of literature

Pain of the sacroiliac (SI) joint region is recognized more and more as a cause for low-grade lameness and lack of performance in horses (1).

Anatomy

The sacroiliac joint is formed by the wings of the sacrum (S) and the ilium (I). The sacrum's dorsolateral and the ilium's ventromedial oriented auricular faces are forming a synovial joint with a "close-fitting" joint capsule, with a primary function of absorbing and transmitting the forces generated by the hindlimb during movement (2). The joint is stabilized by a series of SI ligaments, surrounding the pelvic and sacral area (3). Two sets of dorsal ligaments (*lig. sacroiliacum dorsale breve* and *longum*), a series of ventral and interosseal ligaments (*ligg. sacroiliaca ventralia* and *interossea*) and the board pelvic ligament (*lig. sacrotuberale latum*) which divides into two parts (3) stabilizes the SI joint (Figure 1. and Figure ***2***.)

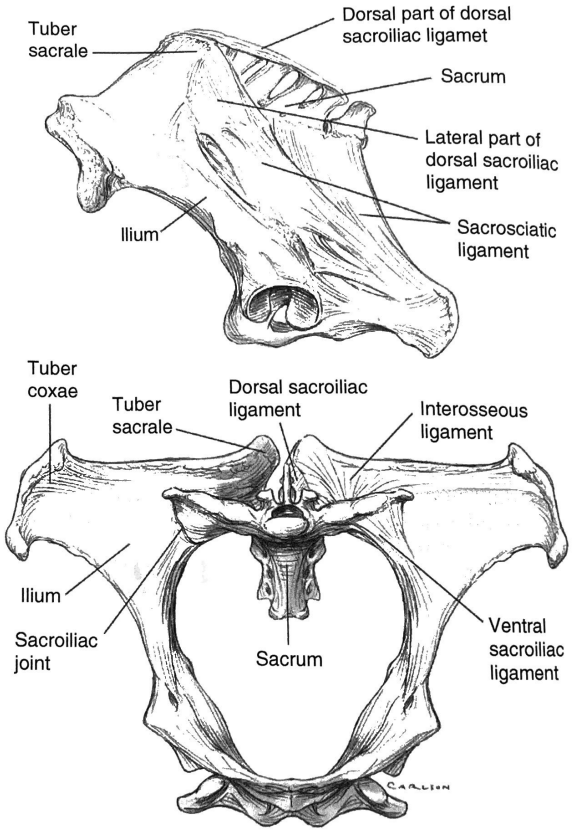

Figure 1. SI joint. Lateral view (top), cranial view (bottom) (2)

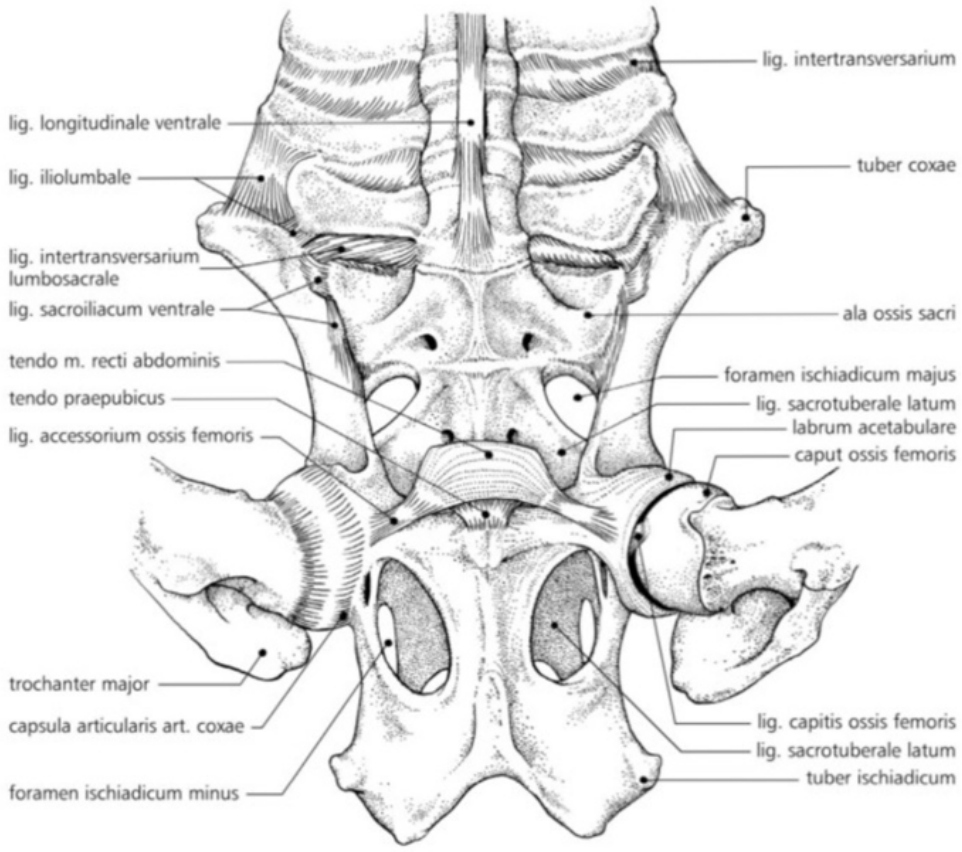

Figure 2. Ventral aspect of the pelvis (3)

Clinical manifestation

There are two major forms of clinical manifestations of sacroiliac pain and dysfunction (1). The first one occurs with poor hindlimb propulsion, stiffness in the thoracolumbar and lumbosacral region and usually above-the-bit tendency during work (4), which can be resolved with local analgesia. These clinical manifestations may represent SI joint ligament or adjacent muscle injury or functional joint instability (5). The second form of SI joint dysfunction is associated with chronic pathology of the region, with marked gait abnormalities and with muscle and bony asymmetry, perhaps gluteal atrophy and shows little improvement to regional analgesia (6).

In general one or both hindlimbs have reduce stride length and asymmetry of the hindquarters can be seen. Under saddle there could be behavioural issues (for example kicking or bucking) when the horse is asked to canter (7).

Clinical examination and diagnosis

During clinical examination of horses with assumed SI disease, emphasis should be placed on observation of the posture of the hindquarters in stance as well as the symmetry of the gait in the walk (7). A delay in the protraction of the hind leg can be seen in the case of sacroiliac pain, so the rear leg impacts with the ground after the paired foreleg rather than just before or almost with it, so it is often described as "stifle lameness" (8). Results of flexion test should be assessed carefully, because usually they are questionable or negative in the case of primary sacroiliac disease, but provocation tests can be useful to determine the origin of the pain in the SI region. Manual provocation of the pelvis through manipulation of the *tuber coxae* and the *tuber ischiadicum* upwards, downwards and in rotation should induce discomfort and pain in the affected area (7).

Van Wessum (9) found that altered sarcoiliac mobility can be associated with several very specific alterations in the normal gait patterns in the horse (Table 1.)

Table 1. Specific alterations of normal gaits associated with altered SI mobility (7)

	Alteration in gait	**Description**
1.	Tracking narrow behind	Looks like the horse is walking or trotting on a cord with the hind legs.
2.	Lateral walk	Performing a serpentine, the walk becomes similar to a pace (specific gait of Icelandic horses).
3.	Haunches in/out	The asymmetry of the pelvic area results in a slight bending to one side.
4.	Asymmetric tail position	When the tail is held and stayed to one side during serpentine.
5.	Bunny hop canter	The clear 3 bit is less obvious or disappear.
6.	Reduced flexibility of the lumbosacral region	Manipulation and provocation tests, lumbar rocking.

Percutaneous ultrasound examination of the sacroiliac region is a useful aid in diagnosing the SI joint diseases, as well as for examining the *m. longissimus dorsi* and the *lig. sacroiliacum dorsale* (10).

Amongst the wide range of diagnostic tools, the detailed and careful clinical examination, followed by nuclear scintigraphic evaluation and local analgesia of the SI region allows precise localization of the pain in this area (11).

Rehabilitation program

In all cases of SI disease an intensive rehabilitation program is the base of the complete recovery. The approach of the rehabilitation program is controversial. Van Wessum (7) stated that complete stall rest with no turnout for the first two months is the only effective way to achieve immobilization and prevent uncontrolled movement of the pelvic region. While Goff (12) stated that stall confinement or forced rest is contraindicated. The rehabilitation program should be individualized on the basis of considering the severity and distribution of the pain as well as the functional instability or the decreased range of motion (ROM) in the SI joint or region (12).

Steps of the individualized rehabilitation program of SI joint instability:

- Pain management is the paramount of the rehabilitation program, 1000mg phenylbutazone q 12 hours/5-600bwkg should be applied (7).
- To restore optimal ROM, passive and active mobilization and manipulation:
    - gentle manual therapy;
    - acupuncture;
    - ciropractic care and low-level laser therapy (13)

  should be carefully performed by a skilled manual therapist (12).
- In order to improve functional deficits, specific exercises should be implemented on an individual base concerning the needs of the horse. Number and timing of exercises should be carefully determined. Emphasis have to be placed on the optimal time for rest during practice (5).

- The following muscles should be targeted for stabilizing the SI and lumbosacral (LS) region (3): *m. sacrocaudalis dorsalis et ventralis medialis et lateralis*, *mm. multifidi., m. psoas minor, m. iliopsoas (m. psoas major, m. iliacus, m. quadratus lumborum), mm. abdominis (obliquus internus et externus, rectus, transversus).* The following exercises should be implemented for stabilizing the muscles listed above:
  - Dynamic mobilization exercises targeting *mm. multifidi* (14).
  - Pelvic flexion exercises targeting *m. psoas minor* and *m. iliopsoas,* such as subtle caudal weight shifting, sternal elevation and flexion reflexes. All should also be carried out rhythmically (12).
  - Increasing the activity of abdominal muscles with ground pole and trotting exercises (15).
- The following muscles should be targeted for enhancing hindlimb propulsion (3): *m. gluteus medialis, m. tensor fasciae latae, m. biceps femoris, m. semitendinosus, m. semimembranosus*. These muscles are activated by induced caudal weight shifting, backing up on horizontal surfaces (15). The vertebral portion of *m. biceps femoris* could be activated by caudal weight shifting with the diagonal forelimb in stance (12).
- Activating functional musculature can be carried out by manually induced sternal and pelvic reflexes and flexions as well as with specific exercises targeting global muscles of the pelvis and the trunk (15). Exercises should be applied for 6 weeks, every second day (16).

During the rehabilitation, the owners and trainers need to be educated on the proper delivery of training exercises as well as the correct way of interpreting the outcomes of the everyday rehabilitation work.

Prognosis

The prognosis should be guarded in the case of SI injury, because of the highly individual interpretation of the rehabilitation program. In 3 months interval of interpreting dynamic mobilisation exercises and gymnastics, the improvement of stride length and tracking distance and the increase in cross-sectional area of *mm. multifidi* proved to be significant (16). In the case of a not individual 6-months long rehabilitation Van Wessum experienced more than 90% recovery rate of SI injured horses in his practice (7).

3. Case study – Rehabilitation of a senior mare with suspected SI ligament injury

Initial data:

Breed: ..... Hungarian halfbred (kisbéri x quarter)

Date of birth: ..... 2008 (assumed)

Sex: ..... mare

Colour: ..... chestnut

Case history

The horse arrived to this stable in 2022, with known low to medium grade left hindlimb lameness. Detailed examination and radiographic imaging of the left hock and left stifle was carried out in October 2022, and showed periarticular osteophyte formation, flattening of the tibial plateau, and narrowing of the joint space in the left medial femorotibial joint.

Arthroscopy of the left medial femorotibial joint was carried out in February 2023. Recovery of the surgical intervention was smooth and no complication occurred.

Low to medium grade lameness continued, with problems in canter on the left hand (behavioural issues – kicking, bucking – occurred when striking in). The horse was not able to perform quartrers-in or out.

In May 2023, a diagnosis of fibrotic myopathy of the hamstrings was made on the basis of detailed clinical examination, carried out by a lameness specialist veterinarian.

Regular whole body massage was carried out by a trained horse masseur.

Osteopathic Manual Treatment (OMT) sessions as a part of the individual rehabilitation program

05-09-2023

Observations: Grade 2 lameness of the left hindlimb was observed. Tail position was fixed on the left in walk and trot. No contraindications of complementary manual therapy were presented.

Findings: ROM and quality of the joint movements of the hindlimbs were symmetrical. Slight left pectoral stiffness, medium stiffness during rib cage technique was found, as well as bilateral gluteal and zygomatic sensitivity (++) occurred (Type II Somatic Dysfunction). Stiffness of the left side of the neck was observed. There was no stiffness in the left hamstrings.

Manual techniques applied:

- whole body osteopathic articular balancing (OAB);
- high velocity low amplitude (HVLA) technique (bilateral: pelvic and hip manipulation, left occiput-atlas and atlantoaxial manipulation), after it sensitivity test points showed little or no reactivity (zyg, glut +/-);
- left forelimb functional release technique.

Advised: 4-5 days walk and trot, and then 10-12 days return to original exercise load. After it, some therapeutic exercises (serpentine riding in a shallow ditch and riding a slope sideways (15) should be implemented.

29-09-2023

On 11-09-2023 after a cross country riding with new exercises (serpentine on uneven surface and climbing shallow slopes) in walk and trot, the lameness worsened. The “feeling” of this lameness during riding was not as bad as it looks like from the ground (according to the trainer). Since then, normal work in the round pen, and normal riding was implemented and the lameness not worsened, the horse has no problem during trimming the hindlegs.

Observation: Grade 3 lameness of the left hindlimb. No contraindications of complementary manual therapy were presented.

Findings: pelvic provocation on the left side resulted in pain avoidance, then she gave the right hind leg with difficulty. Coxofemoral hypermobility of the left hindleg, lumbar stiffness on both sides, and bilateral pectoral stiffness was observed. Slight bilateral gluteal test point sensitivity (+/-). Withers sensitivity radiating downwards at the caudal side of the scapula.

Manual techniques applied:

- whole body OAB with particular attention on the lumbar area;
- strain-counterstrain technique on acupressure points (FL13, GV4, BL48-49, GB30) (17);
- short lever technique (Th8-9);
- fascia release technique in the thoracoabdominal region.

Therapeutic exercises were implemented, specific attention to have enough resting time when performing them. These exercises should be performed before work.

- Dynamic mobilization of the back (14) 5 times for both sides, 5 days a week, for 3 months.
- Sternal elevation and flexion, 3-5 times for both sides, 5 days a week.
- Flexion of the pelvis with manual pressure and rubbing bilateral to the base of the tail, 3-5 times a day, 5 days a week.
- Manual holding of the tail and carry out “haunches-in” during walk for 5 steps and straight again.
- Working on ground poles in straight line (15).

Slight work on straight line with double long lines. Consultation with the treating veterinarian for NSAID application is strongly advised. Daily assessment and record of the lameness should be carried out by the trainer.

06-10-2023

The horse worked on double long lines and therapeutic exercises were carried out in the previously defined amount. Improvement in the left hindlimb lameness was observed by the trainer, no daily record was made on clinical signs.

Observation: Grade 2/3 left hindlimb lameness was observed. No contraindications of complementary manual therapy were presented.

Findings: Improvement in sensitivity and movement of the hindlimbs. Left hip hypermobility and pectoral stiffness was observed. No tender point gluteal and zygomatic test point. Very slight stiffness of the lumbar region, no stiffness in the neck.

Manual techniques applied:

- Whole body OAB;
- Strain-counterstrain technique on acupressure points (FL13, GV4, BL48-49, GB30) (17);

Therapeutic exercises should be continued. Preferably kids (no heavy weighted rider) should work with the horse. Slight riding work on straight lines, in walk and trot. Consultation with the treating veterinarian for NSAID application is strongly advised. Daily assessment and record of the lameness should be carried out by the trainer.

07-11-2023

Phenylbutazone was applied for 7 days, no improvement was observed in the lameness (Grade 2/3). The trainer (adult) started riding on the horse. As a result of phone consultation with another osteopath, high and medium rhythm trot and right lead canter was introduced in the horse’s work.

Observations: Grade 2 left hindlimb lameness, and left gluteal muscle atrophy can be seen. No contraindications of complementary manual therapy were presented.

Findings: medium pectoral and thoracic sling stiffness. Hypermobility of left coxofemoral joint. Bilateral gluteal and zygomatic test point reactivity (++). In the cervical, thoracic and lumbar spine no stiff area was observed. During OAB (tail holding technique) of the left ribcage discomfort was observed.

Manual techniques applied:

- whole body OAB;
- bilateral HLVA manipulation of the pelvis, no pain was observed in the gluteal and zygomatic test points.

The following therapeutic exercises were recommended for the next two months:

- Dynamic mobilization of the back, pelvic flexion and tail holding flexion should be continued.
- Exercises from the ground:
    - Work with dually halter: slight backwards weight shifting, and backing up in straight line on horizontal ground; playing swing with backwards and forwards steps.
    - Working in circle with 6m in diameter in slow walk (3-4 circles both sides), to involve epaxonal back muscles into the movement of the trunk.
    - Lateral movements in circle (14m in diameter) with aids from the ground (tail holding or double long line).
    - Serpentine in walk (150-200m), with 3m loops.
- Ground pole exercises:
    - Serpentine on poles in straight line.
    - Therapeutic poles – for strengthening the SI and LS region as well as for mobilization, and development of balance (Figure 3.)

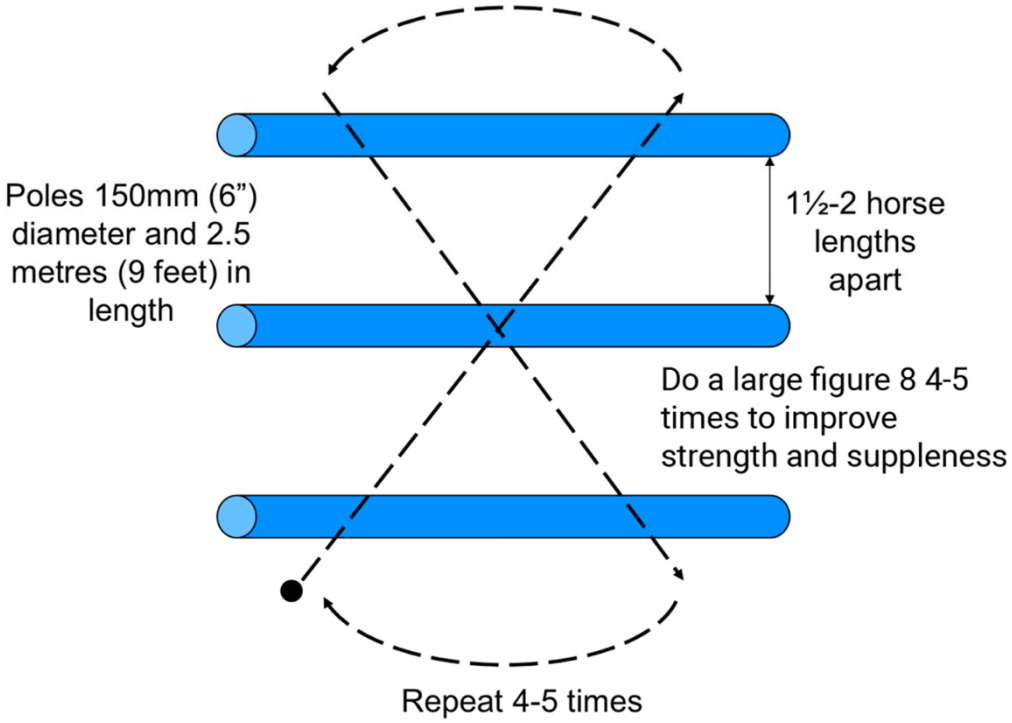

Figure 3. Arrangement of therapeutic poles (18)

- Elevated pole exercises:
    - Slant-raised pole fan.
    - Stretching and shortening of strides with pole series (first in walk than in trot).
    - Figure "eight" with poles (on the ground or elevated).

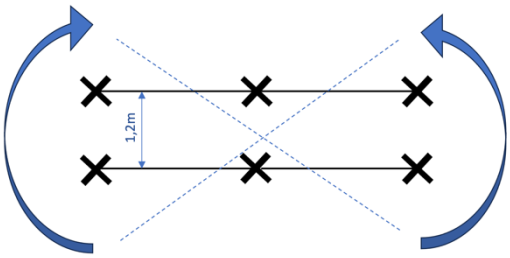

Figure 4. Figure "eight" pole arrangement

    - Shoulder-in, shoulder-out, straight, haunches-in, haunches-out, straight series.
    - Long and low transitions (from trot to walk).
    - 6 to 8 poles series to improve equal stride length, rhythm and focus.
    - 6 poles, alternating end elevated to improve the tone of the trunk.

- Work in canter

  If the horse performs well in the exercises listed above, and stride length and asymmetry also improve, the work in canter should be introduced. Long and low transitions in straight lines as well as bending for both sides should be implemented.

The prognosis of the rehabilitation program of this senior mare with the suspected SI injury should be carried out slowly, carefully and patiently. The outcome of the rehabilitation depends on several factors:

- The paramount of the rehabilitation program in this case to reach the normal range of movement of the left hindlimb, strengthening the deep pelvic muscles as well as the core muscles to decrease hypermobility of the area.
- Since this lameness had been onset for several years the rehabilitation may take a long time, and therapeutic pole and ridden exercises should accompany this horse in her life, of course in a decreased amount.
- The commitment of the owner and the trainer to the welfare of this horse has key importance in the everyday work.

4. Discussion

The short review of literature on SI injury and pain in horses could be a useful aid in the practice of equine osteopath colleagues. In the authors opinion the disease of this region contributes to the development of the Type II Somatic Dysfunction, but further case studies are needed.

In the case of the senior mare, during osteopathic care sessions no severe stiffness was observed, as a result of regularly applied massage therapy, but the pain (with different intensity) of the region of *tuber sacrale* and the sensitivity of gluteal test point proved to be a constant finding. After manipulation of the pelvic area with HLVA, these painful reactions decreased in the area of *tuber sacrale* and the sensitivity of gluteal test point dissolved.

The discomfort during rib cage technique (tail holding technique, carried out from the right side) was most probably related to the lateral movement of the sacrum, not to the stiffness of the rib area. In the case of this senior mare the relief of the body after OAB was observed after all sessions (relaxed head position, patience for up to 40 minutes of manual therapy), especially when acupressure points were pressed. According to this, the complementary value of the OMT is confirmed in this case of SI injury and pain.

It is very important to prepare manual and manipulative techniques of the affected area on purpose and with caution. The individual rehabilitation program, the workload and the stages of the work should be properly defined and trainers should adhere to it.

The deterioration of lameness at the beginning of the rehabilitation program was most probably related to the weakness of pelvic and sacral stabilizing deep muscles. Years of lameness, without conscious strengthening of the core muscles of the pelvic area should lead to hypermobility and instability. Restoring the normal range of movement and strengthening the core muscles of these instable regions are a huge and tiring work, and needs consistency and commitment from all parts of the team: the owner, the trainer, the therapists and the specialists as well.

The rehabilitation program of this senior mare will last at least 6 months with therapeutic exercises, during this period regular osteopathic care and manual massage is recommended. Consultation with the treating veterinarian is also important.

5. Acknowledgement

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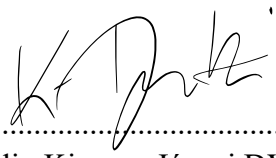
18. Kohnke's Own

Csömör, 2023. November 14.



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