What is Intervertebral Disc disease (IVDD)

And How can osteopathy help recovery

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10/2/25

How osteopaths can help dogs with IVDD Diagnoses

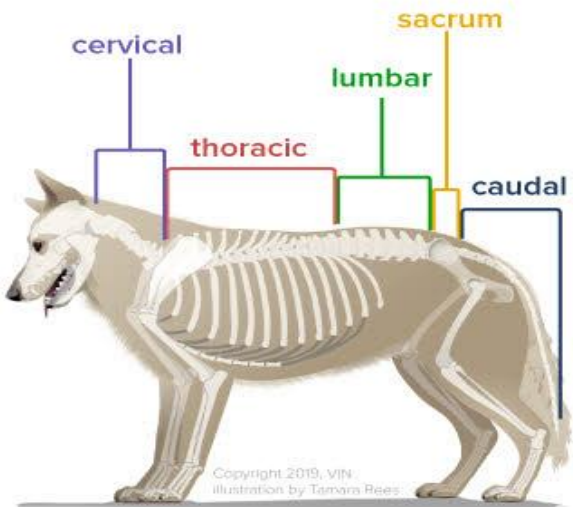
In this thesis I will address how using Osteopathy can help the healing of dogs with Diagnosed Intervertebral disc disease (IVDD). I will explain what Osteopathy and Osteopathic Articulation balancing (OAB) techniques are and how functional techniques can provide relief from Intervertebral Disc disease (IVDD). With a discussion on what is Intervertebral Disc disease (IVDD) and how it affects dogs of specific breeds and ages. The effects and statistics of surgery verses no surgery.

What Is Intervertebral Disc Disease

The spine is made up of numerous smaller bones called Vertebrae that house and protect the spinal cord. The vertebrae make up the spine and allow for flexibility of the back. The vertebrae are connected by joints called intervertebral discs. The disc serves as a cushioning between the vertebral bodies of the vertebrae. It consists of a fibrous outer shell (called the annulus fibrosus), which is a jelly-like interior (called the nucleus pulposus), and cartilage caps on each side connecting it to the vertebral bone. Ligaments run below and above the disc, being particularly rich in sensitive nerves. The ligaments are called Dorsal (above) and ventral (below) longitudinal ligaments, and they run the entire length of the vertebral column.

Spinal system

There are seven cervical (neck) vertebrae
13 thoracic (Chest) vertebrae
Seven lumbar (lower Back) vertebrae
Three sacral vertebrae (which are fused)
A variable number of tail (caudal) vertebrae



The most common areas of the spinal cord that are affected by (IVDD) include the Cervical and thoracolumbar region. Clinical presentations of (IVDD) vary depending on the following factors. Progression is it Acute or Chronic. The dynamic force at which the disc material compresses the spinal cord, the degree of hypoxia presents in the spinal cord tissue, the mechanical displacement of the spinal cord and the duration of the injury.

The Cervical Intervariable disease accounts for 12.9 %-25.5% of overall intervertebral disc herniation cases, whereas thoraco-lumbar intervertebral disc disease (T3-L3) accounts for 66%-87% of overall intervertebral disc herniation cases.

Intervertebral disc disease (IVDD) is an age related, degenerative condition. However certain 'at-risk 'dogs (chondrodystrophic breeds and crosses) can suffer disc problems from when they are young adult dogs. Disc degeneration is thought to occur because of the loss of the disc to "hold water" becoming dehydrated. Chondrodystrophic dogs, which characteristically have disproportionable short and curved limbs, for example, basset hounds, dachshund, Lucas terriers, and shih tzus.

The discs can do 3 things.

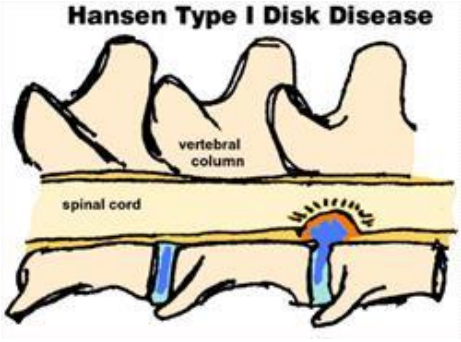
1. Degenerate (Bone breaks down becomes weaker over time)
2. Bulge (The cushioning discs between the bone of the spinal column bulges into space)
3. Rupture (When the disc in the spine breaks and compresses)

Degeneration of the disc results in diminished shock- absorbing capacity and can lead to disc herniation and spinal cord compression. The herniation is often described as:

Hansen Type I: (Nucleus Pulposus degeneration and extrusion)

The soft, jelly-like center of the disc becomes hardened. When the dog does one wrong jump, or has a sudden impact, the rock-hard like disc shoots out of its thick shell and pushes upward into the spinal cord and its surrounding nerves. With this movement of the disc material (called herniation) causes compression and bruising of the spinal cord. This brings sudden, shard pain with varying degrees of reduced nerve function.

Type I: Disc disease is most common in Dachshunds and other similar breeds with the same body structure. Dachshunds Sadly are the most common breed to develop the disease, making up 45 to 70% of cases of IVDD, Dog breeds with long backs, short and bowed legs, have faster disc deterioration than other breeds and occurs most commonly in younger dogs, 5 to 8 years of age.



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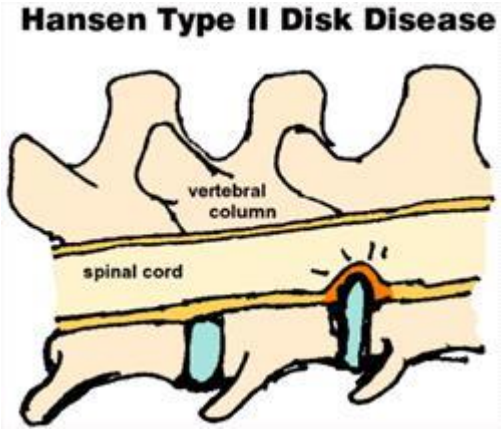
Hansen type II: (Annulus fibrosis degeneration and protrusion)
This is a much slower degenerative process, where the disc material impinges on the spinal cord and spinel nerves over time from a matter of months to years. The thick fibers around the soft disc material will slowly collapse over time and push upward. This causes more long-term pain and spinal cord compression.

Type II: disc disease is more common in German Shepards and other large breeds, and occurs most commonly in older age dogs, 8 to 10 years of age.



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Causes And Symptoms

Causes:

Any dog can develop IVDD, but some breeds may be predisposed to this condition because of their anatomy. Dachshunds, Corgis and basset hounds have short legs and long bodies that is low to the ground, “If these dogs where trucks they would have 18 wheels because they would need them to carry them, but they only have four legs”, Dr, Attas explains, so there’s a long area their body that isn’t getting a lot of support. If dogs with long bodies and short legs are overweight, they may be at elevated risk for developing IVDD in the thoracolumbar area because of the added pressure on the spine. Recent studies suggest that body shape alone doesn’t necessarily make dogs prone to IVDD. There may be a genetic component to IVDD predisposition, even among dogs of the same breed. Research shows that there seems to be less risk of IVDD in standard wirehaired dachshunds, as opposed to standard and miniature longhaired and smooth coated dachshunds.

Large dog breeds like: Labradors, Retrievers, Doberman, German shepherds, are also prone to a Degenerative form of disk disease. Dr Attas explains, the disc that is meant to cushion the spine can become brittle with age. Little pieces of the disk can dry out and break off, which can cause damage to the spinal cord.

The other cause of IVDD is an injury that results from jumping or experiencing a hard landing. One moment, the dog can be playing and jumping, and then they may suddenly cry out in pain. The force of the movement can damage a disk, resulting in acute pain and pressure on the

spinal cord. In some cases, the dog's personality changes because they can no longer participate in activities they once enjoyed. In other cases, sometimes your dog is fine one day and the next day they wake up in pain without any obvious signs of injury.

Symptoms:

The symptoms of IVDD depend on the type of disc herniation and the location in the spinal column. The most common sites of disc herniation in dogs are at the end of the thoracic vertebrae (T11-T12) the beginning of the lumbar vertebrae (L2-L3). These type of herniations are painful impact a dogs ability to move. If it's cervical (neck) herniations they tend to create more pain but less loss of function.

Symptoms of neck Intervertebral disc Disease (Cervical IVDD)

1. Head held low
2. Arching back
3. Shivering or crying
4. Reluctance to move
5. Unsteadiness in all 4 feet
6. Inability to walk normally
7. Knuckling of all 4 paws
8. Inability to support their own weight
9. Inability to stand
10. Inability to feel all 4 feet and legs

Symptoms of Back intervertebral disc disease (thoracolumbar IVDD)

1. Muscle Spasms
2. Tense belly
3. Weakness in hind legs
4. Crossing back legs when walking
5. Inability to walk normally
6. Knuckling of the back paws, or dragging rear legs
7. Inability to support their own weight
8. Unable to move or feel back legs

Symptoms of lower-Back intervertebral disc disease (Lumbosacral IVDD)

1. Pain and/ or difficulty jumping
2. Limp tail
3. Urinary or Fecal incontinence
4. Dilated Anus

Nandini Maharaj
Published: October 24, 2023
www.akc.org

Reference: Dr Barri.J Morrison, DVM
Published December 6th, 2022
www.petmd.com

Dr Wendy Brooks, DVM,DABVP Published March 17, 2011
www.veterinarypartner.vin.com

Diagnostics:

The veterinarian will have to determine whether the problem involves actual compression of the spinal cord. This determination is important because compression can benefit from surgery/anti-inflammatories, while other diseases cannot. Compression in the spinal cord doesn't always come from a disc herniation: it can also be from vertebral fracture or dislocation, a tumor, or a disc infection. Any of these can put pressure on the spinal cord so the veterinarian needs to also take this into consideration when they are doing an examination. The veterinarian may have a strong suspicion based on clinical signs especially in predisposed breeds.

Step one: Neurologic Examination:
Testing different reflexes, the veterinarian can localize the area of the spinal cord that is affected. This may be the cervical area (Neck), the thoracolumbar area (where the chest and abdomen come together), the lumbar (Lower back), or the sacral area (where the tail starts) The thoracic area of the spinal cord is usually spared in disc disease because of the ligaments connecting the ribs to the back provide extra protection for the spinal cord.

Step Two: Radiographs:

In most veterinary practices advanced modes of imaging such as magnetic imaging (MRI) and computed tomography (CT) scanning are not available, so plain radiography is usually what is taken first. Radiograph is also relatively inexpensive compared to other forms of imaging. Plain radiography is used to rule out obvious broken bones or dislocations, calcified discs and disc space collapse can often be seen. When doing radiographs of the neck a general anesthesia or sedation is required to get proper relaxation of the muscle.

Step Three: Advanced Imaging:

If surgery is being considered, then it becomes necessary to identify the exact disc space involved so that the surgeon knows where to cut. Most veterinary surgeons that are equipped to do the surgery will have advanced imaging like CT, MRI or myelography.

Myelography requires a general anesthetic and the injection of iodine-based dye around the spinal cord. The image of the dye can be seen to narrow at the area of spinal cord compression, identifying the area of compression in 85-95% of cases. The patient then goes straight to surgery without waking up from the anesthetic.

If CT is available, a more accurate picture can be obtained as CT shows cross-sectional images of the area of interest. The calcified disc material can easily be seen smashing into the spinal cord.

MRI provides an even better image as the nuances of different tissue types can be seen. Different classifications of the disc disease can be determined.

Step Four: Treatment

Once it is clear from the plain radiographs and neurologic examinations that the patient has a disc disease, the decision must be made as to whether surgery should be pursued. Spinal surgery is very expensive and requires a long recovery period, but maybe the best choice for the

dog to regain normal function. There are some general rules that are typically applied in making the decision, and they are based on pain and function.

1. If the dog can walk, medical treatment is a reasonable choice, but this depends on how much pain the patient is in, and how long the patient has had the signs for and what treatments have been unsuccessful in the past
2. The longer neurologic deficits have been going on, the poorer the results of treatment
3. If the dog cannot walk but has deep pain in one limb, there is a 83-93% success rate recovery with surgery
4. If a dog is unable to walk has no deep pain perception in the limbs but has only been down less than 48 hours, success with the surgery drops to 50-60%. After 48 hours in this situation, the prognosis is much worse, and it may be worth considering.
5. If dogs cannot walk, medical management may still have success although surgery is definitely more likely to yield success.

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Published: March 17, 2011 Revised January 03, 2024

Surgery

Spinal surgery is highly invasive, very expensive, and has the potential for great outcomes as well as poor outcomes depending on the damage already sustained by the spinal cord. Patients that have only been paralyzed for a few days, cannot walk or have pressure on the spinal cord are candidates for surgery. There are several procedures that can be used to decompress the spinal cord and remove the disc material. Spinal surgery can take between one to three hours, depending on the complexity of the procedure, and the recovery can occur over a period of several weeks. Some cases improve more quickly and, sadly, in some cases there is no improvement. If the Spinal surgery is successful then it is unusual for there to be a problem with the same disc. However, there may be a problem with other remaining degenerated discs.

There are several different types of surgery for dogs with Intervertebral Disc Disease (IVDD)

1. **Hemilaminectomy:**
   This is most, commonly performed on disc herniation in the thoracolumbar area. This surgery, the articular facets (where the two vertebral connect) are removed, as is the vertebral bone adjacent to the spinal cord, this procedure can safely be performed over up to five adjacent disc spaces.
2. **Dorsal Laminectomy:**
   This is the most invasive of all the procedures and involves decompressing the spinal cord from the top rather than from the bottom. It can only be done over one disc space and involves removing the dorsal spinous process and lamina.
3. **Ventral Slot:**
   This procedure is reserved for neck discs. Here a slot is drilled in the vertebral bodies of the bones on either side of the disc creating a small window over the disc space. Mineralized disc material can be removed and, since the window includes adjacent bone, there is room for the swollen spinal cord to decompress.
4. **Fenestration:** This is preventive procedure often performed on the disc spaces near the herniated space. It involves making a slit over the annulus fibrosus and removing any mineralized nucleus pulposus. In other words, a slit is made in the soft area between

vertebrae so that any disc material will herniate away from the spinal cord as it follows the path of least resistance. For some patients this is the only surgery needed but it isn't a fully decompressive surgery.

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Published: March 17, 2011 Revised January 03, 2024

What is Animal Osteopathy

Animal Osteopathy is a drug free, non-invasive manual therapy that aims to help improve health and wellbeing across all the body systems by strengthening the musculoskeletal framework. Osteopaths will focus on the joints, muscles and spine with the treatments positively affecting the body's nervous, circulatory and lymphatic systems. The successful treatment of osteopaths in humans became clear that the treatment can be applied with even equal success to animals. Unlike humans, animals cannot tell us that they are in pain or struggling to move in certain areas of their body. Animal osteopaths are largely based on careful observation and manual examinations. Animals will show us signs when they are in discomfort or pain by displaying the following:

1. Increase anxiety
2. Weight shifting off limbs, non-weight bearing
3. Reluctance in jumping in and out of car
4. Reluctance to get up and down from laying position.
5. Unprovoked aggression
6. Ignoring commands
7. Inability to coordinate Obstacle
8. Avoiding Obstacles

According to osteopathic philosophy, when the body's musculoskeletal system is not properly aligned, it inhibits circulatory, lymphatic, or nervous system function and therefore reduces the body's ability to heal itself.

The aim of osteopathic treatment is to help achieve

1. Improved structure and function
2. Pain relief
3. Improves arterial blood supply and nutrients to the affected area
4. Sufficient venous and lymphatic flow
5. Normal nerve transmission

Benefits of Osteopathic treatment:

1. Removes the underlying cause of the pain
2. Relieves chronic pain
3. Helps hormonal changes
4. Reduces scar tissue and adhesions after injury

5. Encourages the body to heal itself
6. Aims to treat the whole body, which promotes self-healing

How Osteopath can help Canine patients with Intervertebral Disc Disease (IVDD)

There are two models to treat osteopathic IVDD

Neurologic model:

The neurological model deals with the effects of facilitated spinal cord segments and sustained symphaticotonia, resulting in viscerosomatic and somatovisceral reflex phenomena. Goals of treatment within this model including Restoring autonomic balance, alleviation of segmental facilitation, decreasing or eliminating abnormal afferent signaling, and relief of pain.

Mechanical model: This model deals with factors that alter posture, motion and gait. These factors include altered joint relationships, muscle imbalances (hyper-and hypotonicity), and abnormal fascial tensions. The somatic dysfunctions can cause or contribute to adverse neurologic and circulatory functions. The goal of treatment with this model is to restore free motion within the body's musculoskeletal system elements.

Treatment recommendation using London college of Animal Osteopathy:

Using AOB for dogs with IVDD can assess all the joints in the dog's body, it can contact every muscle and every major muscle group, The tendons which attach those muscles to those bones. It helps to assess the quality of the ligaments which support the bones and hold the joints together. When moving all the structures we are helping the whole dog and not allowing us to just focus on the underlying issues at that time, as we can miss crucial symptoms in other parts of the animal's body.

Articulation of the spine technique:

Supporting the dog under the abdomen. (stops them from moving around) with a gentle contact with the whole of my thumb against the vertebral column, just start to create a little bit of side bending movement. The left hand will create a fulcrum against the vertebral column and right hand is creating a rocking movement, using the pelvis as a contact point to make the vertebral column move up to the point of contact with the thumb. Moving the vertebral column in a rhythmical, oscillating movement from side to side using contact with the vertebral column with your thumb to help side bending movement both left and right through the thoracic spine and lumbar. Also creating circumduction with hand on sternum, this position allows flexion and extension through the vertebral column and, using side bending, creating circumduction or taking the joint in a circular movement, helping to assure flexibility and movement through the vertebral column and through the ribs,

Neck technique:

Supporting the dog's head using the jaw in front of the ears, using the finger and thumb just behind the head makes gentle contact. Create a little movement in extension (or back Bending) through the head and neck, working all the way down the neck addressing the nuchal ligament,

which supports the back of all the vertebrae. Dogs are reassured by the oscillating movement. We can gently add in flexion and small side bending all the way to the shoulder.

Reference: Osteopathic Philosophy Andrew Taylor Still. M,D
www.westernu.edu/osteopathic/about/osteopathic

London College of Animal Osteopathy:
www.animalosteopathycollege.com

Can we Provent Intervertebral Disc Disease (IVDD) in Dogs:

Yes and No, Intervertebral Disc Disease in dogs can be a predisposed continue manly in certain breeds, but can also happen with many breeds, due to injury and as much as we would love to try wrap them into a bubble and not let them do all the things dogs love to do, we can never prevent it 100%.

When we see patients with this disease already, we are too late to prevent onset. There is a very high reoccurrence rates, and we still want a dog to be a dog and live their best life, so there is a few steps we can take to help reduce the chances of reoccurrence.

1. **Maintain a healthy weight:**
   Overweight dogs are a major risk factor for dogs with Intervertebral Disc Disease (IVDD). This can put pressure on the spine and the discs.
   So, a maintain weight plan with dogs with (IVDD) will help take pressure off the spine.

2. **Exercises:**
   Regular exercise helps to keep your dog's muscles strong and helps to support their spine. Increases their core strength which helps support the spine and keeps it strong.

3. **Restrict Jumping:**
   Prevent pets from jumping onto or off furniture
   1. When a dog is jumping off an object it can be very jarring when landing on a solid surface. Jumping Onto a surface is less jarring for the limbs and spine.
   2. Dog's steps or a dog ramp that the dog can use to go on and off furniture if you still intend to have them on furniture.
   3. Floor rugs/Yoga Matting can be used if your house floor surface is slippery. This will allow your dog to not slip when walking inside and reduces the risk of spinal damage when they slip.
   4. Soft beds aren't ideal for a dog with IVDD, a good orthopedic bed will be a better option for them, as soft bedding is very hard for especially older dogs and IVDD cases to get up and out of a soft bed. This can cause more pain, or they will get stuck.

5. Restricting going up and down stairs, including them running up them. Ideal controlled walking up and down the stairs is key. Leash walking may be needed to help keep your pet controlled so they aren't running up and down the stairs uncontrolled, which has a high risk of injury or re- injury.

4. **Restrict certain games:**
    1. Tug of war/ this game creates the dogs to play very rough and thrash themselves around, using their neck and a lot of spinal pulling.
    2. Ball throwing. When the ball is thrown it needs to be done under the arm and not over arm, so it doesn't bounce in the air and then the dog is made to then leap in the air and land with force on its limps.
    3. Playing/running in deep sand at the beach. Firm sand is fine but the soft and deep sand can course issues with limps, spine, muscle tears and tendon/ligament damage.
    4. Discourage begging position with dog sitting on rump/ coursing restriction through lumbar and thoracic.
5. **Supportive leash Walking:**
    A) Avoid any neck leashes, choke collars, choke chains, halite that controls the dog by their nose.
    B) Using supportive harness that stops any pulling along the spine, Harness that attach at the front of the chest will help reduce any pulling along the spine. Any pulling along the spine can cause trauma in any part of the spine.
6. **Posture Awareness:**
    1. Correcting your dogs posture making sure they are sitting straight, and not slumped over, or legs flopping outwards. We want to encourage body strengthening and control so sitting correctly and laying in a comfortable position is important.
7. **Joint supplements:**
    1. Putting your dog on a good joint supplement that has glucosamine, chondroitin, MSM, which help support cartilage health and can help with wear and tear on the discs.

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www.animalosteopathycollege.com

The principles of Osteopathic

The unity of the body.

The first major principle of osteopathic medicine is the body is a unit; no part functions independently. Any abnormalities in the structure or function of one part of the body may unfavorably influence other parts, and it will impact the rest of the body. There is still a tendency among physicians to isolate illness within a certain organ or system in the body. Osteopathic are trained to recognize that when the body is sick, its all over the body that is unwell. A specific organ or system may become the prime focus of the illness, can be felt to some degree throughout the entire body. When the body has an illness the specific organ system never operates alone, the circulatory, nerves, endocrine and immune system are all brought into

action in a concerted effort to help the body's- wide effects of illness. When the whole body has returned to its normal balance the alleviation of illness has truly been achieved. Animal Osteopathy in summery principle

1. **Holistic approach:**
   Treats the animal's body, as a whole. Osteopaths look at how the body is connected and how dysfunction in one area can impact the rest of the body
2. **Improves function:**
   Restoring the animal's body to normal musculoskeletal function by addressing structural imbalances or restrictions, helping the animal's body to function more efficiently.
3. **Enhanced healing:**
   Animals osteopath helps to support the body's natural healing mechanisms by improving blood flow, reducing inflammation and promoting better movement.
4. **Non- Invasive techniques:**
   Animal Osteopath is a gentle and non- invasive treatment, often involving soft tissue manipulation, joint mobilizations and stretching techniques
5. **Tailored treatment:**
   Just like humans no two humans are alike, which is the same for animals. Osteopathy takes into account, Breeding, age, size, health concerns. Treatments need to be customized to meet the needs of each individual animal.
6. **Preventative care:**
   Animal osteopath can be used as a preventative, and in conjunction with other therapy and modalities. It is used to help prevent injury and those with musculoskeletal issues.

Reference: Osteopathic Philosophy Andrew Taylor Still. M,D
www.westernu.edu/osteopathic/about/osteopathic

Conclusion:

Intervertebral Disc Disease (IVDD) can affect a lot of different breeds with some being a lot more commonly affected. The dachshund is very susceptible to getting (IVDD) because of their long backs and short legs. This doesn't mean they are the only dogs that will get it. Many different breeds can get Disc issues and not just in the lumbar spine, it can happen in thoracic and cervical spine also. Veterinarians will recommend surgery straight away as the surgery results can differ pending on the grade of the Disease, and time is at the Essent's to have a more successful outcome. This also doesn't mean a holistic approach isn't recommended and should always be recommended if the client isn't willing/ or cannot afford to go to surgery. There is plenty of options without surgery, Wheel chairs for support, harness and other therapy modalities like Acupuncture, soft tissue, Osteopath, PEMF. that will also help with the support of a dog with Intervertebral Disc disease.

Animal Osteopathy can be a valuable complementary treatment for dogs suffering from Intervertebral Disc Disease (IVDD).

By focusing on improving musculoskeletal functions, osteopathy aims to alleviate pain, enhance mobility, and support the body's natural healing processes. Through gentle techniques such as joint mobilization, soft tissue manipulation, and spinal alignment. Wither the dog has surgery or doesn't have surgery, animal Osteopaths can help reduce

the tension around the spine and improve circulation, which helps to assist in reducing inflammation and promoting recovery. Allowing time for the Animals body to heal, in its natural course, will be a very effective part of a holistic treatment plan that improves the quality of the life for dogs, by helping to manage symptoms and allowing the dogs with intervertebral disc disease (IVDD) recover more comfortably.

From Naomi Harmer