

## The conservative treatment of cervical hernia in dogs: the importance of respecting procedures – A case study

### Tratamentul conservator al herniei cervicale la câini: importanța respectării procedurilor – Un studiu de caz

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#### Abstract

The intervertebral disk herniation is an abnormal disposal of the nucleus pulposus and/or annulus fibrosus. The displacement can be found in the vertebral canal and/or intervertebral foramen. The affection's therapy can be conservative and/or surgical. The conservative management (non-surgical) of disc hernia is a frequent necessary approach in circumstances in which surgery is not an option for financial, medical or other reasons. This case follows the evolution of a Beagle patient with cervical disk hernia whose therapeutic conservative protocol was modified and prolonged due to its non-compliance which contributed to pain outbreaks.

#### Rezumat

Hernia de disc reprezintă o dispunere anormală a nucleului pulpos și/sau a inelului fibros. Dispunerea poate avea loc în canalul vertebral și/sau în foramenul intervertebral. Terapia afecțiunii poate fi de tip conservator și/sau chirurgicală. Managementul conservator (nechirurgical) al herniei discale reprezintă o abordare de multe ori necesară în circumstanțe în care chirurgia nu este o opțiune din motive financiare, medicale sau altele. Acest caz urmărește evoluția unui pacient din rasa Beagle cu hernie de disc cervicală a cărui protocol terapeutic de tip conservator a fost modificat și prelungit pe parcursul tratamentului din motive de nerespectare a acestuia, fapt ce a contribuit la pusee de durere.

#### Introduction

The process of degeneration of the intervertebral disc is common in the canine species, but most of the affected dogs show no clinical sign of this process.

The clinical symptoms that appear in these cases are caused by the compressive action of the intervertebral discs exerted on the neural structures, thus producing pain and different degrees of neurological dysfunction (2, 9).

Consequently, the clinical signs that appear may result from either the dorsal elongation of the fibers of the fibrous ring

(annulus) or the longitudinal dorsal ligament, which can generate pain by stimulating their nociceptors (21) or by the mechanical shock exerted by the intervertebral disc in degeneration on neural structures, which can lead to both pain and different neurological dysfunctions (16).

According to the specialized literature, disc herniation is classified in: extrusion of the degenerate nucleus and in protrusion of the degenerate fibrous ring in the vertebral canal.

Extrusion produces a compressive and contusive action on the spinal cord, the proportion of which is variable depending on

the volume and rate at which the extrusion takes place.

The protrusion occurs over a long period of time (months-years) thus causing a progressive compression on the spinal cord or dynamic, in the second case the compression being variable depending on the position of the vertebrae (16).

Disc herniation therapy is a topic that has raised many controversial opinions, but over the course of medicine evolution has reached a consensus on the primary therapy of this condition.

This controversy has arisen since the therapeutic tendency is for immediate recovery of the functions, which led to the premise that the surgical intervention is of first intention.

However, in the veterinary sector, disc herniation is often treated with conservative treatment, which involves pain management and restoring the position of intervertebral disc structures by limiting movement, which is supported by numerous studies (2, 6, 7, 10, 11, 12, 13).

Most neurologists agree that an initial period of conservative management is appropriate for patients with cervical hyperpathia (3, 15).

Another disputed topic in the therapeutic management of disc herniation is the importance of the anti-inflammatory class used to relieve pain, and there is evidence that using steroidal anti-inflammatory drugs could lead to irreversible spinal cord injury (19).

Although it is known that only a certain percentage of patients with profound sensitivity will recover post-surgically, this type of sensitivity has remained the current prognostic factor for the evolution of patients with disc herniation, making it difficult to decide on surgery or conservative treatment (21).

## 1. Case presentation

A 7-year-old, female, Beagle dog was brought to the consultation because the owner

noticed limiting certain movements such as: jumping on the bed, getting off the bed, climbing the stairs; the patient preferring not to perform these actions.

According to the anamnesis, the patient expressed sensitivity especially to the palpation of the cervical area, maintained his appetite but changed his general status becoming more sedentary.

Following the clinical inspection, it was observed a general instability when the dog was at rest and instability of the forelegs when the dog is walking.

Also, a generalized tremor was detected.

At the palpation of all segments of the spine, no signs of sensitivity were detected.

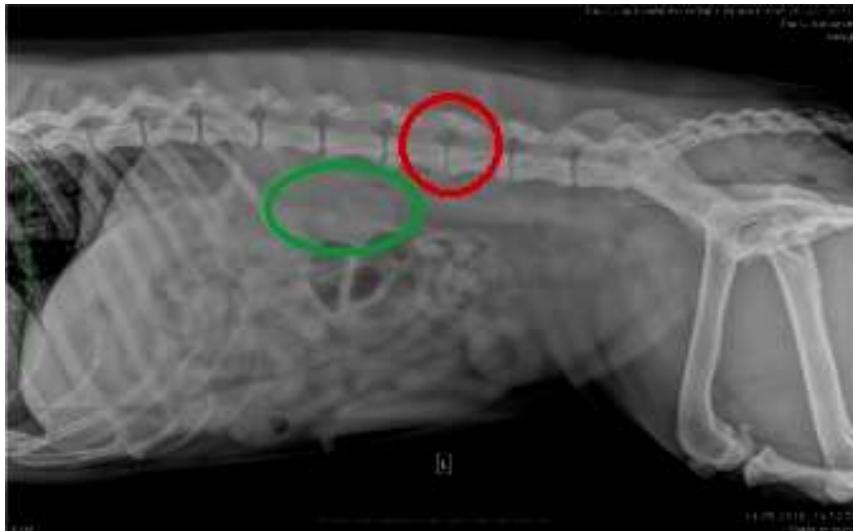
The palpation of the right anterior limb triggered signs of sensitivity manifested by vocalizations and palpation of the abdomen concluded the presence of the abdominal shield.

The neurological examination did not reveal significant changes such as: delay or exacerbation of reflexes, modification of proprioception, delay of pupillary reflex and changes of limb position during walking.

## 1. Materials and methods

In order to establish a diagnosis, a CT scan examination at the spine level was performed. 7 months before, the patient presented a similar episode that began with vocalizations when reaching the left posterior limb, the radiographic examination performed revealing the presence of a narrowing of the L4-L5 intervertebral space, a possible discal pathology at this level and a radiopacity similar to the mineral in the area of the left kidney, suspected to be lithiasis (fig. 1).

The patient received anti-inflammatory drugs for a period of 7 days and since then no clinical signs of locomotor sensitivity have been seen until the current episode.



**Figure 1.** Abdominal and thoracolumbar sacral spine x-ray.

Red circle: narrowing of the L4-L5 intervertebral space with possible disc pathology.

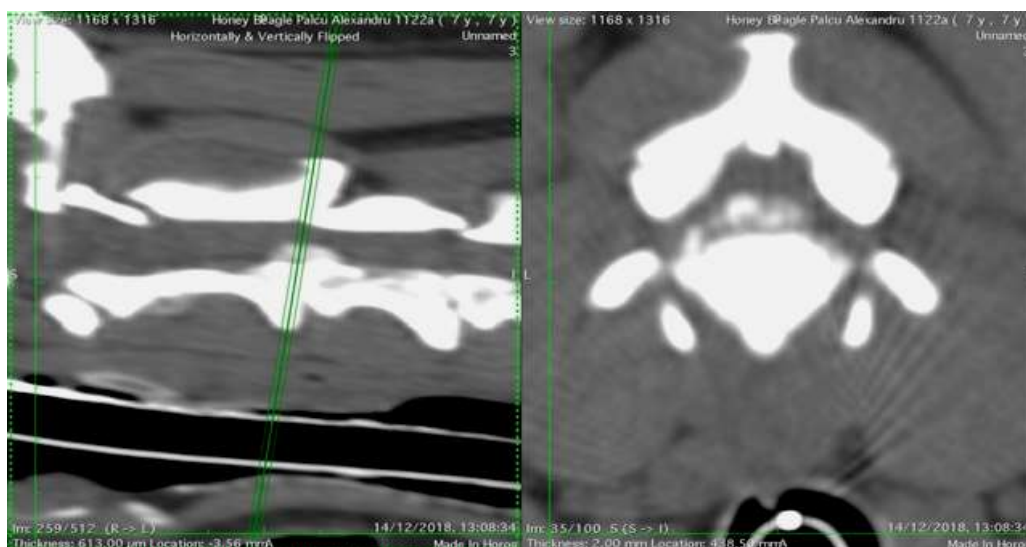
Green circle: radiopacity similar to the mineral projected on the left kidney area - possible lithiasis

In order to perform the CT examination, the aim was to relief the pain for a period of 4 days, the therapeutic protocol consisting of the injection of:

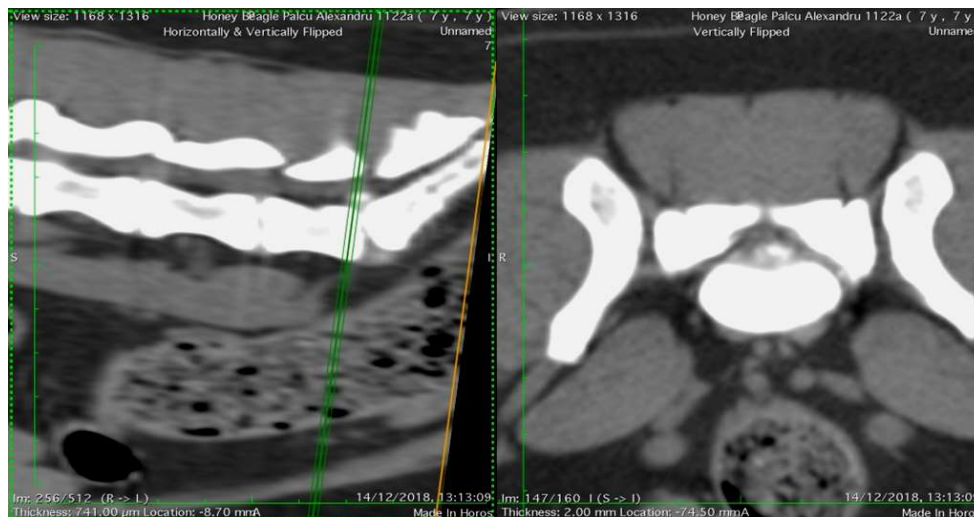
- (1) non-steroidal anti-inflammatory agents: meloxicam 0.2 mg/kg, algocalmin 500 mg,
- (2) vitamin B1 (400 mg / 48 h),
- (3) gastric bandages: ranitidine 2 mg/kg/ 24 h, and
- (4) tolperison administration at a dose of 50 mg/12 h, which was discontinued the day after the patient started vomiting and was apathetic shortly after ingestion.

After the CT scan, the presence of a disc extrusion was observed in the C2 - C3 vertebrae with expulsion of disc material in the medullary and left paramedian medullary canal, in the foramen, the medullar compression being 50 - 60% (fig. 2).

Lumbosacral, at L4-L5 level, was observed the degenerative discal change, with hypertrophy of the left medial and paramedian fibrous ring stenosing to a small degree the left foramen (Fig. 3).



**Figure 2.** Disc extrusion in the C2-C3 vertebrae with expulsion of disc material in the median and left paramedian medullary canal, in the foramen. Bone marrow compression of 50-60%



**Figure 3.** Discal degenerative change with hypertrophy of the medial and left paramedian fibrous ring - small stenosis of the left foramen - lumbar area, level L4-L5

By corroborating the anamnesis, the clinical examination and the imaging examination, we established the diagnoses of cervical extrusion and lumbar protrusion, the clinical signs being caused by the cervical discopathy.

For the establishment of a therapeutic protocol, a blood sample was collected for the evaluation of the renal and hepatic markers.

We evaluated: urea, creatinine, albumin, GPT, GGT, GOT, bilirubin, cholesterol and alkaline phosphatase and all of them were within physiological limits.

The therapeutic management recommended accordingly was:

**A.** Orally administration of the following:

- steroidal anti-inflammatory drugs - cimicoxib 2 mg/kg/24 h for one month,
- opioids - tramadol 2.5 mg/kg/12 h for 7 days, 1.25 mg/kg/12 h for 7 days and then 1.25 mg/kg/24 h for 7 days;
- gastric bandages - esomeprazole 1 mg /kg/24 h in the morning 30 minutes before meal for one month;
- vitamin B1 - 2 mg/kg/24 h;
- permanent administration of a supplement containing chondroprotective substances (glucosamine, chondroitin, MSM, hyaluronic acid), anti-inflammatory substances (curcumin, shellfish extract with green lips)

and antioxidants (vitamin C, vitamin E, selenium);

- hepatoprotective: phospholipids.
- B.** Resting in a cage, on a mat for a period of 14 days;
- C.** Avoiding or limiting walks for a period of at least 14 days;
- D.** Slow walks and on a leash for a period of 3 months;
- E.** Wearing a cervical collar for children for 3 months;
- F.** Permanently positioning of the food bowl at the level of the chin area;
- G.** Permanently use of the harness instead of a leash.

The encountered obstacles in the management of this case were caused by not respecting the points B, C, D and E, by the owner because the he interpreted the improvement of the patient's condition as the result of a complete recovery.

As a result, twice during the patient's therapy, injection of anti-inflammatories and opioids was required as orally administration was impossible; this was due to the patient's

intense vocalization upon reaching the oral cavity.

Thus, following these incidents, the therapy with steroidal anti-inflammatory drugs was prolonged up to 45 days.

After 3 months from the onset of clinical signs, the patient was brought to the clinic for the evaluation of the biochemical parameters after administration of anti-inflammatories and clinical re-evaluation.

At the inspection, no changes were detected, the first visit to the doctor having as a clinical sign the generalized tremor.

At the palpation of the spine and limbs no signs of sensitivity were detected and at the abdominal palpation the presence of the abdominal shield was not detected.

Also, the neurological examination showed no changes and the renal and hepatic biochemical markers were within physiological limits.

## 2. Results and discussions

Surgery can be used as the last method of therapy in cervical hernias.

The ideal candidate for conservative therapy must be stable or chronic and moderately affected: with locomotion present, with moderate or absent neurological deficits and pain that can be controlled.

A general opinion is that the conservative treatment is of first intention, this being represented by: resting in the cage, limiting the movements, walking in the leash, wearing the cervical collar, lifting the food bowl at the level of the chin region, using the harness for walking and not a leash and the administration of anti-inflammatory drugs along with the medication intended to counteract some of its adverse effects: hepatoprotective, gastric bandages.

Another reason why conservative treatment is preferred is that any surgery presents risks and associated complications, in which case they are represented by:

- urinary tract infections (17),
- infections at the surgical site (8),
- myelomalacia (4),

- deterioration of the neurological status (20),
- degenerative changes of the already affected intervertebral disc (18),
- epileptiform seizures due to myelography and/or anesthesia (1), with increased frequency when myelography is performed in the cranial portion of the spine (14),
- cardiac dysfunction (arrhythmia, bradycardia) (5).

Because regardless of the method of therapy chosen (conservative or surgical) the administration of anti-inflammatories is necessary, it is important to evaluate the patient's renal, hepatic and digestive status through biochemical blood tests and/or urinary summary evaluation and abdominal ultrasound; anti-inflammatory drugs being able to have significant effects on these organs.

The side effects of non-steroidal anti-inflammatory drugs are: kidney injury, liver injury, gastrointestinal discomfort, melena, vomiting, coagulopathy, undermining bone healing.

In the management of these cases, there are two compulsory synergistic therapeutic branches:

- 1) The first branch aims to stop pain using anti-inflammatory and/or analgesics. In this case, the therapeutic compliance of the owners plays an important role in the management of the disease since the administration of anti-inflammatories requires the strict observance of the adjacent medical indications: the administration of hepatoprotectors, the proper administration of the gastric bandages and the administration of the anti-inflammatories after the meal. It also includes informing the patients' owners about the possible secondary clinical signs related to the use of anti-inflammatories and the immediate need to stop their administration along with the immediate medical visit.
- 2) The second branch aims to limit the movements of the spine. Thus, they are



recommended: keeping the patient for long periods in a closed cage, wearing the cervical collar, walking in the leash, changing the leash to the detriment of the harness, moving the food bowl to the chin region.

In the presented case, the encountered issues were represented by:

- Vomiting - secondary to tolperison administration
- Failure to comply with the second recommended therapeutic branch, which led to an increase in the period of administration of anti-inflammatories and the administration of anti-inflammatories in injectable variant, being impossible to administer them orally.

The efficiency of the conservative treatment can be concluded based on the clinical signs corroborated with the MRI with contrast substance performed post-treatment, the MRI attests the resorption of the degenerated disc material (10).

### 3. Conclusions

The conservative therapeutic management of cervical disc herniation can be successfully, considering that choosing this therapy requires careful selection of patients and education of their owners.

This case investigated one of the reasons for the recurrence of pain symptomatology during the conservative therapy of a patient with cervical disc extrusion.

The reason was the failure to observe the patient's movements.

Thus, the communication of the veterinarian - owner of the patient represents an important pillar in the management of the cervical hernia, being mandatory to emphasize that the improvement of the motility and the general state of the patient is not a sign of total recovery.

The second conclusion is the importance of the therapeutic compliance of the owners of the affected patients, since the administration of an adjacent medication (anti-inflammatory,

myorelaxant agents) implies the strict observance of the medical indications.

It is also very important to inform the owners about the possible side effects of anti-inflammatory drugs and what should be done when they occur (stopping treatment and consulting the veterinarian), but also emphasize the importance of their administration.

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