Rx, CT and MRI Advantages and Limits in Disc Disease Diagnosis in Dog

Eugenia Clara COROIANU, H. ELEFTERESCU

University of Agricultural Sciences and Veterinary Medicine, Faculty of Veterinary Medicine, Splaiul Independentei 105, Bucharest, clara_cla@yahoo.com

Abstract. A 4 years old dog suffering from spinal injuries was examend with Rx, CT and MRI for obtaining the most accurate diagnosis and terapeutical method. Each of the three methods has shown advantages and limits, but the MRI was the most useful method.

Keywords: disc disease, medulla, Rx, MRI, CT

INTRODUCTION

In spinal cord intervertebral disc disease pathology occur particular cases in wich the use of different investigation techniques can reveal a rare pathology, and never the less, the use of compared diagnosis methods leads to pointing out the advantages and limits of the applied techniques. (1, 5)

The present paper presents a cervical spine intervertebral disc injury case that has been investigated with three imagistic methods: Rx, CT and MRI.

MATERIALS AND METHODS

A 4 year old Pekinese female, at first paraplegic, then evolved in progressive tetraplegic signs with progressive sensibility lose was investigated.

For the Rx exam was used a Phillips Optimus 50, for the CT scan, Activion 16 and MRI a Vantage 1.5 Tesla.

For the CT and MRI exam, the animal was under Acepromazyne 0.3 mg/ kg neuroleptanalgesy and Ketamine 15mg/ kg anaesthesia.

RESULTS AND DISCUSSIONS

Although exceptional for hard tissues (bone), where the exam’s fidelity is very good, the Rx has it’s limits when it comes to soft tissues ( intervertebral discs, in this case), which are radio-transparent, therefore establishing a diagnosis is very difficult and only assumptions and diagnosis orientation can be made. (5, 6)

image1. Cervical spine, latero-lateral X-ray exposure
In the first image, analysing the Rx projection, at C6-C7 vertebral body, an osteofitosis can be observed on the ventral intervertebral ligament. The C4-C5, C5-C6 intervertebral disc related areas are reduced, which allows us to assume the existence of a disc dehydration process with an alleged hernia of either disc or pulp.

Also, CT exam was performed, and in the 2nd and 3rd image C5-C6 disc prolapse can be detected, especially in C6, with a 60% of the spinal canal occupied.

For the MRI exam a 1.5 Tesla Phillips was used, and the images obtained revealed very accurate the C5-C6 disc altered position, allowing us to determine the precise medullar stenosis degree. The foraminal narrowing due to osteofitosis processes that occurs in some cases can also be diagnosticated and located with high precision (images 4 and 5).

Gathering together all these data, a precise diagnosis and lesion localization could be established, so that a surgical procedure was performed in order to decompress and ensure the normal function of the spinal marrow. This procedure is called hemilaminectomy.

Unfortunately, the CT scan and MRI costs are very high, therefore unaffordable for the most (3).

In lack of CT scan and MRI, myelogram is the option. The myelogram is performed by injecting a contrast material (ISOVIST) in the arachnoid space, which allows localization of herniated disc. It’s not neglectible the fact that this technique is shockogenic and invasive and does not show lesions that may be present in bones, articular, intervertebral or discal areas, nor meningeal lesions. (4, 5).
CONCLUSIONS

1. In disc disease, the X-ray exam is only orientative
2. Although much more accurate then X-ray exam, the CT scan has it’s limits. Besides, there are situations in which the obtained image is not as clear as we wish it were, therefore the diagnosis might not be entirely correct.
3. MRI is the most efficient technique in spinal injuries diagnosis. Once the correct diagnosis is established, it helps the veterinarian to decide the most appropriate therapeutic technique (pharmaceutical and/or surgical) (2)

REFERENCES

5. Veterinary diagnostic imaging of the dog and cat, vol. I, Charles S Farrow, Mosby 2003