MYELOGRAPHY FOR THE DOG WITH THE USAGE OF OPTIRAY 350

R.C. PURDOIU, I. PAPUC, R. LACATUȘ

Faculty of Veterinary Medicine Cluj-Napoca, 3-5 Manastur Street,
400372, Cluj-Napoca, Romania
E-mail: rlacatus2003@yahoo.com

Summary

In order to visualize the spinal cord and any changes that occur on anatomical level, the usage of contrast substances is necessary. The radiological examination of the spinal cord and of the spinal channel, through the usage of contrast substances, is called myelography.

Through the usage of the myelography method it is possible to explore cervical, lumbar regions, as well as the sac of the sacral spine. Upon treating and diagnosing, this clinical method is indicated, if traditional x-rays do not show spinal lesions, or when clinical signs contradict x-ray results, and also when multiple lesions appear and there is the need for a more accurate determination of the damaged element, necessary upon surgery. It may also be used when more information is needed to establish a prognosis.

Key words: myelography, Optiray 350, spinal channel

The current article sets out to underline the importance of using non-ionizing contrast substances Optiray 350 during the myelography of the dog. Also, it is necessary to show the importance of Optiray 350 upon diagnosing damages in the nervous system, to establish situations when the usage of contrast substance (Optiray 350) is imposed, especially during radiological tests of the spinal cord. The identification of optimal parameters for using myelography in the cervical and lumbar region or the location where the substance is to be induced to achieve clear and quality pictures necessary to establish a diagnosis, is also of a crucial relevance. As part of our analysis the issues of the substance’s effect on the physiological parameters and the time frame for eliminating Optiray 350 will also be analyzed in this article.

Materials and methods

Research on the subarachnoid mater through non-ionizing contrast substance Optiray 350 was done on a number of 10 dogs, different in size, age and gender.

The Radiology Laboratory at the Faculty of Veterinary Medicine in Cluj-Napoca was used to conduct our research.

The animals used in our research took part, initially, in a radiological examination of the spinal cord, without the usage of contrast substances. This was done to underline the probable spinal damage which can be identified through this
method. The administrating doses of contrast substance were applied on 5 patients according to body size. It was also to be observed what the side effects were, determined by the substance on the subarachnoid mater. Optiray 350 was used in an undiluted form.

Two categories were elaborated accordingly to the location of injecting the substance Optiray:

a) Myelographies can be realized by lumbar puncture and inducing the substance into the spinal channel, hence the curved position of the dog’s head. The needle will be slowly inserted into the occipital-atloidal or atlo-axoidal space. The forefront of the needle is being inserted in the direction of the dog’s nose;

b) Myelographies executed through lumbar puncture. The non-ionizing substance is being introduced in the lumbar part of the spinal channel;

The chosen location for the puncture (cervical and lumbar area) was treated according to the asepsis and antisepsis standards (shaving, washing, grooming). Patients were given a dose of 1% Atropin 0.02 ml/kg after administrating Acepromazin associated to Ketamin (10 mg/kg.corp) to obtain neuroleptanalgesia.

The spinal needles used in the procedure were of 22 – 20 G with a stylet for minimising perimedular tissue damage. Other needles used in the procedure had the length of 70-100 mm with a diameter of 0.7 mm and a short opening.

The animals that took part in the procedure where kept under observation for 48 hours in order to prevent and possibly treat any side effects.

Results and discussions

Trough the conventional x-ray method we were able to diagnose lesions caused by: spondilosis and deformed spondilosis, vertebra fractures, discal-vertebral lesions (sprains and subsprains, discal prolapses, discal atrophy and the ossification of the intervertebral disc, spondiloarthrosis and Wobbler syndrome).

Cervical myelography

Puncture areas:
- Occipital-atloidal puncture;
- Atlo-axoidal puncture;

An equal amount of cerebrospinal fluid and contrast substance is being injected through the plastic tube connected to the puncture needle

The injected dosage (contrast substance) in the subarachnoidal space in the cervical region was of 0.2 – 0.45 ml/kg with an expose rate of 2 – 10 – 20 – 40 minutes from administrating the doses. In the aftermath of the procedure, the needle was slowly extracted and the animal was slightly moved from right to left with the purpose to facilitate the substance’ entrance in the spinal channel.

The parameters were established according to the size of the animal: 55-60 kV, 25-40 mAs.
Different factors caused by trauma were observed in the medullar compressions (Fig. 3), lumbar-vertebral discopathies (Fig.4), Wobbler syndrome (Fig.5), the spinal cord’s subsprains or spinal cord fractures.

Fig. 1. Intervertebral disc ossification at the level of T10 – T11 – T12

Fig. 2. Lumbar discopathy. Tendence in hernia on the intervertebral disc.

Fig. 3. The compression of L7 due to a fracture: the compression of the vertebral bone

Fig. 4. Lumbar discopathy L5 – L6 – L7

Fig. 5. Wobbler Syndrome at the dog
Lumbar Myelography

In order to induce the substance in the lumbar area, the puncture had to be executed between the vertebrae L3 – L4 or L5 – L6. It is also possible to use the space between L6 – L7 for this procedure. The lumbar puncture has a lateral-medial trajectory until touching the inner wall of the spinal channel; hence it will be executed near the dorsal apophysis (ischial tuberosity).

The follow-up x-ray is needed to reassure us of the fact that the needle is being inserted in the spinal channel. The quantity of the contrast substance is of 0.2-0.5 ml.

Radiological exposures were allowed 1 minute, 10 minutes and 30 minutes into the administrated doses.
The parameters used during the procedures were established according to the size of the animal: 55-73 kV, respectively 25-40 mAs.

Conclusions

Prior to the radiological examination it is necessary to examine each segment of the spinal cord.

The procedure of injecting the substance should be slow, hence the necessary time span of up to 5 minutes.

Doses vary according to the place of administering the substance. Therefore, in the cervical region the doses can achieve the level of 0.45 ml/kg and for the injection in the lumbar area the doses can be of 0.2 ml/kg.

Radiological exposures can be done with the purpose of following-up on the progress. Also 1, 10, 15 and 30 minutes into inducing the substance, x-rays will show and underline the different spinal cord segments.

Exposure parameters were different. Excellent images were obtained by using a frame of 50 – 60 kV but also of 25 – 40 mAs, according to the animal size.

The optimal area to induce the contrast substance Optiray 350 is the cervical area, the atlanto-axial intervertebral space. Upon administrating the substance, the animal is lifted to help with the substance’ diffusion.

Inducing the substance into the occipital-atloidal area can be done following procedures but with some major risk.

The usage of non-ionizing substance in order to visualize the spinal cord and spinal channel is indicated upon cervical intervertebral discopathy, disc protusia type I and II, lumbar intervertebral discopathy, neoplasia, hematoma, internedula abscesses.
A slight tachycardia and tachypnea was observed upon administrating Optiray 350. A return to normal parameters has been observed 24 hours after administrating the contrast substance.

References