

# RADIOFREQUENCY AT 448 kHz FOR THE TREATMENT OF MUSCLE SPASTICITY IN A DOG WITH C2-C3 SPINAL CORD INJURY



ARENA M.<sup>1</sup> 2018.

<sup>1</sup>Centro Veterinario de Rehabilitación e Hidroterapia FISIODOG, León, Spain.

## BACKGROUND

A 6.5-year-old, non-sterilised male Dalmatian (Coco) was seen at the clinic, who suffered ataxia of all four extremities for almost one year, followed by tetraparesis. Magnetic resonance imaging revealed cervical stenosis with C2-C3 disc protrusion (Image 1).

On day 5 after surgery (Cervical Ventral Slot procedure), the patient was referred to the Rehabilitation Department with non-ambulatory tetraparesis and spasticity of the front limbs, neck pain, generalised muscle atrophy, and increased spinal reflexes in all four limbs (Image 2).

The use of radiofrequency in human rehabilitation is widely spread and recognized (1). Its main effects are based on its ability to increase the temperature of the tissues on which it is applied (2). Among the many types of applications, it is worth mentioning its use in spinal decompression protocols (3), which has led us to consider the use of radiofrequency in the treatment of muscle spasticity in dogs.

## OBJECTIVE

To reduce patient pain and stiffness in the short term and, in a second phase, to correct muscle atrophy and restore motor capacity.

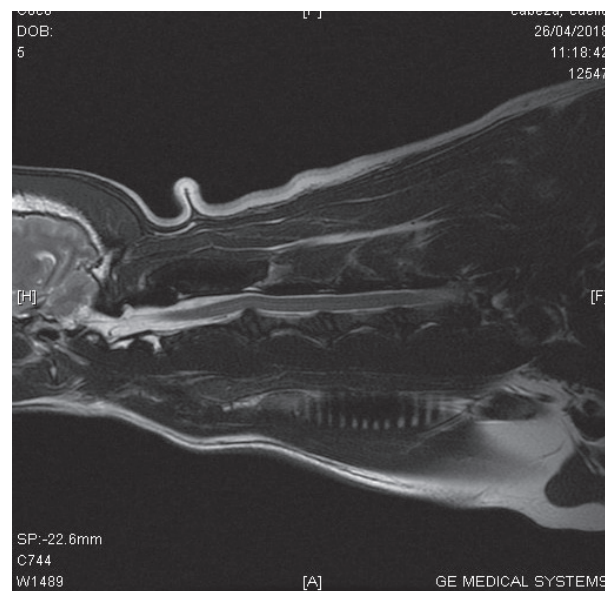
## MATERIAL AND METHODS

A monopolar radiofrequency current emitting system operating at 448 kHz (INDIBA® Animal Health [VET 705]) was used. The treatment was applied using two types of electrodes: capacitive (CAP) and resistive (RES).

### Treatment protocol:

Radiofrequency was applied to the neck (Image 3) and to the front limbs, treating the muscles from the carpal region to the shoulder, and mobilising the limb.

Twelve 22-minute treatment sessions were carried out one per day on consecutive days, followed by sessions on alternate days up until day 21 post-surgery (14 sessions in total).



**Image 1.** Magnetic resonance imaging revealing cervical stenosis with C2-C3 disc protrusion.



**Image 2.** Coco on the first day of rehabilitation, 5 days after surgery.



**Image 3.** Application of radiofrequency therapy in RES mode in the neck region.

## RESULTS

Following the sixth day of treatment, the patient was able to adopt sternal decubitus without help, and had recovered much neck mobility (Image 4). Spasticity of the front limbs was seen to have decreased notoriously, allowing almost complete passive flexing of all the joints. From this moment, radiofrequency was supplemented with assisted hydrotherapy using an underwater treadmill to correct the muscle atrophy and improve patient proprioception and balance.

Fifteen days after surgery, Coco was able to stand up alone and walk with the help of a harness. The spasticity had disappeared and the patient started to regain muscle strength. Twenty-two days after surgery, the patient was able to walk without help, go up ramps and get past obstacles, though with some instability (Image 5).

In this patient, the tissue temperature generated by the radiofrequency treatment has had a clear relaxing effect. It is important to highlight that this technique is non-invasive and is completely safe for both the canine patient and the professional.

## DISCUSSION AND CONCLUSION

The use of radiofrequency at 448 kHz in this patient has been based on two main approaches: on one hand, at neck level the goal was to lessen tissue inflammation and produce a biostimulating effect as soon as possible. On the other hand, in relation to the front limbs, the main goal was to reduce spasticity.

In clinical practice, each patient implies many variables. In Coco's specific case, we observed a clearly shortened evolution of the clinical signs compared with similar cases of C1-C5 cervical spinal cord injuries previously subjected to surgical treatment. This suggests that the cellular biostimulating effects afforded by radiofrequency therapy at 448 kHz are able to accelerate the physiological recovery processes in these patients. In turn, the improved oxygenation of the affected muscles results in greater and better recovery of muscle function.

## REFERENCES

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**Image 4.** From the sixth day of radiofrequency treatment, the patient was able to adopt sternal decubitus without help, and had recovered much neck mobility.



**Image 5.** This image obtained 22 days after surgery shows the strength the patient was able to display while taking a walk.