CT EVALUATION OF RETROBULBAR FILLING FOR ENTROPION RESOLUTION IN DOGS: A PRELIMINARY CADAVERIC STUDY

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INTRODUCTION

A new therapeutic approach for entropion may be retrobulbar filling using autologous adipose tissue. This prospective, exploratory study aims to standardize the modality of intraconal filling and evaluate the degree of eyeball displacement by computed tomography (CT).

MATERIALS AND METHODS

Skull CT was performed on six dog cadavers before and after intraconal injection of two 5% iodinated, viscoelastic solutions (3% sodium hyaluronate and carmellose sodium gel with lidocaine 2,5%), one per eye, using an ultrasound-guided supratemporal approach[1] and verifying the correct needle position by CT scan (Figure 1). The volume to be injected was estimated using formulas found in the literature for retrobulbar cone anaesthesia.[2] Eyeball displacement was estimated using two methods, named M_1 and M_2.

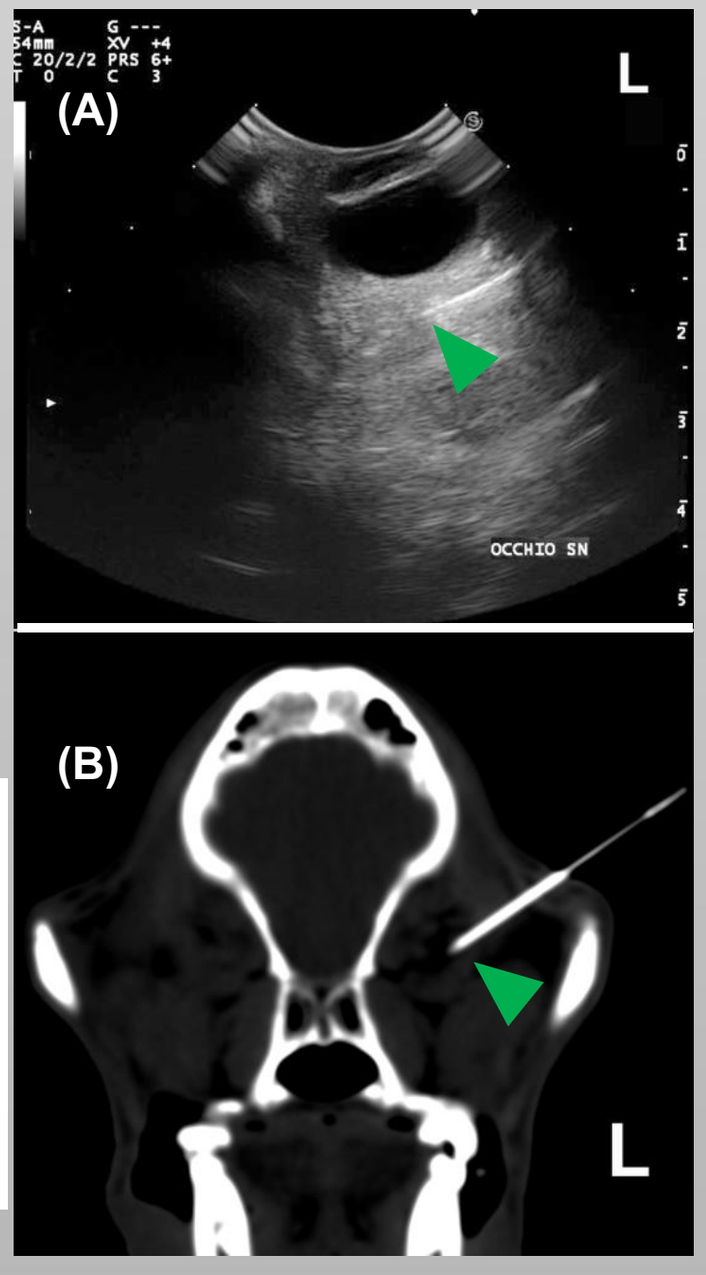

FIGURE 1: (A) Ultrasonographic image showing the position of the needle tip (green arrowhead) in the Le retrobulbar cone before the injection. **(B)** Transverse CT image of the skull obtained after needle insertion (green arrowhead) to assess the correct positioning within the Le retrobulbar space

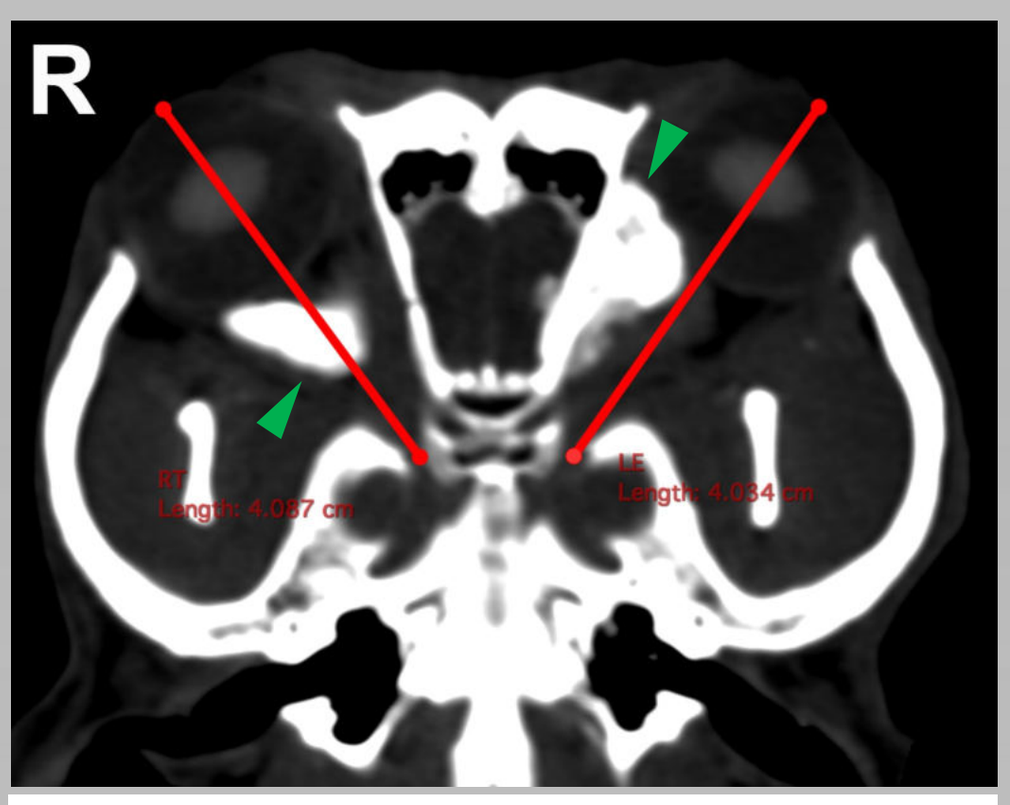

FIGURE 2: Dorsal-oblique post-injection MPR image of the skull. In M_1 the eyeball displacement was evaluated on a dorsal-oblique plane, drawing a line from the optic foramen to the ipsilateral corneal surface (red lines). The contrast media mixed with the viscoelastic solutions (green arrowheads) is visible caudally (Rt) and caudo-medially to the eyeball

In M_1, the rostro-lateral displacement was evaluated using multiplanar reconstruction (MPR). The sagittal plane was centred on the eyeballs and the dorsal plane tilted to fully expose the retrobulbar cone and optic foramen. Then, the rostro-lateral displacement was assessed tracing a line from the optic foramen to the ipsilateral corneal surface (Figure 2).

In M_2 the lateral displacement was assessed on the axial plane, drawing a line from the frontal to the zygomatic bone and then from this line to the corneal surface, while the rostral displacement was evaluated on the dorsal plane, drawing a line from the maxillary to the zygomatic bone and then from this line to the corneal surface (Figure 3).

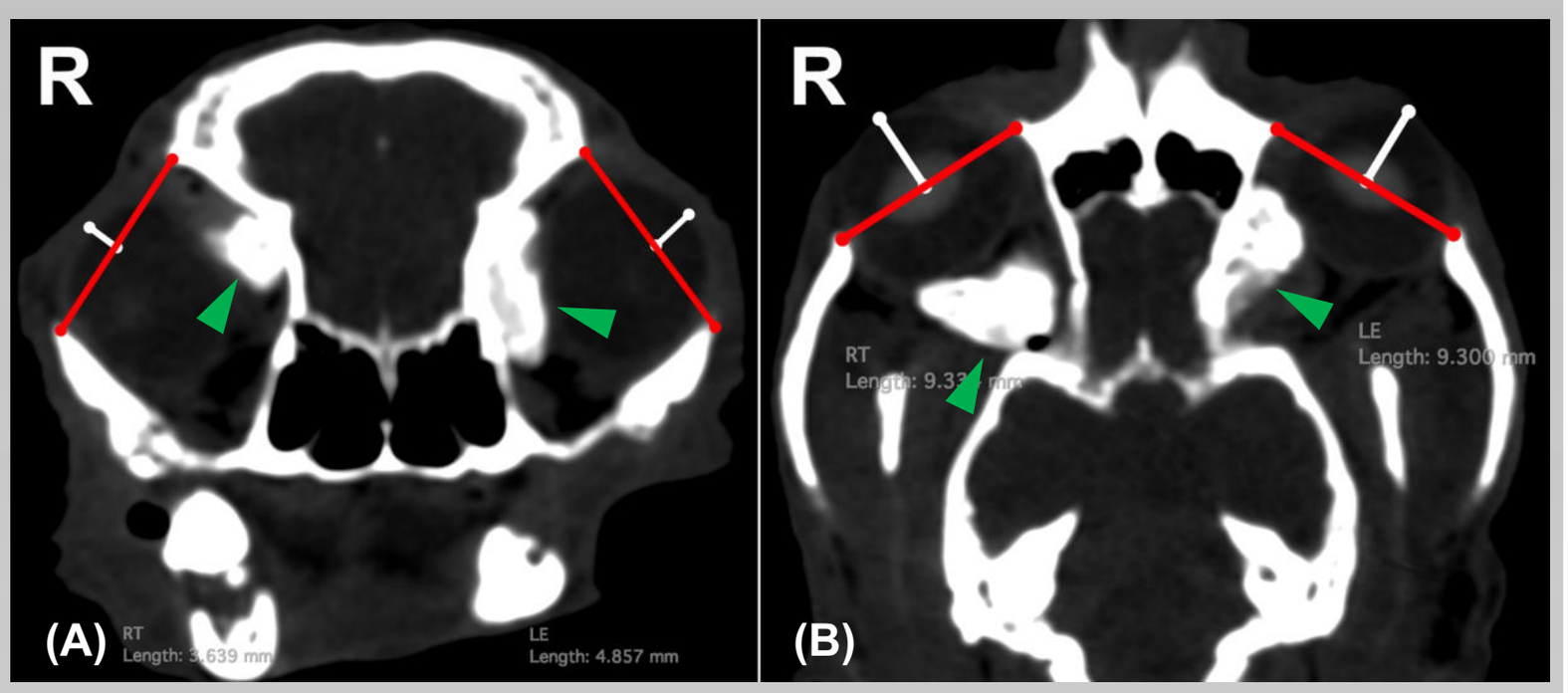

FIGURE 3: Transverse **(A)** and dorsal-oblique **(B)** post-injection MPR images of the skull of the same dog of figure 1. In M2, the lateral displacement was assessed on the axial plane (A), drawing a line from the frontal to the zygomatic bone (red lines) and then from this line to the corneal surface (white lines). The rostral displacement was evaluated on the dorsal plane (B), drawing a line from the maxillary to the zygomatic bone (red lines) and then from this line to the corneal surface (white lines). The contrast media mixed with the viscoelastic solutions (red arrowheads) is visible caudally (Rt) and caudomedial (Le) to the eyeball

RESULTS

For both eyeballs, the *t-test* revealed a significant rostro-lateral ($P = 0.003$) displacement (M_1) and rostral ($P < 0.001$) and lateral ($P < 0.001$) displacement (M_2). There were no differences between the two materials.

DISCUSSION

Although the slight eyeball displacement, the retrobulbar filling can lead to entropion resolution. Compared to M_1, M_2 has better defined anatomical landmarks and can assess simultaneously rostral and lateral eyeball displacement. Further, preclinical studies are needed to assess retrobulbar filling efficacy and safety.

REFERENCES

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