COMPUTED TOMOGRAPHIC EVALUATION OF THE ULNAR TROCHLEAR NOTCH AS A PREDICTOR OF ELBOW DYSPLASIA IN 19 GROWING GERMAN SHEPHERDS

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Abstract

Introduction

Ulnar trochlear notch sclerosis (TNS) is an important secondary sign detected in radiography for the diagnosis of canine elbow dysplasia (ED); some authors suppose its role as an early marker of the disease[1,2]. Computed tomography (CT) is currently considered a reliable early diagnostic technique for ED compared to standard radiography. The aim of this study was to assess TNS in a group of growing dogs, through the use of particular regions of interest (ROIs) in the ulna (measured in Hounsfield units, HU), while determining their repeatability and supposed predictive value at 6 months of age in relation to the final ED score at 12 months.

Methods

In this study, the elbow joints of 19 growing German shepherd dogs underwent CT examinations, at 6 and 12 months of age. Two ROIs were chosen with a standardized multiplanar reconstruction positioning and measured at the proximal and distal aspect of the ulnar trochlear notch, collecting the mean CT attenuation values. Measurements were repeated three times by two operators of different experience.
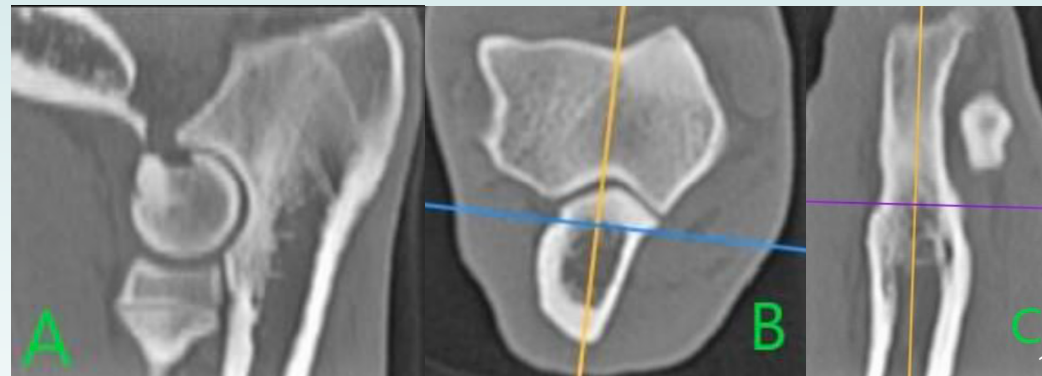

Fig.1 : CT scan of a 12 months old canine elbow, standardized multiplanar reconstruction for collecting ROI values; sagittal view (A), transverse view (B) and dorsal view (C).

Fig.2-3 : CT scan of a 6 months old left canine elbow (1), evaluated as moderate proximal sclerosis, and the same elbow at 12 months old (2) evaluated as severe sclerosis; sagittal view.
Proximal ROI (A) and distal ROI (B).

Results

Intra-observer agreement was "substantial" to "almost perfect", inter-observer agreement was mostly "substantial", but "moderate" regarding proximal ROI measurements at 6 months. However, in both observers' measurements, proximal ROI resulted in having a significant correlation to the final ED score of the elbows at 12 months, suggesting its potential predictive value.

Conclusion

TNS in our study proved it can be objectively assessed through CT by different operators and may be an early diagnostic indicator of ED in this series, however further studies are needed.

References

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2. Villamonte-Chevalier, A., Dingemanse, W., Broeckx, B. J. G., Van Caelenberg, A., Agut, A., Duchateau, L., Gielen, I. (2016). Bone density of elbow joints in Labrador retrievers and Golden retrievers: Comparison of healthy joints and joints with medial coronoid disease. The Veterinary Journal, 216, 1-7.