Delayed endochondral ossification in early medial coronoid disease (MCD): a morphological and immunohistochemical evaluation in growing Labrador retrievers

ABSTRACT

Medial coronoid disease (MCD) is a common joint disease of dogs. It has a multifactorial aetiology, but the relationship between known causal factors and the disease has yet to be elucidated. As most of the published literature is clinical and it reports changes associated with advanced disease, it is not known whether the changes reflect the cause or consequences of the condition. The aim of this study was to investigate early micromorphological changes occurring in articular cartilage and to describe the postnatal development of the medial coronoid process (MCP) before MCD develops.

Three litters of MCD-prone young Labrador retrievers were purpose-bred from a dam and two sires with MCD. Comparisons of the micromorphological appearance of the MCP in MCD-negative and MCD-positive joints demonstrated that MCD was initially associated with a disturbance of endochondral ossification, namely a delay in the calcification of the calcifying zone, without concurrent abnormalities in the superficial layers of the joint cartilage. Cartilage canals containing patent blood vessels were only detected in dogs <12 weeks old, but the role of these channels in impaired ossification requires further investigation. Retained hyaline cartilage might ossify as the disease progresses, but weak areas can develop into cracks between the retained cartilage and the subchondral bone, leading to cleft formation and fragmentation of the MCP.

Keyword: Labrador retrievers; Endochondral ossification; Medial coronoid disease; Medial coronoid process; Retained hyaline cartilage