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Ultrasonography of the Elbow and Shoulder

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Introduction

Ultrasonographic examination of the elbow and shoulder yields information about the soft tissue structures of elbow and shoulder joints, complementing the information that is obtained through radiography and nuclear scintigraphy. These areas have been traditionally difficult to examine properly in the field with radiography, and ultrasonographic examination can be helpful for the practitioner to obtain diagnostic information about conditions related to these areas. An upper limb lameness, a history of trauma, a swelling or local deformation, a hematoma, an abscess, a draining tract, or a lameness localized to the joint are all common indications for ultrasonography of the shoulder and elbow. In cases in which the lameness is localized to the elbow, ultrasonography is considered more sensitive than radiography for detection of early bone remodeling that is usually associated with osteoarthritis. As an ultrasound examination of the shoulder and the elbow is less commonly performed than in other regions, it is recommended to prepare both limbs in order to use the opposite limb for comparison. Sedation is usually not needed in adults, while young animals usually require a low dose of sedation.

Elbow

Preparation and Scanning Technique

Routine skin preparation is used. Diagnostic images can be obtained with high-frequency linear transducers (5–10 MHz), but a convex probe can be useful at the cranial aspect of the elbow to study the distal insertion of the biceps brachii tendon. In cases of ultrasound-guided injections, a micro-convex probe is suitable. A standoff pad is required to improve contact with the lateral aspect of the elbow during examination of the lateral collateral ligament of the elbow joint.

The elbow joint can be scanned from cranial, lateral, and medial approaches. Ultrasonography of the elbow is performed in the weightbearing position, but the evaluation of the medial aspect of the elbow joint is limited in this position. To allow better positioning of the transducer in this area the limb should be pulled forward, but nevertheless medial access in not easy.

A complete sonographic examination of the elbow should involve the lateral and medial collateral ligaments, the triceps brachii tendon, the proximal tendon of the ulnaris lateralis, the distal biceps brachii tendon, the joint space, and the articular cartilage. Examination of the lateral collateral ligament, the triceps brachii tendon, the proximal tendon of the ulnaris lateralis, and the articular cartilage of the humeral trochlea is straightforward. The medial collateral ligament and the distal biceps brachii tendon require more expertise to assess.

Ultrasonographic Anatomy and Ultrasonographic Abnormalities

Elbow Joint

The elbow joint is formed by the articulation of the distal humerus with the radius and ulna. The distal humerus has two condyles that are unequal in size, with the medial condyle being significantly larger.

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