

## **IT IS SHOULDER LAMENESS, BUT RADIOGRAPHS ARE “NORMAL”. WHAT ULTRASOUND CAN TELL US**

### **Abstract**

Musculoskeletal ultrasound (US) is a rapidly growing field within the veterinary caseload. Ultrasound has been commonly used in equine and human medicine and is becoming routinely performed in small animal patients, due to the increased soft tissue injuries, especially in high-level sportive dogs and chronically osteoarthritic patients. Agility, disk dog, obedience, dance dog, and sheepdog are some of the fast-growing canine sports, and with the increased performance, there is a higher risk for teno-muscular injuries. In athletes, both acute (with muscle tear and tendon strain being the most common) and chronic, due to overuse injuries could be present. Ultrasound should never be the first diagnostic imaging modality for them, but should always be performed after a specialized orthopedic and radiographic evaluation. Sportive patients often have a negative or ambiguous orthopedic evaluation and are within normal limits radiographs. They often became sound with rest and relapsed as soon as they go back to work. The knowledge of the chronic changes induced by these sports is fundamental for the ultrasonographer that wants to deal with sportive patients. For example, the chronic overuse of supraspinatus tendon in patients performing agility often increases the size of the fibro-cartilaginous humeral insertion, which affects the biceps tendon mobility (Fig. 1). Repeated minor hemorrhages are common, often becoming mineralized spots. These changes are often not painful and of no clinical meaning until the increased size entraps the shoulder articular capsule and the underlying biceps tendon. The friction of these two structures naturally close, but that shouldn't interfere, can determine a different range of damages, from acute tendonitis on the biceps or supraspinatus tendon to partial tendinous rupture. It is not difficult to diagnose a damaged or inflamed tendon, but if the treatment is only aimed at recovering the damage and not reducing the diameter of the supraspinatus insertion, the patient will be back to being lame as soon as will start training. The orthopedic surgeon, the physiotherapist, and the ultrasonographer need to have a medical discussion to propose a proper treatment plan. A change in sportive protocol and training could be necessary to avoid excessive overload on the supraspinatus tendon and recurrence of the lesions.

Another class of patients in which US can play a relevant role in diagnosis and planning treatment are patients with chronic elbow osteoarthritis. The change in posture due to the decreased elbow ROM (range of motion) and chronic pain results in altered gait balance and pressures. Because of that, over time, a lot of patients develop shoulder or carpal acute or chronic tendonitis. That usually will result in a severe worsening of their pain condition with failed response to NSAD. Again the radiographic study of the shoulders will be unremarkable, but the pain will be present on physical

examination. Physiotherapists are usually involved in the pain management of arthritic patients, but their treatment will be more efficient if the correct diagnosis is made. The US can define which structures need treatment and is particularly useful in pain management by delivering ultrasound-guided medications. There are several advantages and disadvantages associated with US in this field. The US is relatively cheap, available, and doesn't require sedation unless the patient is restless and is accurate in differentiating an acute from a chronic tendon or muscle injury. Unfortunately, the US is operator-dependent, and a long learning curve is needed to make this modality the toll that needs to be.

Fig. 1) Example of a within normal range shoulder compared with a sportive patient with chronic supraspinatus tendinopathy and adhesion with the joint capsule and biceps tendon. This condition causes severe lameness in the morning that reduces with mild exercise but worsened with more. A) Normal shoulder, B) affected shoulder.

