SUPRASPINATUS TENDINOSIS AND MINERALIZATION: SAME DISEASE TWO FACES?
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Key points
- Supraspinatus tendinosis is characterized by an enlarged tendon insertion with myxomatous degeneration revealed by fluid intensity on MR imaging, and no inflammatory changes.
- Supraspinatus tendinosis in dogs shows identical clinical presentation to the previously recognized calcifying supraspinatus tendinopathy, except the lack of a macroscopic calcified lesion.
- The enlarged tendon may interfere with the function of the biceps tendon.
- Surgical debridement of supraspinatus tendinosis may be of higher importance in dogs than in humans due to the anatomical arrangement of the canine cranial shoulder.

Chronic degenerative tendinopathy, tendinosis, is commonly seen in the common calcaneal (Achilles), patellar and supraspinatus tendons in humans. Though the etiology is unknown, overuse injury has been suggested and supported by findings of experimental animal models. The disorder is characterized by persistent, activity-related pain and swelling localized to the affected tendon. Classical histopathological changes include disorganized collagen fibers that lack reflectivity under polarized light and a prominent myxomatous degeneration without calcification or inflammatory changes. A disorder, very similar to human tendinosis, of the supraspinatus tendon in dogs has been reported from our institution.1,2

Mineralized Supraspinatus Tendinopathy in Dogs.
The main supraspinatus tendon abnormality previously recognized in dogs has been mineralization (calcification) of the tendon insertion as described by Flo and Middelton.3 Long term outcome after surgical treatment was presented a decade later and showed good to excellent outcome (mild intermittent lameness to normal function) in 80 to 90 % of operated cases and in all of 3 cases treated conservatively (rest and NSAIDs).4 Extracorporeal shock wave therapy resolved lameness in 2 dogs re-examined at 20 and 49 days, respectively.5 Medium to large breed adult dogs are most commonly affected and the lameness tends to show an insidious onset resulting in an intermittent or progressive weight-bearing forelimb lameness worsening during or after exercise. On physical examination many dogs show reluctance or pain during shoulder flexion or, less often, by deep palpation with pressure placed over the cranio-medial greater tubercle. In some cases pain cannot be elicited by neither shoulder manipulation or by digital palpation of the tendon. The mineralizations are in general not large enough to be palpated but are revealed by diagnostic imaging. (Figure 1) Histopathological examination of tissue resected in dogs with mineralization of supraspinatus tendon reveals fibrocartilaginous metaplasia with dystrophic mineralization of the tendon. Collagen bundles are often haphazardly arranged and collagen fibers separated by a myxomatous matrix. There are no or minimal inflammatory changes.
Supraspinatus Tendinosis; Non-Mineralized Supraspinatus Tendinopathy in Dogs

Clinical presentation of this disorder is very similar to that described for the mineralized supraspinatus tendinopathy. However, radiographic imaging is unrewarding. Magnetic resonance (MR) imaging provides an excellent imaging modality to demonstrate an enlarged supraspinatus tendon without calcification. The myxomatous degeneration shows a high fluid content which is readily demonstrated on T2 weighted images. (Figure 2) Ultrasound examination is also of value, if the operator is familiar with the disorder.

Figure 2: Axial T2-weighted image of the right proximal humerus. The supraspinatus tendon of insertion show increased mass and signal intensity, consistent with increased fluid content bilaterally (chevrons). The increased mass appears to compress the bicipital groove and the biceps tendon (solid arrow). Histopathology in this case revealed tendinosis-like changes with no major foci of mineralization or inflammatory changes.

Surgical treatment with the goal of resecting the medial part of the tendon which extends into the bicipital groove was evaluated in a series of dogs and showed good to excellent outcome in 7/8 (88%) cases. Commonly the lameness greatly improves within 14 days, sooner than tendon healing is completed, suggesting that decompression of the bicipital groove may play a role in the recovery. Histopathological changes are identical to those of the mineralized disorder, with the important exception being the lack of gross mineralized foci. (Figure 3) However, microscopic foci of mineralization have been observed also in cases of non-mineralized tendinopathy.
Figure 3: Histological view (H/E) shows myxomatous degeneration as an increased extracellular matrix separating the collagen bundles (arrows) and chondroid metaplasia. These findings are consistent with supraspinatus tendinosis.

References