REPORTING SERVICE: CT

Report number: VETCT-ANON

Report date: XXXX

Owner: WRINKLES Rescue

Patient ID: ANON

Patient: Maggie

Species: Canine

Breed: Shar Pei

Sex: Female Entire

Age: 1 year, 7 months (13-November-2022)

Clinical History

Rescue - presented with deformed left fore limb

Questions to be answered

Help with potential surgical correction

Number of series / images: 7 / 3387

Series: DOSE REPORT, SCOUTS, RT FORELIMB BONE, LT FORELIMB SOFT, SCOUTS, RT FORELIMB SOFT, LT ELBOW BONE

Anatomic regions: Elbow, Carpus/foot

Details of Study & Technical Comments

A CT of the elbows and carpi/feet is available for interpretation. The study consists of pre-contrast series processed with soft tissue and bone filters. No post-contrast series have been received.

The study is of diagnostic quality.

Diagnostic Interpretation

Elbow - Left

There is a mild varus deformity of the left elbow.

The left elbow joint is incongruent, with a step formation between the proximal radius and ulna (Figure 1, left image, purple arrow), as well as moderate widening of the lateral aspect of the humeroulnar joint (Figure 1, light blue arrows).

The medial coronoid process is mildly rounded in shape, but has normal attenuation and is smoothly outlined. The anconeal process (Figure 1, left image, blue asterisk) has normal attenuation, shape, and margination. The remaining joint surfaces are also smooth, with normal subchondral bone attenuation.

There is no obvious joint effusion, and the muscles of the distal brachium and proximal antebrachium have normal attenuation. There is however a large periosteal spur formation on the craniodistal aspect of the humerus, between the biceps brachii and brachialis muscles, in the region of insertion of the cleidobrachialis muscle (Figure 3, left image, red arrow).

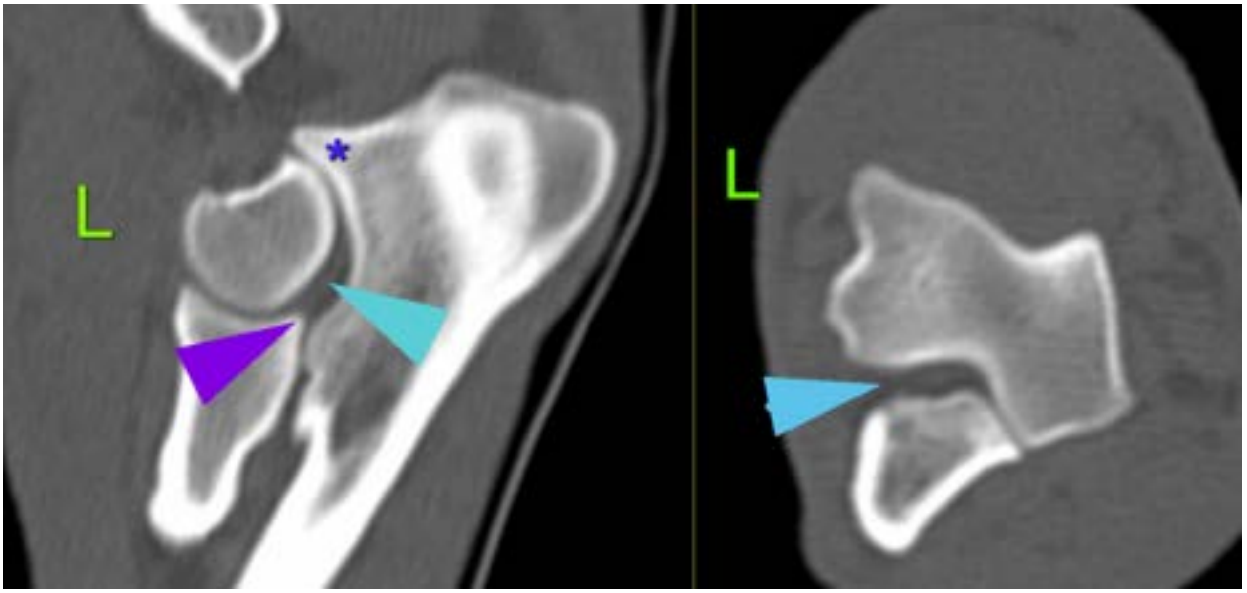

Figure 1

Elbow - Right

There is a mild varus deformity of the right elbow.

The right elbow joint is incongruent, with marked widening of the proximal radioulnar joint space (Figure 2, pink arrow), as well as marked widening of the caudolateral aspect of the humeroulnar joint space (Figure 2, and Figure 4, light blue arrows). There is a mild step formation between the proximal radius and ulna.

The anconeal process is irregular in shape, heterogeneous in a enuation, and has moderate periosteal new bone formation (Figure 2, orange arrow). There is a heterogeneously sclerotic to hypoa enuating line running through the base of the anconeal process (Figure 2, red arrow).

There is mild periosteal new bone formation (Figure 2, and Figure 4, green arrows) on the cranial aspect of the radial head and the medial and lateral humeral epicondyles. There is mild thickening of the articular soft tissues, and there is a focal mineralization of the soft tissues on the proximal aspect of the anconeal process.

The medial coronoid process is considered within normal limits.

Figure 2

Carpus/foot - Left

There is marked medial bowing of the left distal radius (Figure 3, dark blue arrow), as well as marked craniocaudal flattening of the bone. A similar flattening of the ulna is also seen. There are moderate to marked periosteal spur formations (Figure 3, green arrows) on the caudomedial surfaces of the mid- to distal radial and ulnar diaphyses, and milder spur formations are also seen on the cranial aspects of the cranial and lateral aspects of these bones. New bone formation is also seen on the margins of the grooves for the tendons of the extensor carpi radialis, extensor digitorum communis, and abductor pollicis longus muscles (Figure 3, green arrows).

There is a marked valgus deformity of the left carpus (Figure 3, pink arrows), with a marked lateroproximal to mediodistal angling of the antebrachiocarpal joint, as well as mild outward rotation of the manus relative to the distal antebrachium.

There is a shortening of the ulna, with distraction of the lateral styloid process (Figure 3, right image, green asterisk) of the ulna from the carpus, causing moderate widening of the joints between the ulna and the ulnar and accessory carpal bones (Figure 3, right image, yellow arrows). There is mild to moderate periosteal new bone formation on the lateral and distal surfaces of the accessory carpal bone, as well as on the lateral surface of the ulnar carpal bone. A faintly mineralized, ovoid structure measuring 3 mm in maximum length is seen between the distolateral aspect of the lateral styloid process and the proximal caudolateral ulnar and the proximal craniolateral accessory carpal bone.

There is mild periosteal new bone formation on the dorsal aspect of the distal row of carpal bones (Figure 3, right image, orange arrow).

The remaining carpal bones are considered within normal limits, as are the metacarpals, metacarpophalangeal sesamoids, and phalanges. The intercarpal, carpometacarpal, metacarpophalangeal, and interphalangeal joints are also considered within normal limits, as are the soft tissues of the metacarpus and digits.

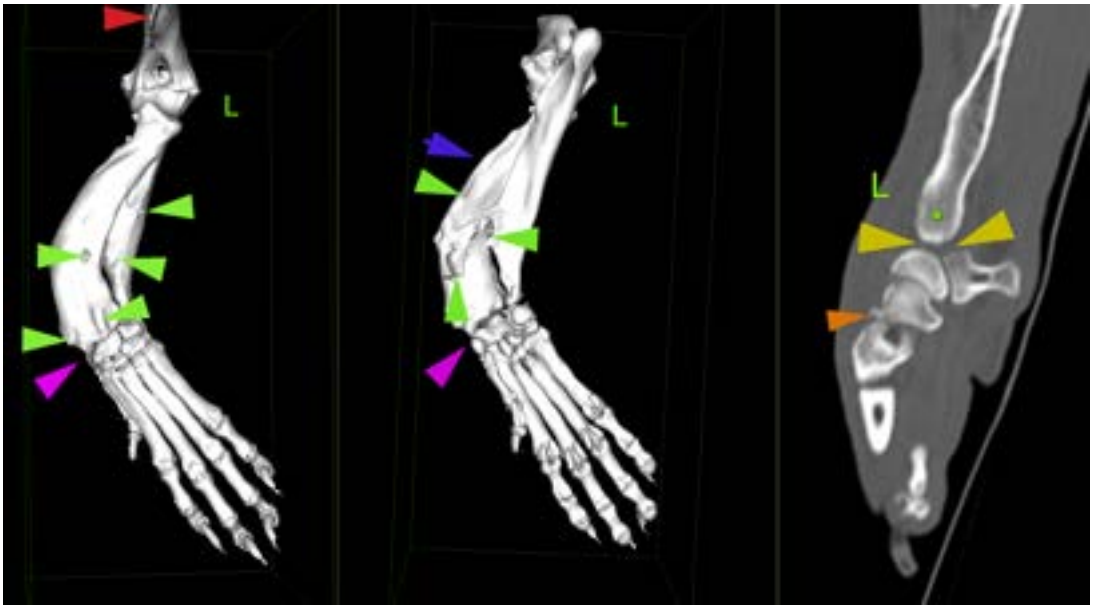

Figure 3

Carpus/foot - Right

There is mild cranial bowing of the radius and ulna (Figure 4, left image, dark blue arrows), and there is mild widening of the joint space between the lateral styloid process of the ulna and the ulnar carpal bone (Figure 4, left image, yellow arrow).

There is a mild valgus deformity of the right carpus (Figure 4, right image, pink arrow), with mild proximolateral to distomedial angling of the antebrachiocarpal joint space. The joint margins of the antebrachiocarpal joint are however smooth, with normal subchondral bone attenuation.

The intercarpal, carpometacarpal, metacarpophalangeal, and interphalangeal joints are considered within normal limits, as are the carpal bones, metacarpals, metacarpophalangeal sesamoids, and phalanges, as well as the soft tissues of the metacarpus and digits.

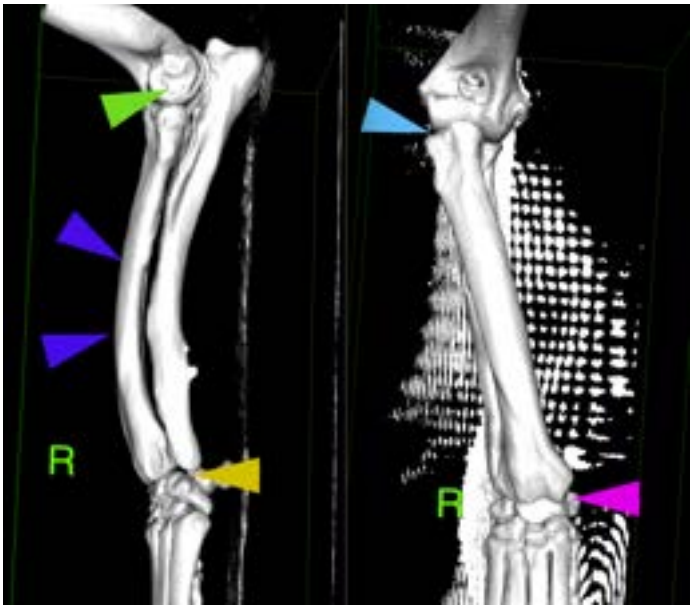

Figure 4

Conclusions

- **Bilateral angular limb deformity of the antebrachium** - trauma vs developmental; see comments.
    - LEFT: **mild elbow varus, marked medial bowing of radius and flattening of radius and ulna, marked carpus valgus, and outward rotation of manus**
    - RIGHT: **mild elbow varus, mild radial procurvatum, and mild carpus valgus**
- **Bilateral elbow joint incongruency**
    - **Osteopathy, RIGHT anconeal process - sclerosis, possible fissure; see comments**
- **Multifocal periosteal bone spurs, LEFT distal brachium and antebrachium** - enthesophytes at muscular attachments, desmopathy of the radioulnar ligaments, and remodeling of grooves for extensor tendons; all likely secondary to increased strain due to altered weight-bearing from the angular limb deformity
- **Mild degenerative joint disease, RIGHT elbow** - likely secondary to the incongruency
- **Mild degenerative joint disease, LEFT carpus** - likely secondary to the angular limb deformity

Additional Comments

The ulna is short bilaterally, and on the right side, the classic angular limb deformities associated with short ulna syndrome (elbow varus, radius procurvatum, and carpus valgus) with secondary elbow joint incongruency and osteopathy (potentially with a fissure) of the anconeal process (which is put under increased pressure when the ulna is short relative to the radius), as well as mild secondary degenerative joint disease of the elbow.

On the left side, the ulna is also short and there is a severe medial bowing of the radius, but the degree of elbow joint incongruency is actually less than on the right limb, the anconeal process appears normal, and there are presently no signs of secondary degenerative joint disease. Hence, it can be speculated that the severe medial bowing of the left radius could be due to chronic trauma which has partially released the left elbow. Additionally, the widening and flattening of the distal radius and ulna are also not typical of short ulna syndrome alone, further supporting the suspicion of an old traumatic event being a contributory factor to the angular limb deformity on the left side.

In addition to the 3D reconstructions shown above in the report, a 3D reconstruction video of the left antebrachium with 360-degree rotation has been added to the VET.CT platform, so that the limb deformity can be studied from all angles.