

#### **Appendix 4. Ultrasound scanning protocol.**

Lateral longitudinal scans on both the radio-dorsal and radio-palmar side of the first CMC joint will be used to assess inflammatory and structural ultrasonographic findings (i.e. synovitis, Power Doppler signal, osteophytes, articular cartilage damage, joint space narrowing, and bone erosion). Dichotomous grading scales will be used to score all features, in addition to semi-quantitative grading scales for synovitis, Power Doppler signal, and osteophytes. The OMERACT US group has shown the reliability of these scales [1, 2]. In addition, joint space narrowing will be assessed using a quantitative scale, measured in mm, as the distance from the edge of trapezium to the edge of first metacarpal.

In addition, we will examine the ability of high-resolution ultrasonography to delineate morphological characteristics of anterior oblique ligament and radio-dorsal ligaments, the main stabilizing ligaments of this joint.

Subluxation of the first CMC joint is not an uncommon finding in OA due to specific ligament instability, as the anterior oblique ligament plays an important role in preventing volar metacarpal subluxation. The role of dynamic ultrasonographic stress test in detecting the instability of first CMC joint will be assessed. To replicate a clinical test used to detect anterior oblique ligament insufficiency [3], the joint will be held in palmar abduction position, and maximal volarly directed stress will be applied to the base of the first metacarpal, as the methods described to test the stability of this ligament in normal healthy joints [4].

#### **REFERENCES**

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