Clinical History:

This is a case of persistent pain and paraesthesia in the right ulnar palm in a 42 year old male amateur golf player.

Imaging Findings:

A 42 year old dentist complained of pain and paraesthesia on the ulnar palmar aspect of his right dominant hand, which had started after a golf match 2 weeks ago. His orthopaedic surgeon referred him for an MRI of the wrist to rule out osteonecrosis or discus lesion. The sequence protocol included transverse T2*-weighted gradient echo images, T1-weighted pre- and postcontrast spinecho images (Fig 1), and coronal STIR (Fig 2).
Discussion:

Ulnar artery thrombosis (or aneurysm) due to repetitive or single trauma of the hypothenar eminence has been termed the "hypothenar hammer syndrome" (HHS), for it mostly occurs in craftspeople using the hand as a hammer [1]. Certain sports involving a racket or a club also have been accused of causing this syndrome [2]. Although rarely diagnosed, ulnar artery thrombosis is not an infrequent pathology of the hand arteries. Due to its vicinity to the hook of the hamate in the canal of Guyon, the ulnar artery is prone to direct injury, which may lead to inflammation of the vessel wall, thrombosis or even false aneurysms. Digital ischemia is not uncommon, but in most reports, pain is the only symptom. Paraesthesia may be present due to compression of the adjacent ulnar nerve. Since the occlusion is often diagnosed too late for endovascular recanalization [3], therapy is normally conservative and requires watchful observation. Primary surgical reconstruction is indicated in cases with aneurysms [4]. Colour-coded ultrasound is generally the first-line imaging modality, if a peripheral arterial thrombosis is suspected [5]. As an alternative to intra-arterial DSA, which is the gold standard, especially in cases with digital ischemia, MR and CT angiography have also shown capable of visualising the ulnar artery occlusion and the blood supply of the palmar arches [6,7]. Although cross-sectional MRI is the method of choice for inexplicable pain about the hand and wrist [8], the MR findings in ulnar artery thrombosis or HHS have never been accurately described. In the present case, T2* gradient echo sequences proved extremely valuable to detect the thrombotic material. These susceptibility-weighted sequences exploit the paramagnetic properties of desoxy- or methemoglobin in a blood clot leading to a loss of intravascular signal (Fig 1). Susceptibility-weighted imaging has already been used to detect arterial thromboses in other body regions [9]. Judging from the few reports available, perivascular inflammation also seems to be a constant feature of arterial thrombosis. This may be visualised by fat-saturated and contrast enhanced MR imaging (Fig 2). However, the signal characteristics of thrombosis are most probably time-dependent and have to be studied in more depth.

Differential Diagnosis List: Ulnar artery thrombosis in hypothenar hammer syndrome.

Final Diagnosis: Ulnar artery thrombosis in hypothenar hammer syndrome.

References:

Description: Transverse slices of a T2* GE (a,b) and a fat-saturated post-contrast T1 SE (c,d) sequence at the level of the ulnar styloid process (left) and the pisiform bone (right). The ulnar artery is still patent in the proximal sections (arrowheads). Further distally, it shows intra-luminal signal void surrounded by a halo of contrast enhancement (arrows).
Figure 2

Description: Coronal STIR image (a) and MPR of a post-contrast FATSAT T1 SE sequence (b) showing the extension of the ulnar artery thrombus and the perivascular inflammation from the level of the pisiform bone into Guyon’s canal (arrows). Origin: