Scaphotrapeziotrapezoidal (STT) osteoarthritis
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Section: Musculoskeletal system
Area of Interest: Musculoskeletal joint Musculoskeletal system
Procedure: Diagnostic procedure
Procedure: Comparative studies
Imaging Technique: Ultrasound
Imaging Technique: Ultrasound-Colour Doppler
Imaging Technique: MR
Imaging Technique: CT
Imaging Technique: Image manipulation / Reconstruction

Special Focus: Pathology Case Type: Clinical Cases
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Patient: 53 years, male

Clinical History:

A 53-year-old male military officer presented with complaints of chronic localised pain on the thumb basilar area of his dominant hand along with decreased grip strength. Medical history revealed a hand injury 2 years before in a motor vehicle accident that was treated with simple splinting. No fracture was reported.

Imaging Findings:

The mechanism of his initial hand trauma was described as a high energy force applied axially on his outstretched palm (the patient was injured with his steering wheel during the collision). Mild swelling and tenderness on palpation over the thenar eminence was noticed on physical examination. Plain radiographs showed sclerosis of the scaphoid-trapezium-trapezoid articulating surfaces with associated joint space narrowing (Fig. 1). An ultrasound examination was performed subsequently that demonstrated irregularity of the scaphotrapezoidal articulation along with findings of accompanying synovitis (Fig.2). An MRI examination verified the aforementioned findings and relying on the clinical and imaging features, the clinicians suggested an MDCT examination in order to better delineate the joint pathology and the associated osseous surfaces (Fig. 3-4). The patient’s clinical history, together with the imaging findings established the diagnosis of a scaphotrapeziotrapezoidal (STT) posttraumatic osteoarthritis (Fig. 5) and the patient was referred to a specialised hand surgery clinic for possible surgical treatment.

Discussion:

The clinical evaluation and treatment of chronic wrist pain can often be a challenging diagnostic dilemma because the aetiology is broad and includes both intracarpal and intercarpal pathology [1-2]. With recent improvements in diagnosis and imaging of carpal disorders, the radiologists are able to confirm a clinical suspicion of injury and thus tailoring the appropriate therapy [1-3]. Scaphotrapeziotrapezoidal (STT) joint osteoarthritis has been estimated to account for 13% of all wrist arthritis cases and can cause significant pain and limitation of function [4-6]. Common predisposing factors are trauma, an abnormal trapezio-trapezoidal inclination and laxity of the capitotrapezial...
ligament [4-6]. Although the underlying pathophysiologic mechanisms that may lead to posttraumatic osteoarthritis are not well understood and clarified, studies have shown that the degree and severity of articular cartilage damage and the joint surface incongruity both correlate with the development of osteoarthritis [7]. STT arthritis is usually manifested with pain, swelling and stiffness over the thumb base and physical examination might reveal local tenderness and a radial grind in chronic cases [4-6]. However the clinical signs and symptoms are not considered pathognomonic and differential diagnosis from other causes such as scaphoid disorders, trapezio-metacapal osteoarthritis, DeQuervain tenosynovitis, symptomatic ganglion cysts may be required [4-6]. Therefore the radiologic evaluation is of paramount importance in treatment planning. Plain radiographs may be normal early in the setting of STT arthritis, while in advanced stages show the characteristic osteoarthritic features. High resolution ultrasonography of the small joints may provide additional information by revealing the accompanying synovial reaction and inflammation [8]. MRI has become an important diagnostic tool for evaluation of chronic hand and wrist pain because it can identify both intracarpal and intercarpal abnormalities [1-3]. In our case MRI verified the radiographic and ultrasonographic findings and also showed bone marrow oedema in the articulating bones of the STT joint. Furthermore an osteochondral defect was identified in the capitate bone, which was attributed either due to STT osteoarthritis and altered local biomechanics or as a result of the remote trauma. MDCT with its superior spatial resolution together with the availability of multiplanar reformations can delineate the osteoarthritic changes equally or even better than plain MRI [9]. STT arthritis is initially treated conservatively with splinting, oral analgesics or local corticosteroid injections. In advanced cases surgical treatment consists primarily of fusion of the STT joint, but alternative operative techniques include trapeziectomy, excisional arthroplasty, and prosthetic replacements [4-6, 10].

Differential Diagnosis List: Scaphotrapeziotrapezoidal (STT) osteoarthritis, Trapezio-metacapal osteoarthritis, DeQuervain tenosynovitis, Scaphoid disorders, Symptomatic ganglion cysts

Final Diagnosis: Scaphotrapeziotrapezoidal (STT) osteoarthritis

References:


Description: The plain radiograph shows severe joint space narrowing in the STT joint and subchondral sclerosis of the articulating bones (area in dashed line). Origin: Dpt of Radiology-Dpt of Orthopaedics
Figure 2

Description: Scaphotrapezoidal joint: The longitudinal US image shows irregularity of the articulating bones (arrows) and accompanying synovial reaction (asterisks). **Origin:** Dpt of Radiology-Dpt of Orthopaedics

Description: Scaphotrapezoidal joint: The longitudinal Colour Doppler US image demonstrates increased vascularity in keeping with active synovitis (arrows). Blue arrow shows a blood vessel. **Origin:** Dpt of Radiology-Dpt of Orthopaedics
Description: The coronal STIR MR image shows midcarpal joint effusion (asterisks) and bone marrow oedema in the trapezoid bone (arrow). Origin: Dpt of Radiology-Dpt of Orthopaedics
**Description:** The coronal STIR MR image shows bone marrow oedema in the scaphoid pole-trapezium (white arrows). Note bone marrow oedema and osteochondral defect in the capitate bone (yellow arrow). **Origin:** Dpt of Radiology-Dpt of Orthopaedics
Description: The coronal gradient recalled MR image demonstrates severe joint osteoarthritic changes with near complete joint fusion (area in dashed line). Note the associated osteochondral defect in the capitate bone (yellow arrow). Origin: Dpt of Radiology-Dpt of Orthopaedics
Description: The axial MDCT image shows severe osteoarthritic changes in the affected joint (arrow). Note joint space narrowing, subchondral bone irregularity and sclerosis, subarticular cyst and osteophyte formation. Origin: Dpt of Radiology-Dpt of Orthopaedics

Description: The axial MDCT image of the affected and normal joints are demonstrated for comparison (long arrow). Origin: Dpt of Radiology-Dpt of Orthopaedics
Description: a) The coronal MPR images are demonstrated for comparison. b-c) The coronal MPR images show the osteoarthritic changes (in dashed line). Note the osteochondral defect in the capitate bone (yellow arrow in a,b). **Origin:** Dpt of Radiology-Dpt of Orthopaedics

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Description: VRT demonstration **Origin:** Dpt of Radiology-Dpt of Orthopaedics
Description: VRT demonstration Origin: Dpt of Radiology-Dpt of Orthopaedics
Figure 5

Description: STT osteoarthritis. a) Radiograph, b) Ultrasound, c) MRI, d) MPR MDCT, e) VRT MDCT. Correlative presentation of imaging findings. Origin: Dpt of Radiology-Dpt of Orthopaedics