Osteoid Osteoma of the Hamate Presenting As a Midcarpal Synovitis

Guillem Salva-Coll, MD, PhD^{1,2} Xavier Terrades-Cladera, MD^{1,3}

¹IBACMA- Institut Balear de Cirurgia de Mà, Palma de Mallorca, Spain

²Hospital Universitari Son Espases, Palma de Mallorca, Spain

³Hospital Son Llatzer, Palma de Mallorca, Spain

Address for correspondence Guillem Salva-Coll, MD, PhD, IBACMA, Institut Balear de Cirurgia de Mà, Policlínica Miramar, Camí de la Vileta, 30, 07011 Palma de Mallorca, Illes Balears, Spain (e-mail: gsalva@ibacma.com).

J Wrist Surg 2015;4:61–64.

Abstract

Background Osteoid osteoma is a benign bone lesion of unknown etiology uncommonly affecting the carpal bones. In the upper extremity, the clinical and imaging picture may be misleading, often mimicking other entities. We present a rare case of a patient with a subchondral osteoid osteoma mimicking a posttraumatic midcarpal synovitis.

Case Description A 21-year-old woman presented with persistent pain and swelling of the right wrist. Physical examination revealed swelling and pain on direct palpation over the dorsal aspect of the wrist. Radiographs were normal. Inconclusive computed tomography (CT) and magnetic resonance imaging (MRI) scans suggesting an occult fracture versus avascular necrosis delayed the diagnosis. Scintigraphy and fine-cut CT scan provided the definitive diagnosis. Surgical excision of the nidus and synovectomy of the midcarpal joint were performed, with complete resolution of pain and rapid return to normal function.

Literature Review Three different types of osteoid osteoma have been described according to radiological methods: cortical, medullar, and subperiosteal. When localized in the carpus, most lesions are intra-articular. Reactive synovitis is often present and may be the primary symptom. Radiofrequency ablation is a treatment alternative. However, if a safe distance between the electrode and a major neurovascular structures (up to 1.5 cm) cannot be guaranteed, surgical excision is recommended.

Clinical Relevance A high index of suspicion and careful attention to the clinical picture are necessary for accurate diagnosis and treatment of osteoid osteoma in the hand and carpus. CT scan and scintigraphy are the most sensitive complementary investigations and enable definitive diagnosis and treatment.

Keywords

- osteoid osteoma
- hamate
- carpal neoplasms

Osteoid osteoma is a benign bone lesion of unknown etiology, uncommonly affecting the carpal bones. Its incidence is ~11% of benign tumors and 3% of all primary bone tumors, with 6% to 13% of all cases occurring in the hand.¹

Osteoid osteoma has a predilection for the long bones, with 50–60% occurring in the femur and tibia, and in these cases the diagnosis is usually typical, with focal bone pain that usually worsens at night, increases with activity, and is relieved with nonsteroidal anti-inflammatory drugs (NSAIDs). However, in

other parts of the skeleton, such as the upper extremity, the clinical and imaging picture may be misleading, often mimicking other entities.²

In the carpus, the published papers reflect such a variety of clinical presentations mimicking other entities: flexor carpi radialis (FCR) tendinitis,³ synovitis of the wrist joint,⁴ painful swelling,⁵ and so on. We present a rare case of a patient with a subchondral osteoid osteoma mimicking a posttraumatic midcarpal synovitis.

Fig. 1 Preoperative clinical aspect of the right wrist, showing swelling of the dorsum of the wrist (white arrow).

Case Report

Three months after a minor sprain, a 21-year-old woman presented with persistent pain and swelling in the dorsal ulnar aspect of the right wrist (►Fig. 1). Pain worsened with activity and was partially alleviated with NSAIDs. Physical examination revealed swelling and pain on direct palpation over the dorsal ulnar midcarpal joint, and a very painful grade III midcarpal shift test.⁶ Radiographs were normal (►Fig. 2). A wrist sprain with midcarpal synovitis was diagnosed, and a volar splint for 4 weeks and NSAIDs for 10 days were recommended. The patient's pain was unresponsive to conservative treatment. A magnetic resonance imaging (MRI) scan was performed (►Fig. 3), which showed diffuse edema of the hamate bone and significant soft tissue edema in the midcarpal joint and dorsal aspect of the wrist, suggesting an occult fracture. A computed tomography (CT) scan showed an irregular dorsal cortex of the hamate, without evidence of fracture. An MRI scan was taken 3 months later due to the persistence of symptoms, showing a diffuse hamate edema with sclerosis and decreased soft tissue edema, suggesting an avascular bone necrosis (AVN). An osteoid osteoma was

Fig. 2 Posteroanterior X-ray images of both wrists, showing no abnormalities in the right hamate.

suspected, and a scintigraphy was performed (►Fig. 4), showing an intense uptake of the hamate, supporting the diagnosis of an osteoid osteoma rather than AVN. Seven months later, a fine-cut CT scan (►Fig. 5) demonstrated an osteoid osteoma in the dorsal cortex of the hamate bone adjacent to the articular surface of the midcarpal joint.

The patient was taken to the operating room. The midcarpal ulnar joint was exposed through a dorsal approach. An extensive intra-articular synovitis was observed over the nidus. The nidus was easily identified as a 3 × 3-mm round

Fig. 3 MRI scan. (a) T1 sagittal, (b) T1 coronal, and (c) T2 coronal, showing diffuse edema of the hamate bone and significant soft tissue edema in the midcarpal joint and dorsal aspect of the wrist, suggesting an occult fracture (white arrow).

Fig. 4 Scintigraphy of the wrists showing an intense uptake of the hamate, supporting the diagnosis of osteoid osteoma versus avascular necrosis.

Fig. 5 Fine-cut CT scan. (a) In the coronal image, showing a localized increased bone density, and (b) in the sagittal image showing the nidus in the dorsal aspect of the hamate (white arrow).

Fig. 6 Intraoperative image showing the nidus (white arrow) located in the dorsal cortex of the hamate, beside the articular cartilage of the midcarpal joint. H, hamate; Tqt, triquetrum.

Fig. 7 Intraoperative image after resection of the nidus with only a minimal curettage of the dorsal aspect of the hamate (white arrow). H, hamate; Tqt, triquetrum.

reddish mass 1 mm distal to the dorsal hamate cartilage (►Fig. 6). A synovectomy was performed; the bone mass was easily resected with a small osteotome, with only a minimal curettage of the dorsal aspect of the hamate bone, so no bone grafting was necessary (►Fig. 7). Histologic examination confirmed the diagnosis of an osteoid osteoma with a nonspecific synovitis. The wrist was splinted for 2 weeks following surgery. The patient's pain resolved in the first 48 hours after surgery. She regained normal wrist motion within 4 weeks. She remained free of symptoms 18 months after surgery.

Discussion

The osteoid osteoma usually represents a diagnostic challenge. Whereas in the femur and tibia the clinical presentation is usually typical—with focal bone pain that usually worsens at night, increases with activity, and is relieved with NSAIDs—in the upper extremity the clinical and imaging picture usually is misleading, often mimicking other entities and making the diagnosis more difficult.^{3–5} Three different types of osteoid osteoma have been described according to radiological methods: a cortical type (the “classic” type), a medullary type (with less sclerosis), and a subperiosteal type (with no sclerosis at all and only bone ulcerations due to compression and resorption).⁶ When localized in the carpus, most lesions are intra-articular. Reactive synovitis of the radiocarpal or midcarpal joint is often present and may be the primary symptom. Most commonly, the pain is well localized except in cases involving intra-articular localizations accompanied by synovitis, which present with a more diffuse pain area.

Our patient's clinical presentation revealed a lesion that was subchondral (medullary) in the dorsal aspect of the hamate, which also communicated with the midcarpal joint. The irregular dorsal cortex of the hamate seen on the first CT scan without evidence of fractures was consistent with an osteoid osteoma in retrospect, but the patient's history of antecedent trauma led to the initial MRI findings being interpreted as being post-traumatic in nature, thus delaying the final diagnosis.⁷

The largest reported series of surgically treated upper-extremity osteoid osteomas showed 87% overall success in 46 patients, but only 74% success in the 19 lesions of the hand and carpus (five recurrences, requiring 12 total procedures), compared with 96% in the remainder of the upper extremity. Recurrences were attributed to inadequate bone excision, and techniques were recommended for complete yet conservative excision in such small areas, including intraoperative radionuclide localization and preoperative CT-guided needle localization.⁸ Subperiosteal lesions are easily identified, but in cortical or medullar lesions, it could be helpful to mark the nidus with a needle intraoperatively with the aid of radiography.

In summary, a high index of suspicion and careful attention to the clinical picture is necessary for accurate diagnosis and treatment of the osteoid osteoma in the hand and carpus. CT scan and scintigraphy are the most sensitive complementary investigations in the evaluation of osteoid osteoma of the carpal bones and enable definitive diagnosis and treatment. Complete excision of the nidus is mandatory for complete resolution of the symptoms associated with osteoid osteoma.

Conflict of Interest

None

References

- 1 Rubin G, Wolovelsky A, Rinott M, Rozen N. Osteoid osteoma of the hamate: an unusual cause of ulnar-sided wrist pain. *Orthopedics* 2010;33(7):513–515
- 2 Themistocleous GS, Chloros GD, Benetos IS, Efstathopoulos DG, Gerostathopoulos NE, Soucacos PN. Osteoid osteoma of the upper extremity. A diagnostic challenge. *Chir Main* 2006;25(2):69–76
- 3 Park JW, Lee KH, Lee JL. Osteoid osteoma of the distal pole of the scaphoid mimicking flexor carpi radialis tendinitis. *J Hand Surg Eur Vol* 2014; [Epub ahead of print]
- 4 Bhardwaj P, Sharma C, Sabapathy SR. Synovitis of the wrist joint caused by an intraarticular perforation of an osteoid osteoma of the scaphoid. *Indian J Orthop* 2012;46(5):599–601

- 5 Chamberlain BC, Mosher JF, Levinsohn EM, Greenberg JA. Subperiosteal osteoid osteoma of the hamate: a case report. *J Hand Surg Am* 1992;17(3):462-465
- 6 Jackson WJ, Markiewicz AD. Osteoid osteoma of the hamate. *Orthopedics* 2008;31(5):496-498
- 7 De Smet L. Osteoid Osteoma of the wrist and hand. *J Hand Surg Am* 2001;1:267-274
- 8 Bednar MS, McCormack RR Jr, Glasser D, Weiland AJ. Osteoid osteoma of the upper extremity. *J Hand Surg Am* 1993;18(6):1019-1025