CASE REPORT

OSTEOBLASTOMA OF THE CARPAL SCAPHOID FREQUENCY AND TREATMENT

K. C. XARCHAS, D. LEVIET

A rare case of osteoblastoma of the carpal scaphoid is presented. Review of the literature revealed two more cases that have been previously reported. The authors present the diagnostic difficulties and the treatment which was applied : proximal row carpectomy and tendon transfers for wrist stabilization. Treatment options, according to the literature, also include scaphoidectomy and tumor curettage with bone grafting.

Keywords : osteoblastoma ; scaphoid ; proximal row carpectomy.
Mots-clés : ostéoblastome ; scaphoïde ; résection de la 1e rangée du carpe.

INTRODUCTION

Osteoblastoma is a rather uncommon tumor, especially when located in the wrist (and hand). Its diagnosis therefore appears to be problematic. We present one such case (the third ever reported in the literature) and the treatment applied : proximal row carpectomy, which was chosen because of the aggressive nature of the tumor. Tendon transfers were performed in the same session for wrist stabilization. Other authors have opted for a more conservative approach.

CASE REPORT

A 27-year-old woman was referred by her general practitioner for a second opinion and further treatment of her painful and swollen right (dominant) wrist. She was otherwise fit and healthy. Her problem had begun two years before, when she started having pain over the dorsoradial aspect of the wrist, with no clear history of trauma. After xrays, a provisional diagnosis of scaphoid fracture was followed by application of a scaphoid - type plaster cast for three weeks. As the diagnosis was not radiologically confirmed, treatment was discontinued. After removal of the plaster, the pain persisted and a few months later she underwent a radial styloidectomy with decompression of the first dorsal compartment of the wrist. A biopsy was interpreted as reflecting mechanical synovitis. The symptoms continued and swelling started developing on the dorsoradial side of the wrist. Xrays taken at that time showed a possible calcification near the scaphoid, and sonography showed soft tissue swelling around the radial wrist extensors. Investigations including a full blood count, erythrocyte sedimentation rate, rheumatoid factor, anti-DNA and antinuclear antibodies were negative.

A second operation was performed twelve months after the first one. It included excision of a soft tissue mass, extensor synovectomy and resection of the posterior interosseous nerve. The biopsy taken was reported as either a lipoma with a strong fibrotic and inflammatory element or a hypodermic nodular reactive formation without any specific histological character.

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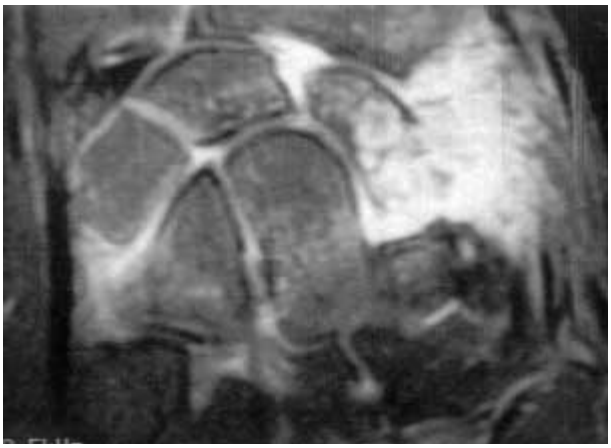

Fig. 1. — MRI scan, coronal view

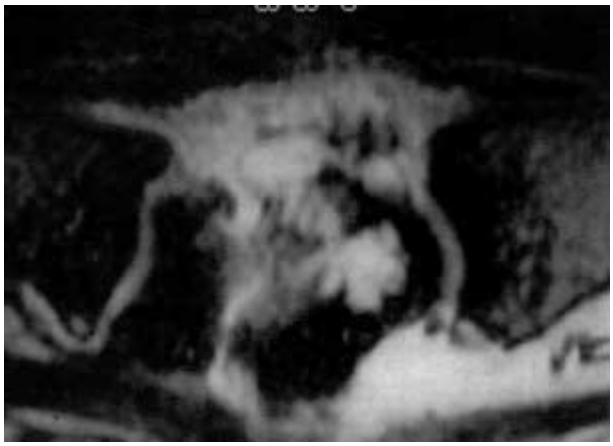

Fig. 2. — MRI scan, sagittal view

In spite of surgery and physiotherapy the patient's wrist steadily deteriorated. The swelling recurred, the wrist stiffened and the pain became worse. At that point she was referred to the senior author (D. L.).

On examination the wrist was extremely painful and stiff. There was practically no wrist movement, but a reasonable finger flexion-extension was present. A tumefaction was palpable over the radial wrist extensors and the anatomical snuffbox ; it measured about 3 × 2 cm ; it was nonmobile, nonfluctuating and extremely painful.

Xrays showed marked osteopenia of the wrist and hand with calcification around the scaphoid and an area of radiolucency inside it. Technetium bone scan showed increased uptake in the scaphoid area. An MRI scan revealed what appeared to be a highly vascularized soft tissue mass expanding from the radial to the ulnar border of the wrist and also involving the scaphoid. According to the radiologists the picture was consistent with a possible synovial lesion such as pigmented villonodular synovitis (figs. 1, 2). Further surgical treatment was performed soon after completion of the investigations.

Operation : An extended dorsal wrist incision immediately revealed a yellowish synovial mass that was engulfing the tendons of the first, second and third dorsal wrist compartments and invading the dorsal capsule of the radiocarpal and midcarpal joints. Synovectomy of the extensors and excision of the posterior capsule with the mass was performed and allowed for complete exposure of the carpus. The scaphoid had a grayish appearance with a tumorous projection posteriorly that was already ulcerated. *En bloc* excision of the scaphoid (fig. 3) allowed for better exposure of the soft tissue mass that was found to be invading the area of the previous styloidectomy and even the anterior capsule and the dorsal surface of the flexor carpi radialis. In view of the aggressiveness of the lesion, complete excision of the proximal carpal row was performed (including the pisiform), followed by a thorough synovectomy and removal of the yellowish soft tissue mass infiltrations. Frozen sections of the synovium failed to indicate whether the mass was benign or not. As the capsulectomy-carpectomy had rendered the wrist completely unstable, a tendon transfer using the extensor carpi radialis brevis was performed to provide stability. A band half the thickness of the tendon and of adequate length was separated proximally and left attached distally. It was then passed through a hole in the distal radius to be attached at the base of the capitate. This allowed for posterior stabilization of the wrist with palmar flexion up to 30°. Because of the radial styloidectomy there was also a tendency to radial subluxation of the wrist. This was improved with a transfer of the extensor carpi radialis longus to the base of the third metacarpal. The wrist was finally immobilized in a short arm plaster cast for six weeks.

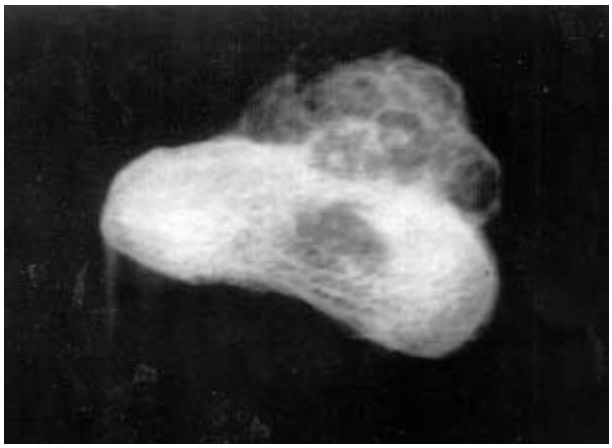

Fig. 3. — Xray of the excised scaphoid

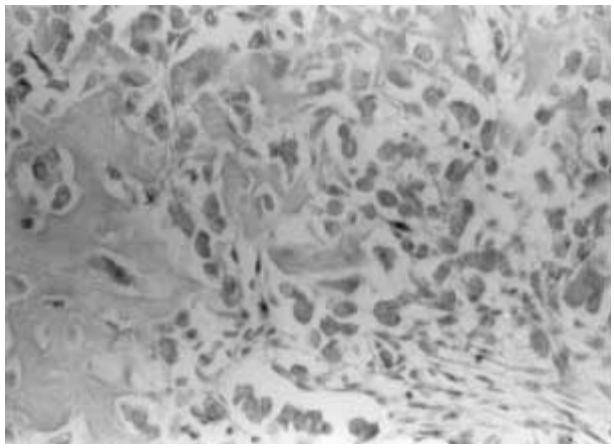

Fig. 4. — Histologic appearance of the tumor

Histologic examination of the scaphoid showed a lesion consisting mainly of a benign osteoblastic proliferation. A large osteoblastic nidus was seen, formed by irregular trabeculae of osteoid that were encircled by numerous osteoblasts with dystrophic nuclei. A large number of osteoclasts was also present. There was no sclerotic reaction of the matrix as is usually observed in osteoid osteoma, and the tumor was accompanied by numerous telangiectasic vascular lacunae. There was no area suspicious for malignancy, especially osteosarcoma. The diagnosis was osteoblastoma (fig. 4). Examination of the synovium showed a pseudotumorous reaction, with chronic inflammation and no specific histologic character.

One week **postoperatively** the patient was practically pain-free. After removal of the plaster a rehabilitation program was started and three months postoperatively her progress was already very satisfactory. The wrist was completely pain-free and stable. The range of movement was dorsiflexion 20°, palmar flexion 15°, ulnar deviation 15°, radial deviation 10°, with full supination and pronation. Postoperative xrays were also satisfactory (fig. 5). The treatment continued with further physiotherapy and intermittent splinting. Due to the aggressiveness of the lesion and the possibilities of recurrence the patient was advised on the need of a long-term follow-up.

DISCUSSION

Osteoblastoma is an uncommon bone tumor. It usually occurs in the pelvis, spine and long bones and very rarely presents in the hand (1, 3). Although it resembles osteoid osteoma there are significant differences between the two lesions in their clinical, radiological and histological appearance (3, 4). Pain is more prominent in osteoid osteoma as is the characteristic radiolucent nidus (1, 4). Osteoblastoma is more commonly centered in the medullary portion of the bones, whereas osteoid osteoma tends to be located in the shaft, juxta- or intracortically (3, 4, 11). Osteoblastoma is usually larger than 2 cm in diameter and histologically presents less surrounding reactive bone (1, 4, 6). Osteoblastoma as a separate entity was first described by Jaffee in 1932 (5). This was a case of osteoblastoma of a metacarpal that was treated with *en bloc* excision and fibular grafting. In 1978 Mosher *et al*. described a case of osteoblastoma of the fifth metacarpal in a 10-year-old boy (9). This was also treated with excision of the tumor and a fibular graft.

In 1993 Fanning and Lucas (1) reported a case of osteoblastoma of the scaphoid in a 31-year-old woman. She had a long-standing history of wrist pain, very similar to that of our patient. While exploring the lesion, the authors also found an

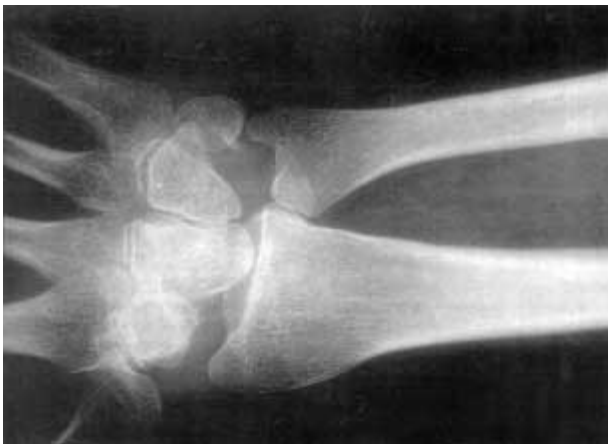

Fig. 5. — Postoperative xray of the wrist

inflamed synovial mass. They performed curettage of the tumor and cancellous bone grafting of the scaphoid. Three years later there was no recurrence, but the patient still had pain and stiffness.

A second case of scaphoid bone osteoblastoma was reported by Ragois *et al*. in 2000 (10). The authors stress the rarity of the tumor, the difficulties in diagnosis and the local aggressiveness of the tumor that led them to perform scaphoidectomy. In our case the tumor of the scaphoid appeared to be even more aggressive and although localized, still very destructive. This aggressive nature of osteoblastoma has already been described, as well as the possibilities of local recurrence or malignant transformation into osteosarcoma (4, 6, 8, 11, 12). Schajowicz and Lemos (1976) have even suggested the use of the term malignant osteoblastoma to describe what they consider to be a rare group of tumors with a peculiar histological pattern and only local aggressiveness, somewhere between osteoblastoma and osteosarcoma (11).

Marshall *et al*. (1987) reported a case of osteoblastoma of the triquetrum that was undiagnosed for over two years in spite of the patient's persistently painful wrist (7).

Differential diagnosis of scaphoid bone tumors should also include intraosseous ganglion cysts. These lesions have been found in all carpal bones. Fealy and Lineaweaver (1995) report one such lesion of the scaphoid, treated with curettage and bone grafting (2).

We believe that wide resection (with long-term follow-up) should be the treatment of choice in cases of aggressive osteoblastoma. In our case the extensive invasion of the soft tissues justified complete resection of the dorsal capsule and ligaments. This in turn created the need for wrist stabilization with a double tendon transfer. Transfer of the radial wrist extensors gave a reasonably stable and balanced wrist, and we therefore recommend the technique in similar cases.

With three reported cases, we believe that osteoblastoma of the scaphoid should be recognized as an uncommon but still possible cause of wrist pain. Its differential diagnosis mainly includes osteoid osteoma and intraosseous ganglion cysts. When diagnosed, osteoblastoma of the scaphoid should be treated with extreme care due to its potentially aggressive nature.

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SAMENVATTING

K. C. XARCHAS, D. LEVIET. Voorkomen en behandeling van osteoblastoma van het scaphoid.

De auteurs beschrijven de diagnostische moeilijkheden van een zeldzaam osteoblastoma van het scaphoid, en de behandeling met proximale rij resectie en stabiliserende peestransplantaties. In de literatuur werden twee dergelijke gevallen gevonden, behandeld met scaphoidectomie of tumor resectie en opvulling met botenten.

RÉSUMÉ

K. C. XARCHAS, D. LEVIET. Osteoblastome du scaphoïde carpien. Fréquence et traitement.

Les auteurs rapportent un cas rare d'ostéoblastome du scaphoïde carpien. Ils n'ont trouvé que deux autres cas similaires dans la littérature. Ils présentent les difficultes diagnostiques et le traitement réalisé : résection de la première rangée des os du carpe, avec deux transferts tendineux pour stabiliser le poignet. D'autres options sont la résection du scaphoïde ou le curetage de l'os avec apport de greffons osseux.