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Intraosseous Synovial Cyst of Carpal Scaphoid: Case Report and Review of Literature

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Authors' contributions

This work was carried out in collaboration among all authors. Author MOC designed the case study and wrote the first draft of the manuscript. Authors AG and HH managed the literature searches. Author RM managed the analyses of the study. Author MAS corrected the final manuscript. All authors read and approved the final manuscript.

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Case Study

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ABSTRACT

Cystic lesions of the carpal bones represent a rare etiology of wrist and hand pain. The localization in the scaphoid is exceptional. Its pathophysiology is not well understood and its clinical presentation is not unequivocal as it can cause pain and swelling of the wrist or be totally asymptomatic and revealed by a pathological fracture or fortuitously.

X-Ray exploration allows making the diagnosis and CT-Scan allows better characterization of the cyst with detection of cortical involvement or joint communication. Treatment is conservative at an early stage and becomes surgical in case of cortical erosion or increase in size of the cyst with persistent pain.

We report the case of a 41-years-oldwoman who presents an intraosseous cyst of the scaphoid discovered fortuitously to study the clinical, radiological and therapeutic aspects of this entity.

Keywords: Bone cyst; scaphoid cyst; intraosseous ganglion; hand surgery.

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1. INTRODUCTION

Cystic lesions of the carpal bones are infrequent entities that are rarely described in the literature [1,2]. The scaphoid represents a rare localization of intraosseous carpal bone cysts which incidence and management are neither frequently reported nor well understood [2].

This work aims to summarize the available evidence on the evaluation and treatment of scaphoid cystic lesions to help guide clinical and therapeutic management.

2. CASE REPORT

We report the case of Mrs. SD, 41 years old, right-handed, housewife, with no history, who presented to the emergency room with a closed trauma of the wrist: fall from her own height with reception on the palm of the left hand (non-dominant member).

On examination, we found a painful swollen wrist with partial functional impotence, no pain on palpation of the radial styloid or the scaphoid tubercle, PINCH test was negative.

Frontal X-ray of the wrist was performed without showing a fracture line but a well-rounded homogeneous image with homogeneous sclerosis (Fig. 1).

We completed the exploration with a CT-scan which revealed an osteolytic lesion of the left scaphoid, with sharp edges, surrounded by a border of condensation, communicating with the lunar scaphoid joint, of homogeneous matrix, without anomalies of the adjacent soft parts (Fig. 2).

Faced with this ruptureintraosseous cyst, we opted for surgical treatment.

By a dorsal approach of the scaphoid using a dorso-radial incision, we proceeded to trepanation of the bone which let a yellowish gelatinous liquid flow. After curettage of the residual cavity, an autologous graft was performed from the cancellous bone of the distal radial epiphysis. Post-operative immobilization of the wrist was maintained for 4 weeks.

The bacteriological examination was negative. Histological examination of the curettage product

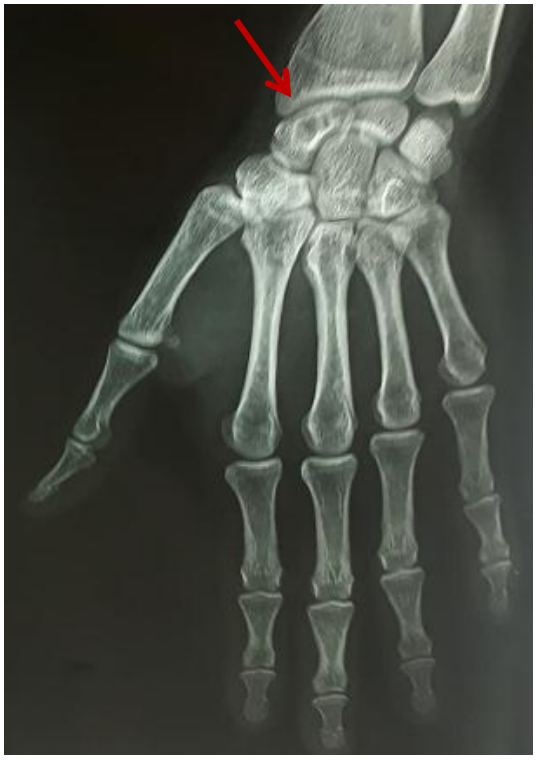


Fig. 1. Pre-operativefrontal X-ray of the left wrist and hand

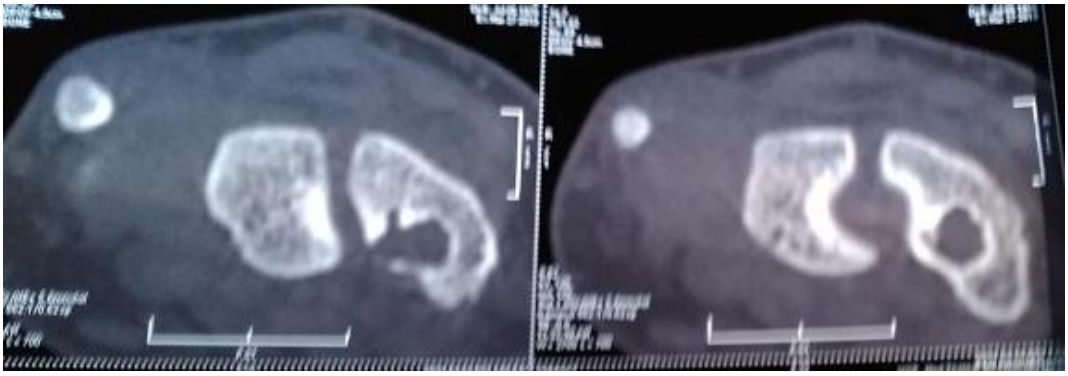
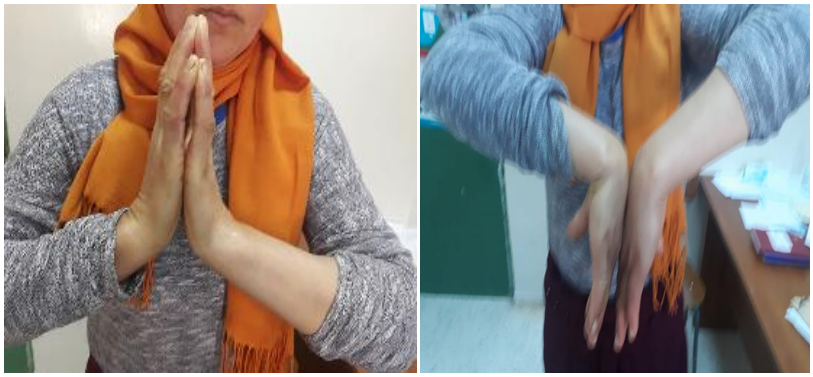


Fig. 2. Axial CT-scan planes passing by the scaphoid



a **b**

Fig. 3. (a) Complete dorsal flexion of the wrist, (b) Complete palmar flexion of the wrist

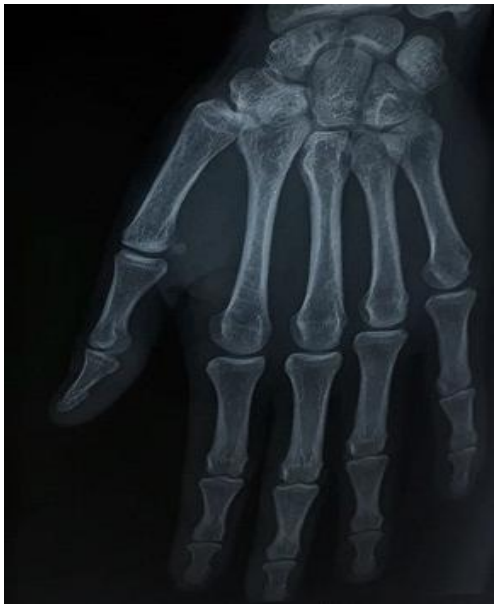


Fig. 4. Post-operative frontal X-ray of the left wrist and hand

showed a calcified fibro-hyaline tissue made of regular, non-atypical fibroblastic cells. The operating follow ups were without particular incidents.

Rehabilitation was started at the fourth week post-operative, after removal of the plaster, and continued for 03 months to decrease edema and avoid stiffness. It consisted of passive and active range of motion exercises of the wrist and fingers, divided into three sessions per week. Additional exercises of muscular strengthening and occupational therapy allowed regaining a complete hand function.

At the last follow-up, one year post-operative, the patient presented with a painless wrist and complete mobility (Fig. 3a,3b). The X-ray exploration showed bone consolidation with no sign of recurrence (Fig. 4). It should be noted that bone consolidation was obtained since the 6^{th} month post-operative with complete disappearance of wrist pain.

3. DISCUSSION

The intraosseous synovial cyst (IOSC) is much less frequent in the carpus than in the long bones (in the epiphyso-metaphyseal zone) [1,3]. Its location in the scaphoid is exceptional [4].

The peak incidence of IOSC is between 25 and 45 years old with a female predominance [1].

The pathophysiology is still controversial. The literature specifies two main hypotheses.Some authors believe that these cysts are secondary to intramedullary synovial metaplasia or bone necrosis following microtrauma or ischemic phenomena. Others defend the theory based on the concept that the bone cyst is formed by synovial inclusion from the outside inside, that is to say by cortical diffusion of a synovial cyst of the soft tissues [1,5].

The clinical presentation of scaphoid IOSCs is not unequivocal as shown by Uriburu and Levy in their serie of 6 cases [6]; it can be asymptomatic, discovered acidentally by an x-ray of the wrist as is the case of our patient, as it can be manifested by mild pain in the wrist partially improved by analgesics secondary to the development of intraosseous hyperpressure by the development of a pathological process in a small cavity. Pain can regress and be replaced by swelling and an impasto of the wrist following the rupture of the IOSC and the diffusion of its content[1]. Otherwise, it can be revealed by a pathological fracture as described by Castellanos [7].

The wrist X-ray is sufficient for monitoring cyst progression and shows a well-defined, non-expandable, unilocular osteolytic lesion with surrounding sclera [2]. Computed tomography makes it possible to locate the lesion well, to confirm its liquid nature and to detect cortical involvement or joint communication which is pathognomonic [8]. Magnetic resonance imaging helps to detect the extent of the lesion and to assess the communication of the cyst with the adjacent joint.

In front of wrist pain with an osteolytic image of the scaphoid, other etiologies arise such as Preiser's disease, osteoid osteoma and intra bone chondroma. The positive diagnosis is often made by histological examination [9].

The treatment of IOSC is either conservative when no cortical erosion or change in size of the cyst is found during follow-up and consists in observation and reassessment [7], or surgical by curettage of the cyst, washing of the cavity then filling of the void with an autologous spongy bone graft taken from the iliac crest or the distal radial epiphysis, which avoids pathological fracture and healing without major risk of recurrence [6,10]. Surgery should be performed if the periodic radiograph shows a significant increase of the cyst’s size or cortical erosion, as in the case of our observation, or if the patient suffers from persistent pain [10,11].

In case of pathological bone fracture, several authors recommend surgical treatment. Abouchane et al. used an open dorsal approach with curettage of the cyst and cancellous bone graft taken from the distal end of the radius, followed by osteosynthesis by means of the screwing of Herbert [1]. Sbai et al. have opted for an anterior surgical approach of the scaphoid. Through the defect on the volar aspect of the scaphoid, the cystic lesion was curetted and the residual cavity was packed with a Zaidemberg's vascularized radial graft [3].

However, some other authors like Castellanos et al. have advocated a treatment of the pathological fracture of the scaphoid with a below-elbow cast for 8 weeks which led to healing of the fracture, and gradual to complete disappearance of the ganglion 12 months after injury [7].

Apart from the traditional surgical approach, previously described, other methods are increasingly used such as the intra-cystic injection of methyl-prednisolone acetate, or the debridement of the cyst andbone graft under arthroscopy [2].

4. CONCLUSION

IOSC is a rare benign bone tumor. The vague clinical symptomatology delays the diagnosis. The surgical treatment is immediately necessary if the cyst is complicated with cortical erosion or after an attempt with conservative treatment if the pain becomes resistant. Early diagnosis and treatment help prevent pathological bone fractures.

CONSENT

As per international standard or university standard, patient's written consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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