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Intraosseous Synovial Cysts of the Scaphoid Bone: A Rare Case of Fracture and Surgical Management

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Abstract

Intraosseous synovial cysts (ISCs) are rare occurrences characterized by synovial proliferation within the bone. This article presents a case report of a 19-year-old patient with a carpal scaphoid bone fracture and an incidentally detected intraosseous cyst. The patient underwent surgical treatment involving careful curettage of the cystic cavity, addition of a spongy bone graft, and fracture stabilization. The histopathological examination confirmed the presence of an intraosseous synovial cyst. The patient achieved a satisfactory functional outcome, with early consolidation and resumption of daily activities. The study emphasizes the importance of accurate diagnosis and appropriate surgical management, highlighting the favorable prognosis and rarity of recurrences in intraosseous synovial cysts of the scaphoid bone.

Index terms— intraosseous synovial cysts, scaphoid bone, fracture surgical management, histopathological examination, radiography and computed tomography.

1 Introduction

Intraosseous synovial cysts (ISCs) are characterized by the presence of a specific radiological image and histology indicating synovial proliferation within the bone (1). Intraosseous synovial cysts of the scaphoid bone are an extremely rare cause of wrist and hand pain. The localization of this cyst specifically in the scaphoid bone is sparsely documented in the literature. This article presents a case report of a 19-year-old patient who experienced a carpal scaphoid bone fracture following a sports-related accident. Additionally, during the evaluation, an intraosseous cyst was incidentally detected.

2 II.

3 Case Report

It is about a 19-year-old patient with no notable medical history. He came to the emergency department of CHU Avicenne after sustaining an injury to his left upper limb during a sports accident, with his hand landing in hyperextension. During the interview, he mentioned having experienced previous injuries and suffering from chronic wrist pain for the past 3 months, which is relieved by symptomatic treatment with painkillers and non-steroidal anti-inflammatory drugs. Upon clinical examination, the patient exhibited slight limitation of wrist function, accompanied by swelling and filling of the anatomical snuffbox. Palpation elicited pain during thumb retroversion and wrist pronation, as well as tenderness upon pressure in the anatomical snuffbox.

The standard radiographic assessment revealed a scaphoid fracture with an underlying gap, suggesting the possibility of a cyst or pseudarthrosis of the scaphoid (figure 1). The wrist CT scan confirmed the scaphoid fracture with a probable intraosseous cyst (figure 2). The patient underwent surgery via an anterior approach. Careful curettage of the cavity was performed after distraction of the fracture site. The bone defect was filled with autologous cancellous graft harvested from the lower metaphysis of the ipsilateral radius. Fracture stabilization was achieved with 2 pins (figure 3). The histopathological examination of the curettage specimen showed that the cyst wall was lined with flattened fibroblastic cells resembling synovial cells, without true epithelial appearance. There was no mucoid degeneration or myxoid transformation. The patient was immobilized for 2 months in a

7 CONCLUSION

43 resin splint. After this period, the hardware was removed under local anesthesia. Several sessions of functional
44 rehabilitation were initiated after plaster removal. At the latest follow-up at 6 months after treatment, the patient
45 had regained good wrist function, with painlessness and resumption of leisure and professional activities.

46 4 I

47 5 III.

48 6 Discussion

49 Cysts of the carpal scaphoid are uncommon in daily practice. Most often, they are either mucoid cysts or synovial
50 cysts. These cysts typically develop at an advanced age, with an average age of 41 and 47 years in the two largest
51 series [2].

52 The pathophysiology of bone cysts remains controversial, with two main opposing hypotheses. Some authors
53 argue that the bone cyst forms through synovial inclusion from the outside to the inside. Others suggest synovial
54 metaplasia originating within the bone itself, potentially influenced by local microtrauma or ischemic phenomena
55 [3,4].

56 Intraosseous synovial cysts can present in two distinct ways: they may not exhibit any symptoms or they can
57 result in moderate pain that typically does not respond well to painkillers. Other clinical manifestations may
58 arise due to complications associated with intraosseous synovial cysts [1,5,6], such as wrist swelling caused by the
59 rupture of the cysts and the spread of its contents within the joint. Moreover, a pathological fracture can occur,
60 exacerbating the pain [1,5].

61 From a radiological perspective, typical images show osteolytic lesions of a few millimeters in diameter, either
62 solitary or multilobulated, accompanied by a peripheral rim of osteosclerosis [7]. This description corresponds
63 to the lesion observed on our patient's radiographs, along with a discontinuity at the scaphoid neck, indicating
64 a pathological fracture due to weakening of the scaphoid neck. Computed tomography, whether performed with
65 or without contrast agent injection, allows for precise determination of the nature of the intracystic contents
66 and any cortical involvement [1,7]. It also helps establish a surgical protocol by specifying the most appropriate
67 approach, including the preferred surgical access route.

68 The only patients requiring surgical intervention are those who experience persistent pain or swelling of soft
69 tissues, as well as those with a pathological fracture, as in our case. Additionally, preventive intervention may
70 be considered for lesions at risk of fracture due to their location (scaphoid neck) and volume (large geode
71 with significant cortical thinning) [8]. The surgical procedure involves a thorough excision by curetting the
72 contents of the cystic cavity as completely as possible. A spongy bone graft is systematically added, along
73 with osteosynthesis if necessary, as recommended by most authors [9,10]. The functional prognosis is generally
74 favorable, and recurrences are exceptional (5). In our case, we observed an early consolidation (55 days) compared
75 to the usual timeframe of 3 months, with a highly satisfactory functional outcome.

76 IV.

77 7 Conclusion

78 The functional prognosis of intraosseous synovial cysts of the scaphoid bone is generally favorable, with
79 exceptional recurrences. In our case, we observed an early consolidation occurring in just 55 days compared to
80 the usual timeframe of 3 months, with a highly satisfactory functional outcome. This case report highlights the
81 importance of accurate diagnosis and appropriate surgical management for patients with intraosseous synovial
82 cysts of the scaphoid bone. Careful curettage of the cystic cavity and the systematic addition of a spongy
83 bone graft, along with possible osteosynthesis, were recommended to ensure complete excision and optimal
84 consolidation. Standard radiography and computed tomography were valuable tools in confirming the diagnosis
85 and guiding the surgical treatment. Through appropriate management, the patient was able to regain satisfactory
86 wrist function and resume daily activities. However, long-term monitoring is necessary to detect any potential
87 recurrences. This study also emphasizes the importance of ongoing research and documentation of intraosseous
88 synovial cysts of the scaphoid bone to improve understanding of their pathophysiology and treatment options.



1

Figure 1: Figure 1 :



2

Figure 2: Figure 2 :



3

Figure 3: Figure 3 :

appropriate surgical management, highlighting the favorable prognosis and rarity of recurrences in intraosseous synovial cysts of the scaphoid bone. Radiography and computed tomography are valuable tools in confirming the diagnosis and guiding treatment. Long-term monitoring is essential to detect any potential recurrences, and further research is needed to improve understanding of the pathophysiology and treatment options for these cysts.

Figure 4:

89 .1 Funding

90 This research received no specific grant from any funding agency in the public, commercial, or not-forprofit
91 sectors.

92 .2 Ethics approval and consent to participate

93 Ethical approval was not sought. Written consent was obtained from the patients.

94 .3 Availability of data and materials

95 The datasets used and analysed during the study are available from the corresponding author.

96 .4 Declaration of conflicting interest

97 The authors declare that there is no conflict of interest.

98 .5 Authors contributions

99 All authors Have read and approved the final manuscript.

100 [Logan et al. ()] ‘Bilateral scaphoid ganglion cysts in an adolescent’. S E Logan , L A Gilula , M Kyriakos . *J*
101 *Hand Surg Am* 1992. 17 p. .

102 [Logan et al. (1992)] ‘Bilateral scaphoid ganglion cysts in an adolescent’. S E Logan , L A Gilula , M Kyriakos .
103 *J Hand Surg Am* 1992 May. 17 (3) p. .

104 [Chantelot et al. ()] ‘Fracture du scaphoïde carpien sur kyste intraosseux’. C Chantelot , P Laffargue , M
105 Mamejean , B Peltier , P Barouk , C Fontaine . *Ann Chir Main* 1998. 17 p. .

106 [Mamejean et al. ()] ‘Géodesites primitives du carpe’. E Mamejean , C Chantelot , J Y Alnot , G Hayem .
107 *Rev ChirOrthop* 2000. 86 p. .

108 [Forstner ()] ‘Intra-osseous ganglion in the area of the wrist’. H Forstner . *Chirurgie* 1992. 63 p. .

109 [Waizenegger ()] ‘Intraosseous ganglia of carpal bones’. M Waizenegger . *J Hand Surg [Br]* 1993. 18 p. .

110 [Uriburu and Levy ()] ‘Intraosseous ganglia of the scaphoid and lunate bones: report of 15 cases in 13 patients’.
111 Ijf Uriburu , V D Levy . *J Hand Surg Am* 1999. 24 p. .

112 [Mestdagh et al. ()] ‘Les kystes synoviaux intraosseux du carpe. À propos de trois cas’. H Mestdagh , Y Butruille
113 , C Maynou , J M Delobelle , M Lecomte-Houcke . *Ann Chir Main Membr Super* 1993. 12 p. .

114 [Yakoubi et al. (2009)] ‘Pathological fracture of the carpal scaphoid (intra-osseous synovial cyst) Clinical and
115 therapeutic aspect: case report’. M Yakoubi , N Meziani , Yahia Cherif , M Zemmouri , A Benbakouche , R
116 . *Chir Main* 2009 Feb. 28 (1) p. .

117 [Mamejean et al. (2000)] ‘Primary carpal bone defect’. E Mamejean , C Chantelot , J Alnot , G Hayem . *Rev*
118 *ChirOrthopReparatriceAppar Mot* 2000 Feb. 86 (1) p. .