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## **RESEARCH ARTICLE**

# Case Report: A pathological fracture in Simple Bone Cyst of Scaphoid

Dr Rishit J Soni, Dr Shreyas P Gandhi

Manuscript Info	Abstract
Manuscript History:	Simple or unicameral bone cyst are benign fluid filled lesions commonly found in proximal humerus and femur at metaphyseal region. Their occurrence in carpal bones, particularly scaphoid is very rare. We report here a case of an adult male with simple bone cyst of scaphoid with pathological fracture, treated with cast immobilization and achieved good functional outcome.
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*Corresponding Author	
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INTRODUCTION	

Simple bone cyst is one of the most common benign cystic lesions of bone. It is predominantly found at metaphyseal region but with growing age it tends to have a more diaphyseal occurrence. It is most commonly found in skeletally immature individuals, with male preponderance, mostly located at proximal humerus, femur and calcanuem<sup>1</sup>. On rare occasion it may be found in carpal bones, particularly in lunate, hamate and scaphoid <sup>2</sup>. In most of the cases they are clinically asymptomatic, but may present with mild pain or pathological fracture after trivial trauma.

### Case

A male patient, aged 35 years, labourer, presented to Orthopaedics Opd with chief complain of left wrist pain since last 3 days. The pain was moderate in intensity, localized, nonradiating and relieved by analgesic, without any preceding history of trauma. On examination, tenderness was localized at radial aspect of wrist without any swelling, with normal overlying skin condition. Patient had restricted range of left wrist movement and decreased grip strength as compared to right side, without any distal neurovascular deficit. Xray of left wrist (1) showed a well defined lytic lesion in scaphoid. For further evaluation CT Scan (2) showed a well defined lytic lesion in scaphoid with fracture leading to diagnosis of simple bone cyst with a pathological fracture. Aspiration under aseptic precaution under IITV guidance revealed straw coloured fluid and its histological examination confirmed the diagnosis. As patient did not consent for any surgical intervention, a scaphoid cast was applied for duration of 8 weeks. Following removal of cast, gradual physiotherapy was advised with protected weight lifting activities. The patient has at present no pain at left wrist with full grip strength with full resumption of his daily wage activities.



Fig. 1 : Xray Image

# C)

Fig 2: CT Scan Image

## **Review of Literature:**

Simple or unicameral bone cysts are benign fluid containing skeletal lesions. Various theories including failure to resorb haematomas, low-grade form of osteomyelitis, a defect in remodeling, a true intraosseous synovial cyst, the degenerative phase of a benign tumour, and venous obstruction<sup>3,4</sup>. Cohen stated that venous obstruction elevates intraosseous pressure leading to cyst formation. He showed that the fluid contents of simple bone cysts were similar to those of a transudate, and suggested that blockage of vessels in the area led to cyst formation<sup>5</sup>. Neer et al. stated that blockage of sinusoidal vessels in the area led to accumulation of interstitial fluid and cyst formation<sup>6</sup>. Komiya S et al suggested presence of oxygen free radicals in cystic fluid by measuring the levels of oxygen scavengers.<sup>7</sup>

Investigations have shown that the cyst fluid contains prostaglandins, oxygen free radicals, interleukins, cytokines, and metalloproteinases, all of which may contribute to bone resorption. The content of cyst is usually clear yellow, serous fluid, with occasional blood if a pathological fracture has occured. The lining of a unicameral bone cyst is composed of fibroblasts, rather than endothelial cells. Deep to this membrane lining, the cyst wall consists of fibrovascular tissue with fragments of immature bone, osteoclast-like giant cells, mesenchymal cells, and occasional lymphocytes<sup>1</sup>

Diagnosis is mostly established by plain radiograph which typically show a centrally located well defined lytic lesion with intact surrounding cortex, except in case of fracture. The 'fallen fragment' sign is pathognomonic for unicameral bone cyst with fracture. The differential diagnosis of a radiolucent lesion of the carpal bone most commonly includes an intraosseous ganglion cyst, Kienböck's disease, osteoid osteoma, giant cell tumor, enchondroma , aneurysmal bone cyst , nonossifying fibroma and fibrous dysplasia.<sup>1</sup>

As is the case with etiology, so is with the treatment of unicameral bone cyst which is diversified. Taking into consideration its spontaneous healing at adulthood, small cystic lesion particularly of upper extremity may be treated with observation with serial plain radiographs. In some cases of pathological fracture observation can be advocated keeping in mind the natural healing of fracture<sup>8</sup>, and if failure results intervention should be carried out to prevent refracture and promote healing of cyst.

Large lesion, symptomatic lesion and those associated with recurrence after conservative treatment can be managed with curettage and autologous bone grafting, particularly those of calcaneum. However, in case of large lesion, where procuring large amount of autologous grafts can result in detrimental effect on donor site, allografts, demineralised bone matrix and calcium phosphate cement can used as adjunct with autologous grafts<sup>1</sup>.

Simple bone cyst in proximal humerus and femur can be treated with curettage with autologous bone grafting with internal fixation, particularly using of flexible intramedullary nails.

Considering the high recurrence rates after curettage technique, Scaglietti et al<sup>9</sup> suggested use of intralesional injection of steroids. This technique is believed to work either by an antiprostaglandin effect or by decreasing the pressure of the cyst. Aspiration using 18 gauge needle followed by injection of methyl prednisolone acetate can be done under IITV guidance.

Recently, as an alternative to steroid, aspiration followed by intralesional injection of autologous bone marrow aspirate mixed with allograft demineralized bone matrix, high-porosity hydroxyapatite, calcium sulfate, and cancellous allograft<sup>1</sup>. After three injections without healing, curettage and bone grafting should be considered.

Percutaneous drilling with K wire and leaving in situ 2-3 K wires as treatment modality had been suggested by Kuboyama et al<sup>10</sup> is a relatively simple and inexpensive method of management, with possible explanation like a foreign body reaction to K wire and trephination which allows fluid to escape.

We have documented in this article a case of pathological fracture in scaphoid's simple bone cyst which is a very rare presentation and have put in efforts to summarize the diversified etiologic theories and treatment options avalable for simple bone cyst in hope of enlightening further research in this topic.

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