

Simple Bone Cyst of Metacarpal: Rare Lesion with Unique Treatment

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What to Learn from this Article?

Rare Presentation of UBC with Management.

Abstract

Introduction: Simple bone cyst or unicameral bone cyst (UBC) are benign cystic lesions commonly found in femur and humerus. However hand is a very rare site of occurrence. Treatment described for UBC of hand commonly involves curettage and bone grafting.

Case Report: A 7 year old right hand dominant girl presented to us with chief complaints of pain and swelling in right 4th metacarpal since 2 month. On imaging, plain radiographs of right hand showed expansile lytic lesion on Metaphyseal-diaphyseal region of 4th metacarpal with pathological fracture. MRI showed cystic lesions with internal loculations and fluid-fluid levels (Fig 2). There was minimal soft tissue extension. We performed aspiration which showed serosanguinous fluid with haemorrhagic tinge. With the diagnosis of unicameral bone cyst in mind we performed and closed intramedullary nail with k wire. The cyst healed up completely within 2 months. There was no recurrence at 18 month follow up.

Conclusion: In conclusion simple bone cyst is very rare in metacarpal bone. However it should be considered as important differential since it warrants simple treatment and extensive procedures should be avoided.

Keywords: simple bone cyst, metacarpal, k wire.

Introduction

Simple bone cyst or unicameral bone cyst (UBC) are benign cystic lesions seen commonly in skeletally immature persons [1]. Males are twice more commonly affected than females [1]. Common sites of occurrence are femur and humerus [1]. UBC are also seen in tibia, calcaneus, cuboid, lumbar spine and pelvis [2]. Hand is a very rare site of occurrence. Very few cases of UBC have been described in hand include metacarpals [3,4]; phalanx [2,5]; hamate [6] and lunate [7]. Treatment described for UBC of hand commonly involves

curettage and bone grafting [2, 3, 4, 5, 6, 7]. We describe UBC of metacarpal in a skeletally immature girl with diagnostic dilemma treated simply with closed k wire insertion. No recurrences seen at 18 month follow up.

Case Report

A 7 year old right hand dominant girl presented to us with chief complaints of pain and swelling in right 4th metacarpal since 2 month. The pain was dull aching and constant with no diurnal variation. Swelling was of insidious onset and

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Author's Photo Gallery



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Figure 1: cystic lesion at meta diaphyseal region with pathological fracture

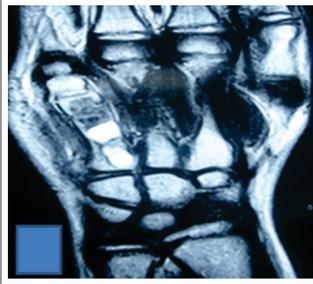


Figure 2: T2w coronal section showing fluid fluid levels in cystic lesion of 4th metacarpal



Figure 3A: immediate postoperative radiograph; **3B:** at 1 month follow up cyst showing signs of healing; **3C:** at 2 month follow up the cyst is completely healed

gradually progressive. No history of trauma or infection. No other symptoms were present. Her medical, personal and family history was not significant. On examination, it was a solitary, diffuse and bony hard swelling over 4th metacarpal of right hand which was tender on palpation and no local rise in temperature. The range of movement at 4th metacarpophalangeal joint was terminally restricted due to pain in all directions. No other swelling present in other parts of the body. There was no sensory-motor deficit and distal circulation was normal.

Patient was earlier seen by various orthopaedic surgeons who investigated the lesion and advised excision of cyst with bone grafting. On imaging, plain radiographs of right hand showed expansile lytic lesion on Metaphyseal-diaphyseal region of 4th metacarpal with pathological fracture. MRI showed cystic lesions with internal loculations and fluid-fluid levels (Fig 2). There was minimal soft tissue extension. Routine laboratory investigations, coagulation profile and metabolic profile were normal. Serum alkaline phosphatase was slightly raised. We repeated the plain radiograph which showed expansile lesion with pathologic fracture on 4th metacarpal (Fig 1). With these investigations available we performed a biopsy which showed serosanguinous fluid with haemorrhagic tinge. With the diagnosis of unicameral bone cyst in mind we performed and closed intramedullary nail with k wire (Fig 3A). The cyst showed signs of healing within a month (Fig 3B) and k wire was removed. The cyst healed up completely within 2 months (Fig 3C). There is no recurrence at 18 month follow up and range of motion is full at metacarpophalangeal joint.

Discussion

The differential diagnosis of lytic cystic lesion in hand in a skeletally immature patient include unicameral bone cyst, aneurysmal bone cyst, osteoblastoma, giant cell reparative granuloma, enchondroma and intraosseous ganglion cyst [2]. Intraosseous ganglion cyst is a benign lesion commonly seen in carpus and presents as expansile lesion. Histologically it contains myxoid material [8]. Enchondromas are cartilage forming lesions and are most common benign lesion in hand. They present as well circumscribed lytic lesion in metadiaphysis. Histologically presents with presence of cartilage cells [9]. Giant cell reparative granuloma is reactive benign lesion classically seen in skull and facial bones and also in small tubular bones of hands and feet. Histologically these presents with fibroblasts, multinucleated giant cells and areas of haemorrhage [10]. Osteoblastoma are benign bone forming lesion commonly found in spine and rarely in hand. On radiograph they

present as area of lucency with surrounding sclerosis. On histopathology they show presence of osteoblasts [11]. Osteoblastoma, enchondroma, intraosseous ganglion cyst and giant cell reparative granuloma were excluded in our case based on typical histopathology findings.

Aneurysmal bone cyst (ABC) presents as eccentric expansile lesion with blood filled cavities. On MRI it shows fluid-fluid levels, however this finding is not specific for it [12]. UBC are centric expansile lesion in the metaphysis-diahyseal location. Radiograph may show classic "fallen leaf sign" representing a piece of bone due to pathologic fracture [13].

The characteristic fluid-fluid level seen in ABC is due to sedimentation of erythrocytes within serosanguinous fluid [14]. This finding is observed only in 60% of cortical ABC [15].

The other lesions showing fluid-fluid levels are chondroblastoma, telangiectatic osteosarcoma, fibrous dysplasia, unicameral bone cyst, giant cell tumour, intraosseous ganglion cyst, plasmacytoma and osteomyelitis [15].

Thus in our case the lesion can still be either UBC or ABC. To further reach the diagnosis we performed aspiration of the lesion. The aspirate was serosanguinous with hemorrhagic tinge. The hemorrhagic tinge can be due to associated pathological fracture. Thus with all above findings radiograph, MRI and aspiration taken together an informed diagnosis of UBC was made in our case of centric expansile lesion with fluid fluid level and serosanguinous aspirate.

Treatment options for UBC include observation, curettage and bone grafting, intralesional steroid injection [1] and recently intramedullary nailing [16]. Baruch et al performed curettage and bone grafting for two cases of metacarpal UBC [4]. Recurrence of cyst remains the main complication regardless of treatment option [1].

Various theories have been proposed in pathogenesis of UBC like dysplasia within the cyst due to trauma, intraosseous synovial cyst and more recently venous occlusion leading to increased intramedullary pressures [1]. Thus leading to conclusion that re-establishing these vascular channels may lead to healing of cyst.

Use of titanium elastic nails to open the connection between the medullary canal and cyst and break the septae within the cyst have been well documented in treatment of long bones UBC [16]. Hence we used a k wire to break the septae and provide intramedullary support. The cyst showed signs of healing within a month and was completely healed in 3 months with no recurrence till date.

Conclusion

Simple bone cyst is very rare in metacarpal bone. However it should be considered as important differential since it

warrants simple treatment and extensive procedures should be avoided.

Clinical Message

Unicameral bone cyst of metacarpal although rare should be kept in mind while diagnosing cystic lesion since it requires simple treatment.

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