

CONSERVATIVE TREATMENT VERSUS STEROID INJECTIONS IN THE MANAGEMENT OF UNICAMERAL BONE CYST

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ABSTRACT

BACKGROUND

Unicameral Bone Cyst (UBC) is described as a central metaphyseal cystic lesion of the bone with serum fluid content. Diagnosis is typically based on x-ray imaging features, age, localisation at proximal humerus and femur and the absence of symptoms until pathological fracture development.

MATERIALS AND METHODS

Eighteen patients with unicameral bone cysts were reviewed in Nalanda Medical College Hospital. Nine patients received serial steroid injections and the other nine patients were treated conservatively following fractures. In the steroid injection group, six cases were in the proximal femur and three in the proximal humerus.

RESULTS

The nine steroid injection patients showed radiological evidence of cyst healing within four months of treatment. Subsequently, all 9 patients showed a satisfactory radiological outcome after a year and complete resolution after 2 years. In the conservative group, all 9 cases were in the proximal humerus. Persistent cystic lesions were observed in all 9 patients and 2 was complicated by another fracture within 6 months.

CONCLUSION

Fractures through UBC in the upper extremity can be treated nonoperatively. However, steroid injection is an effective option to hasten healing and should be considered as a primary treatment of unicameral bone cyst.

KEYWORDS

Unicameral Bone Cysts, Steroid Injections.

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BACKGROUND

Unicameral Bone Cyst (UBC) is described as a central metaphyseal cystic lesion of the bone with serum fluid content. Diagnosis is typically based on x-ray imaging features, age, localisation at proximal humerus and femur, and the absence of symptoms until pathological fracture development.¹ X-ray imaging shows a smooth, well-defined thin cortex with no significant septation. UBCs are often asymptomatic and are only discovered due to pain from an associated fracture or as an incidental finding. The lesion is most active during period of skeletal growth and usually heals spontaneously at maturity.^{1,2} The only indication for treatment of a UBC is to decrease the potential risk of pathologic fracture as they are otherwise benign and self-limiting. Two-thirds of UBC patients present with a fracture, which stimulates the cyst to heal.^{1,2} The preferred method

of treatment remains controversial.^{3,4,5,6} In the past, treatment consisted of curettage and bone grafting with a recurrence rate of approximately 20%. At present, the mainstay of treatment is minimally invasive and has a significant success rate, steroid injections, administration of autologous bone marrow, decalcified bone matrix or sclerosing agent and minimally-invasive stabilisation.^{3,4,5,6}

MATERIALS AND METHODS

In all cases, diagnosis of UBC was based on diagnostic imaging features, age, localisation at the proximal humerus and femur and absence of symptoms until development of pathological fracture. Only radiographic images showing a smooth, continuous, well-defined thin cortex with no significant septation were included in the series. Diagnosis was further confirmed by clear serosanguineous fluid extracted before injection of steroids. Nine patients underwent serial steroid injections for UBC. There were 7 males and 2 females with age range between 10 to 16 years. Five cysts were located at the proximal femur and another 4 at the proximal humerus. Seven patients presented with pathological fracture and 2 with deep-seated dull pain. Five patients with proximal humerus fractures were treated with U-slab and 2 patients with a femur fracture was treated with traction followed by spica cast. There was no radiological improvement of the lesion on follow-up despite fracture and

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the patients were subsequently managed with steroid injection. Steroid injections were administered in the operating room with the patient under general anaesthesia. Fluoroscopic guidance was used to visualise the 16 gauge

bone marrow needle as it penetrated the cortex overlying the lesion. Direct aspiration of the cystic fluid was performed until fresh bleeding was seen and subsequently steroid was injected.

Age	No. of Cases	Site	Presentation	No. of Steroid Injections	Follow up (Months)	Outcome
10	2	Rt. femur	Pain	3	24	Healed
11	1	Rt. humerus	Incidental x-ray finding	3	12	Healed
13	4	Lt. femur	Fracture	4	27	Healed
12	2	Lt. humerus	Dull pain	3	22	Healed

Table 1. Series of Nine Patients Treated with Steroids Injection

Age	No. of Patients	Site	Presentation	Refracture (Months)	Follow up	Outcome (Symptoms)
13	4	Humerus	Deep seated pain	8	24	Refracture
14	3	Femur	Fracture	-	36	Healed
11	2	Humerus	Fracture	6	12	Refracture

Table 2. Series of Nine Patients Treated Conservatively

We used 80-120 mg of Depo-Medrol depending on the size of the patient and the specific lesion as well as the age of the patient. Three to four injections were administered to all patients over a six month period. Five patients were treated conservatively with U-slabs following pathological fracture of the proximal humerus. All patients in this case series were evaluated for clinical and radiological improvement every 3 months. Healing of the cyst was defined as obliteration of cyst by new bone formation. Radiological healing was evaluated according to the Neer grading systems 2.

RESULTS

In the steroid group, 9 cases had satisfactory radiological and clinical outcomes following steroid injections. These patients were able to achieve normal daily activities without pain at last follow-up. Radiological healing of the cyst was observed in all patients. One case was still in the early treatment phase, however, already showed grade 3 radiological findings. In the conservative treatment group, fracture healing was observed at 8 weeks and all patients were fully functional at 3 months. Radiological healing of the cyst around the fracture area was present, but not complete in all patients. Three patients had partial radiological healing (grade 2) and 6 patients had a remaining cyst of grade 3. Six patients subsequently developed another fracture at a different site within 6 months and healed with further conservative treatment.

DISCUSSION

UBC is asymptomatic in the majority of patients. The only indication for a surgical procedure in UBC treatment is either when the patient has high potential for development of a pathological fracture or pain. Small lesions in non-weightbearing bones can be treated expectantly, but operative treatment should be considered in cases with large cysts situated in high stress areas.^{1,2} Surgical options include aspiration of cystic fluid with injection of steroids or curettage and bone grafting with or without internal fixation.³⁻⁷ Recently, synthetic calcium sulphate with BMP for

cyst filler and placement of cannulated screw for continuous fluid drain have been reported to have good success.³⁻⁶ Pathological fractures in the upper extremity can be treated nonoperatively as the fracture itself may initiate healing. In our patients, cyst healing was not complete in all patients treated conservatively. However, all patients had a good clinical outcome. Many authors have advocated serial steroid injections as a primary treatment of UBC. Clinical and radiological improvement was reported to be as high as 95% and was comparable with curettage and bone grafting.⁷ It is a minimally-invasive procedure, technically not demanding and has less morbidity. All cases in our series responded well to serial steroid injections. The technique is hypothesised to work by an anti-prostaglandin effect; prostaglandin has been identified as present in the cystic fluid, regulating osteoclastic activity.⁸ In addition, aspiration decreases the pressure of the cyst, which is thought to cause focal bone necrosis and fluid accumulation.^{5,6,8} The limitations of this study are the small number of patients and the fact that most patients were not skeletally mature.

CONCLUSION

Fractures through UBC in the upper extremity can be treated nonoperatively. However, steroid injection is an effective option to hasten healing and should be considered as a primary treatment of unicameral bone cyst.

REFERENCES

- [1] Campanacci M, Capanna R, Picci P. Unicameral and aneurysmal bone cysts. Clin Orthop Relat Res 1986;204:25-36.
- [2] Neer CS, Francis KC, Marcove RC, et al. Treatment of unicameral bone cysts: a follow up study on one hundred seventy-five cases. J Bone Joint Surg Am 1966;48(4):731-745.
- [3] Di Bella C, Dozza B, Frisconi T, et al. Injection of demineralised bone matrix with bone marrow concentrate improves healing in unicameral bone cyst. Clin Orthop Relat Res 2010;468(11):3047-3055.

- [4] Hou HY, Wu K, Wang CT, et al. Treatment of unicameral bone cyst: a comparative study of selected technique. J Bone Joint Surg 2010;92(4):855-862.
- [5] Mik G, Arkader A, Manteghi ABS, et al. Result of a minimally invasive technique for treatment of unicameral bone cysts. Clin Orthop Relat Res 2009;467(11):2949-2954.
- [6] Sung AD, Anderson ME, Zurakowski D, et al. Unicameral bone cyst: a retrospective study of three surgical treatments. Clin Orthop Relat Res 2008;466(10):2519-2526.
- [7] Oppenheim WL, Galleno H. Operative treatment versus steroid injection in the management of unicameral bone cyst. J Pediatr Orthop 1984;4(1):1-7.
- [8] Cohen J. Simple bone cysts. Studies of cyst fluid in six cases with a theory of pathogenesis. J Bone Joint Surg 1960;42A:609-616.