



Tension Side Femoral Neck Fracture due to Simple Bone Cyst in a Low Resource Area; A Report of Case

**Ayman Taj Elsir Mustafa Babiker¹, Mahmoud Alballa Almahdi Alhag²,
Hozifa Mohammed Ali Abd-Elmaged^{3*}, MohammedAlssir Ibrahim
Mustafa MohammedAhmed⁴, Mohamed Elfatih Mohamed Abdalla⁵
and Osama Abdelmarouf Hussein⁶**

¹Consultant Orthopaedics and Trauma, Atbara Teaching Hospital, Atbara, Sudan

²Teaching Assistant, Al Zaeim Al Azhari University, Khartoum, Sudan

³Assistant Professor of Orthopaedic, Al Zaeim Al Azhari University, Khartoum, Sudan

⁴Assistant Professor of Orthopaedic, Ahfad University for Women, School of Medicine, Khartoum, Sudan

⁵Teaching Assistant, Al Zaeim Al Azhari University, Khartoum, Sudan

⁶Assistant Professor of Orthopaedic, Nile University, Khartoum, Sudan

***Corresponding Author:** Hozifa Mohammed Ali Abd-Elmaged, Assistant Professor of Orthopaedic, Al Zaeim Al Azhari University, Khartoum, Sudan.

Received: May 25, 2023

Published: July 18, 2023

© All rights are reserved by **Hozifa Mohammed Ali Abd-Elmaged, et al.**

Abstract

Background: A unicameral bone cyst is a benign bone lesion with a thin membrane enclosing serous fluid or serosanguinous fluid. It is typically asymptomatic. From the time of birth to the age of 20, males are more likely to develop it than females (3 males to 1 female). There is no universally accepted method for treating this problem, but the patient's age, level of activity, and bone size and strength are very important factors in determining the best course of action. Immobilization, aspiration, methylprednisolone injections, curettage, and bone grafting with or without internal fixation are among the treatment possibilities.

Case presentation: The patient presented to the orthopaedic department at Atbara Teaching Hospital with limbing and right-sided knee pain for three months. One day before admission, he presented with severe right hip pain and inability to bear weight. X-ray showed a cystic lesion on the femoral neck, with incomplete superior femoral neck fracture and fallen leaf sign.

Intervention and prognosis: Performing Bone Curettage, immobilization, and bone marrow aspiration causes the patient to conduct weight bearing activities.

Conclusion: UBC's approach to treating this young male opens the door to a new era of treatment.

Keywords: Orthopedics; Bone Cysts; Curettage; Prognosis

Introduction

A unicameral bone cyst is a benign bone lesion that is usually asymptomatic, containing serous fluid or serosanguinous fluid within a thin membrane [1]. In long bones like the humerus and femur, they often occur in the center of the metaphyseal area [2]. It has more tendency to occur from the age of birth till 20 years, and usually in male (3 male: 1 female) [3].

There is no exact explanation for the etiology, but there are some theories; one suggests that a defect in bone growth results

in fluid filling the defect, eventually causing it to thin and expand [4]. Other theory states that a venous obstruction is the reason why they develop within the bone [5].

In many cases, they are discovered incidentally or following a fracture during imaging and may regress on their own. Currently, there is no consensus on how to treat this condition. However, the patient's age and activity level, as well as bone size and strength, play a crucial role in choosing the right treatment option. In addition to immobilization, aspiration, and injections of methylprednisolone,

more invasive procedures such as curettage and bone grafting with or without internal fixation are possible depending on the location of the tumor [6].

Case Presentation

11 years old male presented to the orthopaedic department at Atbara Teaching Hospital, with limbing and right-sided knee pain for three months. The pain was atraumatic, progressive in nature, increased in intensity during walking and not relieved completely by taking oral anti-inflammatory medications. Additionally, no constitutional symptoms (fever, weight loss or fatigability). One day before admission, the patient presented to the ER complaining of sudden severe right hip pain, along with inability to bear weight while walking in school. On examination, there was tenderness over anterior hip, painful range of motion (ROM), painful gait, and no leg deformity. Knee examination was normal.

X-ray of the right lower limb shows cystic lesion on the femoral neck, which is central with well-define margin, narrow zone of transition, along with incomplete superior femoral neck fracture, and appearance of fallen leaf sign. CT scan confirms the fracture and the fallen leaf signs. Therefore, the patient diagnosed with unicameral bone cyst causes pathological fracture.

Intervention and Prognosis

Bone Curettage procedure was performed along with fixation with K wire under image intensifier. In addition, bone marrow aspiration (4Cc) was taken from iliac bone, and both with the curettage material confirm the diagnosis as UBC.

After 6 weeks, the K wire removed at the office, and there were no post-operative complications detected. The patient started to bear weight gradually at the 6th week and became fully weight bearing at the 10th week post-operative. During follow-up for 1 year, the patient has normal activity, playing football, and has no complain.

Discussion

A unicameral pelvic bone cyst occurs in 2% of reported cases. This condition is typically associated with the unloaded portions of the ilium during skeletal development. According to Hammoud., *et al.*, it is often the anterior part of the pelvic wing [7]. To achieve a successful outcome, surgical and non-surgical treatment modalities need to be tailored to the specific pathological pattern of the cyst. The objective is to relieve pain and prevent fractures. In asymptomatic patients without a significant reduction in the strength of the affected bone, nonsurgical approaches such as im-

mobilization or observation are recommended. When latent cysts that are symptomatic and have not responded to steroid injections are indicated for surgery, as well as those near the femur and at risk of fracture or osteonecrosis, or when pathological fractures are caused by UBC and must be fixed internally in order to prevent malunion and refraction [8].

In terms of cure rates and decrease in bone deformities, percutaneous curettage in conjunction with intra-cystic injections of methylprednisolone and autologous bone graft have been shown to be highly effective [9].

In our case, usage of surgical curettage along with aspiration of the cyst and Immobilization considered to be suitable approach of treatment with complete recovery within more than 10 weeks to 1 year.



Figure 1: Preoperative X-ray shows neck cystic lesion, central, narrow zone of transition, with superior fracture neck of femur and leaf sign.

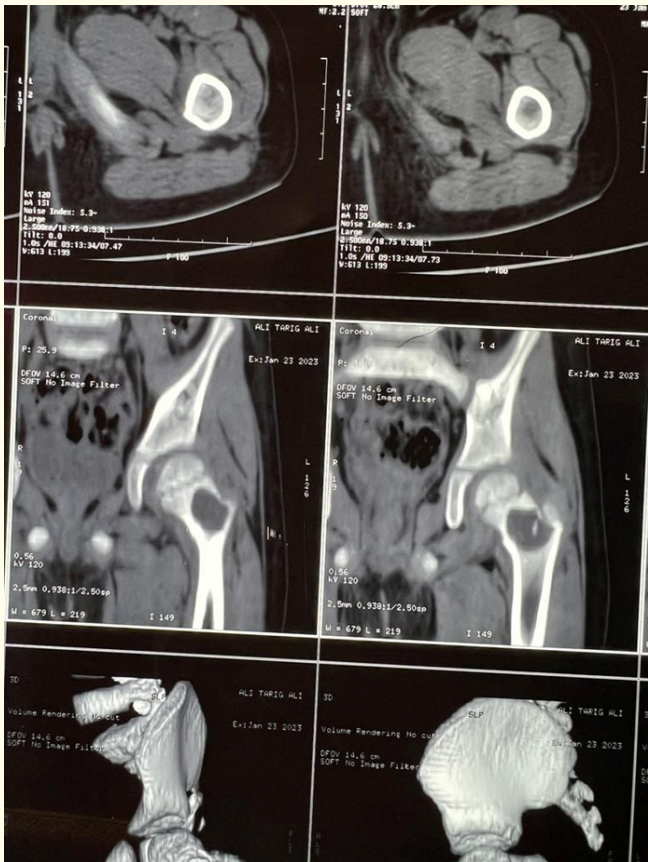


Figure 2: CT scan shows cystic lesion and fallen leaf sign.



Figure 3: After performing bone marrow aspiration.



Figure 4: Immediate post-operative X-ray.



Figure 5: After removal of K wire 6 weeks post-operation.

Conclusion

There is always a focus in medicine on reducing patients' suffering, preventing patients from degrading further, and improving the quality of life of the patient. We believe that the approach we took to treat this very young male and achieve the good results described above, opens the door to a whole new era of treatment for UBC in the upcoming days.

Ethical Consideration Statement

Written informed consent obtained from the patient to publish this report. There is no conflict of interest related to this publication and this work did not receive any funding.

Bibliography

1. Rosenblatt J and Koder A. "Understanding Unicameral and Aneurysmal Bone Cysts". *Pediatrics In Review* 40.2 (2019): 51-59.
2. Dormans JP, *et al.* "Percutaneous intramedullary decompression, curettage, and grafting with medical-grade calcium sulfate pellets for unicameral bone cysts in children: a new minimallyinvasive technique". *Journal of Pediatric Orthopaedics* 25.6 (2005): 804-811.
3. Wünnemann F, *et al.* "Zufallsbefunde in der muskuloskeletalen Radiologie [Incidental findings in musculoskeletal radiology]". *Radiologe* 57.4 (2017): 286-295.
4. Noordin S, *et al.* "Unicameral bone cysts: Current concepts". *Annals of Medicine and Surgery (London)* 34 (2018): 43-49.
5. Mascard E, *et al.* "Bone cysts: unicameral and aneurysmal bone cyst". *Orthopaedics and Traumatology: Surgery and Research* 101.1 (2015): S119-127.
6. Liu Q, *et al.* "Active unicameral bone cysts: control firstly, cure secondly". *Orthopaedics Surgery and Research* 14.1 (2019): 275.
7. Hammoud S, *et al.* "Unicameral bone cysts of the pelvis: a study of 16 cases". *Iowa Orthopedic Journal* 25 (2005): 69-74.
8. Evans J, *et al.* "Unicameral Bone Cyst. StatPearls. Treasure Island (FL): StatPearlsPublishing. Copyright®, StatPearls Publishing LLC (2022).
9. Delizo SM and FPOA IE. "Treatment Combination of a Unicameral Bone Cyst of the Pelvis.