



Post-Traumatic Fibular Aneurismal Bone Cyst: A Case Report and Review of the Literature

Gülşen Aykol¹, Mehmet Fatih Erbay²

¹Physical Medicine and Rehabilitation, Private Sevgi Medical Centre, Malatya, Turkey

²Radiology, Private Gözde Academy Hospital, Malatya, Turkey

Abstract

Aneurismal bone cysts are benign and rarely encountered lesions of the skeletal system. They are usually seen in the first decade of life, often in the long bones. The case is presented here of a 13-year old male who presented at our polyclinic with complaints of pain in the right knee following an acute trauma and was incidentally determined with an aneurismal bone cyst in the proximal fibula which had progressed without any symptoms. The MRI and direct radiography findings are presented. The aim of this paper was to draw attention to diseases which may be asymptomatic and present with complaints of frequent pain, swelling or pathological fractures.

Key Words: aneurismal bone cyst, undefined, post-trauma

(Rec.Date: Sept 22, 2014

Accept Date: Sept 25, 2014)

Corresponding Author: Gülşen Aykol, Physical Therapy and Rehabilitation, Private Sevgi Medical Center, Malatya, Turkey.

E-mail: gaykol@hotmail.com

Phone: +90 422 324 4646

Introduction

Aneurismal bone cysts (ABC) are rarely-seen bone lesions which resemble tumours in appearance and are expansile and benign in character but behave aggressively locally. They constitute approximately 1% of all primary bone tumours.

Although they may be seen throughout the skeleton, 65% are seen in the long bones (mostly in the metaphysis). In addition, the lesion may have involvement in the pelvis and posterior elements of the vertebrae. In a demographic examination of 411 cases, the most common locations were defined as femur (22%), tibia (17%), spine (15%), humerus (10%), pelvis (10%) and fibula (9%) [1]. Female to male incidence is approximately 1:2 and 80% of cases are below the age of 20 years.

Besides the primary types of aneurismal bone cysts which are seen alone, there are secondary forms which are seen together with benign tumours such as chondroblastoma and osteoblastoma or with malignant tumours such as osteosarcoma and malignant fibrous histiocytoma [2]. Primary forms are seen in 70% of cases and secondary in 30%.

Clinically, patients present with complaints of mild pain and swelling or pathological fractures. Complaints of pain are at the forefront in weight-bearing joints. Pathological fractures are rarely seen [3]. Delayed diagnosis makes treatment more difficult.

Case

A 13-year old male presented at our polyclinic with the complaint of pain in the right leg following trauma of being kicked in the back of the right knee while playing a game. The patient had no previous complaints and physical examination revealed mild oedema in the upper lateral right leg and evident sensitivity and pain on palpation. There were no findings consistent with cutaneous bleeding, open wound or haematoma. The patient had no history of any other trauma. The haemogram and routine biochemical values were within normal limits. On direct radiograph, a lytic lesion observed in the proximal fibula, which was expanding the bone (Figure 1). On magnetic resonance imaging (MRI), a cystic lesion was observed of fluid-fluid levels with multiple septa, which was located in the metaphysodiaphysis in the proximal right fibula with expansion in the bone and causing thinning of the cortex (Figures 2,3,4). On computed tomography (CT), a lytic bone lesion was observed in the diaphysis of

the right proximal fibula, 4x2 cm in size, which was expanding the bone and thinning the cortex (Figure 5).

Resection and grafting (from the iliac wing) were applied to the proximal right fibula and as a result of the histopathological examination of the total excision material, an evaluation was made of aneurismal bone cyst. After 7 months follow-up, no recurrence has been determined in the patient.

Figure 1. Bilateral knee AP direct radiograph.



Discussion

Aneurismal bone cysts, which affect children and young adults in particular, are non-neoplastic benign lesions of the bone. The lesion is characterised pathologically with cavities full of blood, separated with fibrous septa containing trabecular or osteoid tissue and osteoclastic giant cells [4].

Clinically, patients often present with complaints of pain and swelling. Previous studies have determined pain (65-93%) most often in diagnosis, followed by swelling (15-18.1%). Palpable tumour and joint contracture have been reported less often (8%). The incidence of pathological fracture has been reported at rates varying from 3.4% to 25.9%. In a study by Flont et al, a period of delay of approximately 21 weeks was determined from the onset of symptoms to treatment [8]. Other studies have determined this period as 14 [5], 24 [6] and 27 [7] weeks. In the case presented here, the fibular ABC was determined incidentally following acute trauma rather than from any symptoms or complaints.

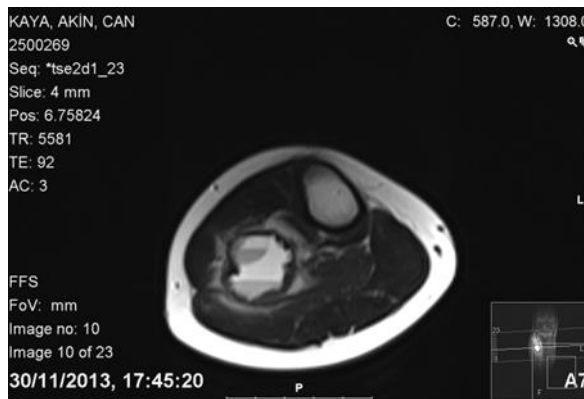


Figure 2. Right knee MRI axial T2A slice-fluid levels



Figure 4. Right knee MRI sagittal T2A fat suppressed



Figure 3. Right knee MRI coronal T1A slice



Figure 5. Right knee multislice CT pre-operative image

The age of the patient, the anatomic localisation of the lesion and clinical and radiographic findings are important in the diagnosis. In radiological diagnosis, evaluation is made with direct radiography, computed tomography (CT) and MRI together. The main radiographic characteristics are aneurismal cystic expansion of the bone without evident matrix mineralisation. Together with periosteal new bone formation, sclerotic rings are often seen. Generally, reactive sclerosis is observed in a narrow transition zone. On CT, lytic lesions including bone sheath in the periphery are observed. The presence of fluid-fluid level in the lesion is characteristic of ABC but not specific to it. Typical MRI findings are seen as internal septation, fluid-fluid level and a rim in the outer surface of the cyst [6]. On MRI, the internal septa are seen with a honeycomb appearance and the visualisation of the septa is important in the differential diagnosis of the lesion from other cystic lesions.

With surgical removal of the lesion, it is possible to make an accurate diagnosis of ABC, to remove the complaints and prevent complications.

In differential diagnosis, telangiectatic osteosarcoma and giant cell bone tumour must be evaluated [9]. In giant cell bone tumours, reactive sclerosis is not observed. In a study by Sundaram et al, 4 cases were reported showing similarities to ABC in respect of imaging findings but with different histopathological diagnoses [10]. Attention was drawn to the similarities of telangiectatic osteosarcoma and giant cell variants in particular.

Various methods have been described for treatment such as excision of the extended wall, curettage and grafting, cryotherapy, phenol injections, arterial embolisation, radiotherapy, applications of bone cement, demineralised bone matrix, fibrosan material (ethiblock) and segmentary resections.

Despite the benign character of aneurismal bone cysts, the rates of recurrence after treatment are extremely high. Currently, the most common treatment choice is curettage and grafting. Recurrence rates are lower with en bloc excision but extensive reconstructive surgery is associated with higher rates of morbidity. In local cysts in the proximal fibula, distal ulna, ribs, pubic bone, metatarsal and metacarpal bones, the recommended treatment is bone excision [11].

The curettage method has the potential for high local recurrence after treatment. Campanacci et al reported local recurrence probability at 21% after curettage. While relapse was determined more often in active (25%) and aggressive (26%) lesions, after curettage of inactive lesions and after en bloc excision, recurrence was not observed. In the light of these findings, Campanacci et al recommended cryotherapy or deep curettage with additional phenol in the treatment of more aggressive cysts [11].

In a study by Lin et al, recurrence after curettage was reported as 18.9%. Recurrence was determined in large cysts in patients aged below 12 years and in cases where the cyst was directly adjacent to the joint cartilage or the growth plate [12].

Similarly, Mankin et al determined recurrence at 22% after curettage and at 5% after en bloc excision [13].

In a retrospective study by Campanacci et al in which 185 patients were evaluated, it was reported that recurrence developed in 2-72 months [11]. In a similar studies, Ramirez and Stanton determined this period to be mean 18.7 months [7] and Flont et al reported a period of 4-39 months [8]. Follow-up after treatment is recommended for the evaluation of recurrence.

In a study by Gibbs et al, a significant relationship was determined between a high recurrence rate and the presence of open growth plates and a young age [5].

Therefore, adjuvant therapies together with curettage, such as cementing, cryotherapy or embolisation are considered in treatment. Recent developments in ABC treatment include an adjuvant such as phenol, hydrogen peroxide, liquid nitrogen, methyl methacrylate or argon together with curettage. Sclerotherapy [14] or embolisation [15] are seen as other alternative treatments to surgery. Particularly in axial skeletal involvement such as the pelvis, spine or sarum, a surgical approach to lesions is not preferred. Intralesional 32P chromic phosphate injection has been shown to be a new treatment choice for ABC in axial skeletal involvement [16].

Radiotherapy is not a current preference due to the risk of osteonecrosis, shortness in limb length, gonadal damage and sarcoma development.

The aim of this paper was to draw attention to the period without symptoms of ABC patients who often present with pain and swelling and rarely with a space-occupying mass or pathological fracture. When the relationship between recurrence rates and destruction of joint cartilage and growth plate by the tumour is considered, early diagnosis reduces the probability of recurrence by surgical reduction of the borders. As there is often a lengthy period between the onset of symptoms and treatment of the lesion, ABC should be kept in mind, especially in the differential diagnosis of children and adolescents presenting with joint pain.

References

1. Cottalorda J, Kohler R, Sales de Gauzy J, Chotel F, Mazda K, Lefort G, Louahem D, Bourelle S, Dimeglio A. Epidemiology of aneurysmal bone cysts in children: a multicenter study and literature review. *J Pediatr Orthop B*. 2004;13(6):389-94.
2. Cottalorda J, Bourelle S. Current treatments of primary aneurysmal bone cysts. *J Pediatr Orthop B*. 2006; 15(3):155-67.
3. Cheah HK, Griffin AM. Aneurysmal bone cyst of pelvis. *Can J Surg*. 1999;42(6):411-2.

4. Lampasi M, Magnani M. Aneurysmal bone cyst of distal fibula in children. *J Bone Joint Surg.* 2007;89(10):1356-62.
5. Gibbs CP, Hefele MC, Peabody TD, Montag AG, Aithal V, Simon MA. Aneurysmal bone cyst of the extremities. Factors related to local recurrence after curettage with a high-speed burr. *J Bone Joint Surg Am.* 1999;81(12):1671-8.
6. Vergel de Dios AM, Bond JR, Shives TC, McLeod RA, Unni KK. Aneurysmal bone cyst. A clinicopathologic study of 238 cases. *Cancer.* 1992;69(12):2921-31.
7. Ramirez AT, Stanton RP. Aneurysmal bone cyst in 29 children. *J Pediatr Orthop.* 2002;22(4):533-9.
8. Flont P, Kolacinska-Flont M, Niedzielski K. A comparison of cyst curettage and en bloc excision in the treatment of aneurysmal bone cysts. *World Jour Surg Oncol.* 2013;11:109.
9. Kapoor H, Singh D, Bhatia N, Chaudhary D, Singh AK. Distal tibial aneurysmal bone cyst treatment by using a proximal fibular autologous bone graft: a case report. *J Foot Ankle Surg.* 2004;43(3):179-84.
10. Sundaram M, Tooty WG, Kyriakos M, McDonald DJ, Merkel K. Imaging findings in pseudocystic osteosarcoma. *AJR Am J Roentgenol.* 2001;176(3):783-88.
11. Campanacci M, Capanna R, Picci P. Unicameral and aneurysmal bone cyst. A clinicopathologic study of 238 cases. *Clin Orthop Relat Res.* 1986;204:25-36.
12. Lin PP, Brown C, Raymond AK, Deavers MT, Yasko AW. Aneurysmal bone cysts recur at juxtaepiphyseal locations in skeletally immature patients. *Clin Orthop Relat Res* 2008;466(3):722-8.
13. Mankin HJ, Hornicek FJ, Ortiz-Cruz E, Villafuerte J, Gebhart MC. Aneurysmal bone cyst: a review of 150 patients. *J Clin Oncol.* 2005;23(27):6756-62.
14. Rossi G, Rimondi E, Bartalena T, Gerardi A, Albergini M, Staals EL, Errani C, Bianchi G, Toscana A, Mercuri M, Vanel D. Selective arterial embolization of 36 aneurysmal bone cyst of the skeleton with N-2-butyl cyanoacrylate. *Skeletal Radiol.* 2010;39(2):161-7.
15. Varshney MK, Rastogi S, Khan SA, Trikna V. Is sclerotherapy better than intralesional excision for treating aneurysmal bone cysts? *Clin Orthop Relat Res.* 2010;468(6):1649-59.
16. Bush CH, Adler Z, Drane WE, Tamurian R, Scarborough MT, Gibbs CP. Percutaneous radionuclide ablation of axial aneurysmal bone cysts. *AJR Am J Roentgenol.* 2010;194(1):W84-90.