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Osteochondroma of the proximal femur: A case study and review of literature

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ABSTRACT: Osteochondroma is the most common benign bone tumour. It accounts for approximately 35% of benign bone tumours and 9% of all bone tumours. Most are asymptomatic, but they can cause mechanical symptoms depending on their location and size. Following the completion of dissection we used the dissected parts for bone maceration. We observed a projection at the proximal femur just distal to the greater trochanter that is hook like, extending downward for a distance of 3cm. Obviously there was no muscle attachment to them. This hook like projection was x-rayed and we confirmed that the cortex of the lesion is continuous with the cortex of the femur with a homogeneous continuation of the medulla. This was then identified as a case of osteochondroma. Admittedly, because the history of the individual was not available in the present case, it is not possible to comment upon the clinical profile resulting from the anomaly. However femoral anteversion, valgus, impairment of hip flexion acetabular dysplasia resulting in subluxation of the hip, valgus deformity of the knees and angular limb deformities are some of the defect commonly associated with osteochondromas affecting the proximal femur.

Key words: Osteochondroma; Proximal femur; Benign tumour.

Introduction

Primary bone tumours though very rare represent a tragedy for the patient especially the malignant tumours which are usually very fatal. Bone tumours that are benign are noncancerous, they do not spread and are usually not life threatening. However, they can grow and compress healthy bone tissue; they can also absorb or replace healthy tissue with abnormal tissue. Osteochondromas (osteocartilaginous exostoses), the most common benign bone tumours, may arise from any bone but tend to occur near the ends of long bones. Although the exact etiology of these growths is not known, a peripheral portion of the epiphysis is thought to herniate from the growth plate[1]. This herniation may be idiopathic or may be the result of trauma or a perichondrial ring deficiency resulting to abnormal extension of metaplastic cartilage that responds to the factors that stimulate the growth plate and thus results in exostosis growth [1].

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Rains and Mann stated that Ostechondroma is almost certainly the result of a localized disturbance of bone growth at an epiphysis where by a portion of the epiphyseal cartilage remains in the periosteum of the metaphyseal segment of the bone and then endochondral ossification takes place in it, usually in continuity with the metaphyseal cortex and as the cartilage cap proliferates, endochondral ossification continues, resulting to growth of the ostechondroma and with continuous bone growth the ostechondroma moves away from the epiphysis and tends to become hooked, its tip pointing away from the epiphysis [2].

Müller believed that osteochondromas arise from a primary defect in periosteal differentiation in which ectopic collections of cartilage cells arise from the proliferative layer of the metaphyseal periosteum [3]. Multipotent mesenchymal cells in the region of the perichondral groove of Ranvier have also been implicated in the development of osteochondromas [4].

The osteal portion of osteochondroma provides only a supportive stroma since the ablation of the cartilage cap alone result in cessation of growth of the osteochondroma [5].

Osteochondromas grow until skeletal maturity; growth generally stops once the growth plates fuse though slow growth from the cap may continue over time, but this usually stops by age 30 years [6].

As benign lesions, osteochondromas have no propensity for metastasis. In fewer than 1% of solitary osteochondromas, malignant degeneration of the cartilage cap into secondary chondrosarcoma has been described and is usually heralded by new onset of growth of the lesion, new onset of pain, or rapid growth of the lesion [7, 8].

Case Study

Following the completion of dissection we used the dissected parts for bone maceration. We observed a projection just distal to the greater trochanter (Figure 1, 2 and 3). This projection is hook like, extending downward for a distance of 3cm. Obviously there was no muscle attachment to them. This bilateral hook like projection was x-rayed (Figure 3n) and we confirmed that the cortex of the lesion is continuous with the cortex of the femur with a homogeneous continuation of the medulla. The origin of this exostosis was at the area where possibly the center of ossification of the greater tronchanter appears at the forth year to fuse with the shaft at the end of the 18th year [9].

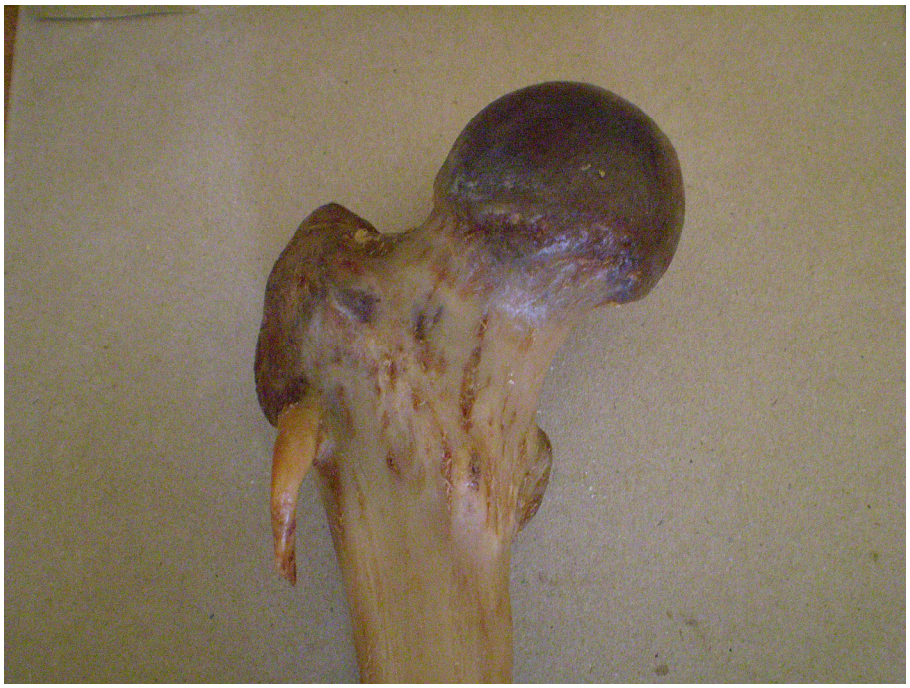

Figure 1: Anterior view of the right proximal femur showing the osteochondroma.

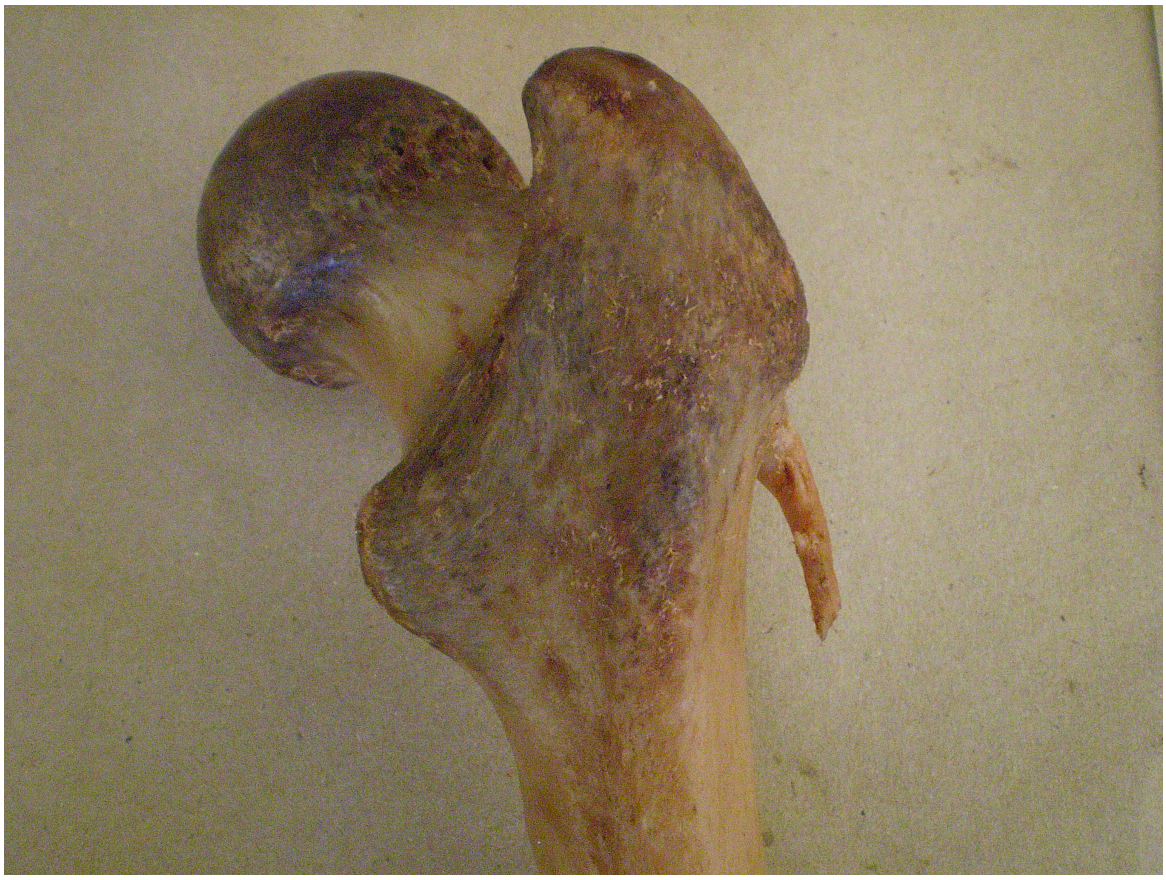

Figure 2: Posterior view of the right proximal femur showing the osteochondroma.

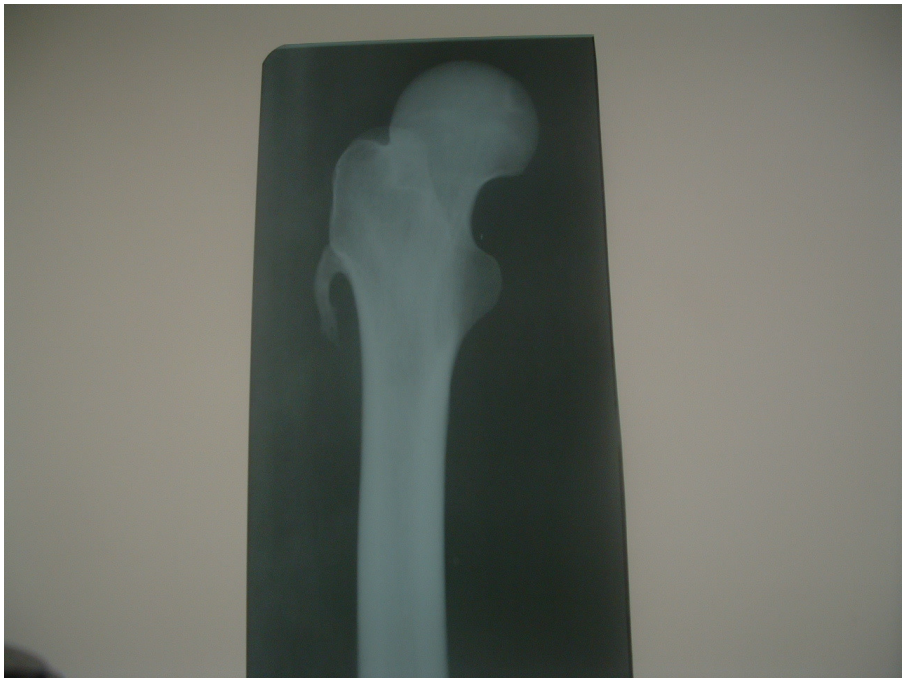

Figure 3: Anterior view of the x- rayed right proximal femur showing the osteochondroma.

Discussion:

We are dealing with a case of ossified osteochandroma of the proximal end of the right femur. The osteochondroma at the femur was solitary and pedunculate with its cortex continuous with the cortex of the proximal femur bone and also having a homogeneous continuity with its medulla. Most solitary osteochondromas discovered in children and adolescents are painless and are present as a slow-growing mass. However, depending on the location of the osteochondroma, significant symptoms may occur as a result of complications, such as fracture bony deformity, mechanical joint problems, vascular or neurologic compromise and even the risk of malignant transformation [10, 11]. Admittedly, because the history of the individual was not available in the present case, it is not possible to comment upon the clinical profile resulting from the anomaly but we do not think that this hook liked osteochondroma may cause some serious symptoms based on its location at the proximal femur, though local pain, swelling and an enlargement of soft-tissue mass may herald osteochondroma. The most common causes of pain are bursa formation, impingement, fracture of the stalk, and malignant degeneration [12-14].

Harrington, et al reported a case of false aneurysm of the femoral artery which was associated with a solitary osteochondroma of the femur in a 22-year-old man [15]. The aneurysm was apparently unique because it could not be diagnosed with the aid of computed tomography and angiography.

Smits, et al warned that an exostosis on the course of the femoral artery requires additional examination either by the use of duplex ultrasonography or magnetic resonance arteriography in order to exclude an arterial disorder and if arterial compression by an exostosis is shown then an operative procedure to remove the exostosis should be performed [16]. In as much as this is true, our case when alive would not have been in danger since the osteochondroma was off the course of the femoral artery.

Tanigawa et al were of the view that osteochondroma developing around the knee, the distal femur and the proximal tibia are usually asymptomatic, but can occasionally impinge on the surrounding vessels and cause various clinical manifestations [17]. They reported a case of multiple hereditary exostoses in which the osteochondroma located in the distal portion of the femur fractured as a result of an injury from a traffic accident. It then migrated and cause compression of the femoral artery which led to an acute onset of lower extremity ischaemia.

Femoral anteversion, valgus, impairment of hip flexion acetabular dysplasia resulting in subluxation of the hip, valgus deformity of the knees and angular limb deformities are some of the defect commonly associated with osteochondromas affecting the proximal femur [18].

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References

1. D'Ambrosia R, Ferguson AB Jr. (1968). *The formation of osteochondroma by epiphyseal cartilage transplantation*: Clin Orthop. 61:103-15.
2. Rains HA and Mann CV (1990) *Tumours of bones and joints;* in Bailey and love's short practice of surgery 20th edition, HK Lewis pp 372-379.
3. Müller E. Uber (1914). *Hereditare multiple cartilaginare exostosen und exchondrosen. Beitr* Pathol Anat. ;57:232.
4. Mansoor A, Beals RK. (2007) *Multiple exostosis: a short study of abnormalities near the growth plate*. J Pediatr Orthop B. Vol. 16(5):363-5.
5. Porter DE, Simpson AH (1999) *The neoplastic pathogenesis of solitary and multiple osteochondromas.* J Pathol. Vol ;188(2):119-25.
6. Nogier A, De Pinieux G, Hottya G, Anract P (2006). *Case reports: enlargement of a calcaneal osteochondroma after skeletal maturity.* Clin Orthop Relat Res; 447:260-6. [
7. Garrison RC, Unni KK, McLeod RA, Pritchard DJ, Dahlin DC.(1982) *Chondrosarcoma arising in osteochondroma.* Cancer ;49(9):1890-7.
8. Staals EL, Bacchini P, Mercuri M, Bertoni F (2007). *Dedifferentiated chondrosarcomas arising in preexisting osteochondromas.* J Bone Joint Surg Am; 89(5):987-93.

9. Williams PL, Warwick R, and Dyson M. (1989). Osteology: In Gray Anatomy. 37th Ed. Churchill Living Stone. Edinburg, London. Pp 264-327.
10. Matsumoto Y, Matsuda S, Matono K, et al.(2007) *Intra-articular osteochondroma of the knee joint in a patient with hereditary multiple osteochondromatosis*. Fukuoka Igaku Zasshi. Vol;98(12):425-30.
11. Florez B, Mцnckeberg J, Castillo G, et al (2008). *Solitary osteochondroma long-term follow-up*. J Pediatr Orthop B. Vol;17(2):91-4.
12. Karasick D, Schweitzer ME, Eschelman DJ. (1997) *Symptomatic osteochondromas: imaging features*. AJR Am J Roentgenol;168(6):1507-12.
13. Murphey MD, Choi JJ, Kransdorf MJ, Flemming DJ, Gannon FH. (2000) *Imaging of osteochondroma: variants and complications with radiologic-pathologic correlation.* Radiographics; 20(5):1407-34.
14. El-Khoury GY, Bassett GS (1979). *Symptomatic bursa formation with osteochondromas.* AJR Am J Roentgenol. 133(5):895-8.
15. Harrington, V Campbell, R Valazques, T Williams (1991). *Pseudoaneurysm of the popliteal artery as a complication of an osteochondroma. A review of the literature and a case report.* Clinical orthopaedics and related research. Vol. 270:283-7
16. Smits AB, Pavoordt HD, Moll FL (1998). *Unusual arterial complications caused by an osteochondroma of the femur or tibia in young patients*. Annals of vascular surgery. Vol;12(4):370-2
17. Tanigawa N, Kariya S, Kojima H, Komemushi A, Fujii H, Sawada S.(2007) *Lower limb ischaemia caused by fractured osteochondroma of the femur*. The British journal of radiology. Vol;80(952):e78-80
18. Ali NK, Al-Salman MJ (2008) *Osteochondroma and Osteochondromatosis.* eMedicine Specialties<Orthopedic surgery. On line article