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Case Report

Case Based "*Aunt Minnie Approach in Orthopaedic Medical Education*" Exemplified by Diagnosis and Management of Distal Femoral Exostosis in a Child

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Abstract

Aunt Minnie approach in orthopaedic medical education is designed to promote rapid pattern recognition amongst learners in ambulatory setting. This approach was explained by analogy that if you know well your aunt Minnie, one will be able to identify her in a crowd by her appearance and dress without looking at her face [1].

Osteochondromas are the most common benign bone tumors occurring near the end of long bones. In this case report, we demonstrate the successful treatment of a patient with solitary benign osteochondroma of the distal femur. Today's teaching in medicine is plagued with time constraints. This methodology of teaching perhaps can be adopted by teacher in certain diagnostic conditions and can thus provide powerful learning experiences for lifelong.

This approach is exemplified here with the presentation of a case of a 17-year-old male with a painless bony swelling over the left lower thigh of 6 years duration. Radiographs of the left knee joint with femur revealed a large cauliflower like pedunculated bony mass from the anteromedial aspect of the left lower end of the femur, projecting away from the epiphysis. CE-MRI (contrast enhanced magnetic resonance imaging) of the left thigh and knee revealed pedunculated osseous lesion arising from the proximal metaphysis of distal femur projecting away from the metaphysic, which is consistent with osteochondroma of left distal femur. After clinical and radiological diagnosis, it was decided to treat the patient with surgical excision through an anteromedial approach. Histopathological report showed features consistent with osteochondroma.

Keywords: Osteochondroma; Exostosis; Distal Femur; Aunt Minnie Approach; Medical Education

Introduction

Osteochondroma is the most common primary bone tumor comprising more than onethird of all benign bone tumors [2]. They are developmental malformations rather than true neoplasms and are thought to originate within the periosteum [3]. Osteochondroma takes the form of a cartilage-capped bony outgrowth on the surface of the bone and are commonly present during the period of rapid skeletal growth and they cease to grow once maturity is reached [4]. They usually present as a painless mass and may be as an incidental finding in plain radiographs, but they can become painful if they impinges on nearby tissues or joints [5]. They can be classified as solitary or multiple. Solitary osteochondroma involves a single bone and is not hereditary. Whereas multiple osteochondromas develops either spontaneously or in an Autosomal Dominant pattern described as hereditary multiple exostosis [6]. Aunt minnie approach entails to the fact that the diagnosis of osteochondroma can generally be made immediately by their classical appearance of sessile or pedunculated lesion maintaining continuity with medullary space with associated other aspects of presentation.

Case Presentation

Here, we report a case of a 17-year-old male patient with solitary benign osteochondroma of the distal femur presenting with painless swelling over lower thigh for last 6 years duration which was small in size initially and increased to the current size of around 12 x 10 cm. There is no associated pain or limitation in movements. There is no associated history of fever or skin changes. Patient had

no history of any treatment for the swelling or similar bony swellings in other areas of the body.

On clinical Examination there was a painless oval bony mass arising from the anteromedial aspect of the lower end of left femur. On inspection, the skin overlying the mass was stretched but was intact and no overlying skin changes was present. On palpation, there was no local rise in temperature and the margins were indistinct. The mass per se was painless with an irregular surface and bony hard in consistency arising from the bone and immobile. The knee joint lines could be palpated indicating a swelling arising from the lower metaphyseal area of the femur. Clinically the size of the mass was approximately12 x 10 cm and there was no features suggestive of neurovascular compression. Range of movements at the left knee was painless and clinical test for ligaments and menisci around the knee were normal.

Such findings in clinical examination are literally consistent with almost confirmatory diagnosis of osteochondroma.

Routine blood investigations were within normal values. X rays of the left knee joint with femur (Figure 1,2) revealed a large pedunculated bony mass from the anteromedial aspect of the left lower end of the femur, projecting away from the epiphysis. The medulary canal found continuous with that of femur with a fluffy cartilage cap. This factually exemplifies the aunt Minnie approach in using radiological evaluation as the modality to almost make a definitive diagnosis of osteochondroma without necessarily keeping the differential diagnoses in such a presentation for teaching medical students of Orthopaedics.

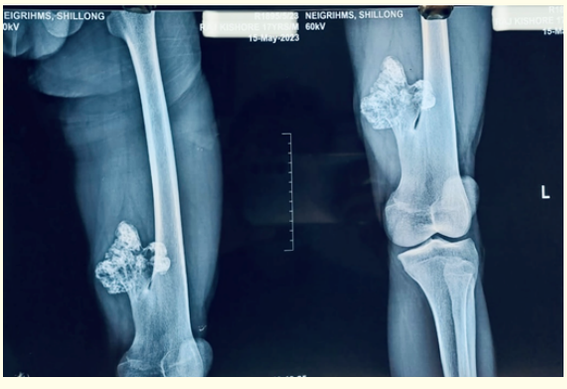


Figure 1

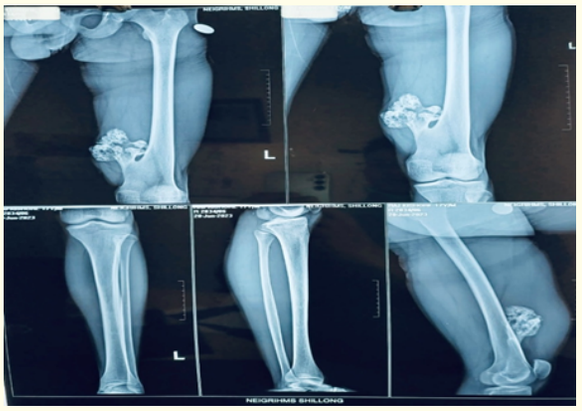
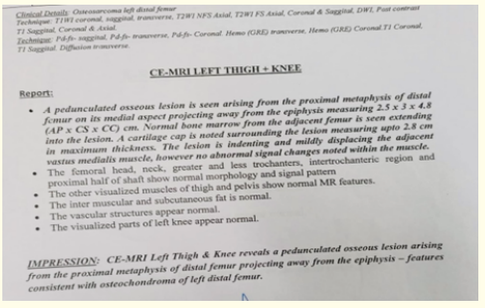


Figure 2

CE-MRI of the left thigh and knee (Figure 3) revealed pedunculated osseous lesion arising from the proximal metaphysis of distal femur projecting away from the metaphysic consistent with the diagnosis of osteochondroma of left distal femur. Osseous leasion was measuring 2.5 x 3 x 4.8 (AP x CS x CC) cm and the Cartilage cap was measuring upto 2.8 cm in maximum thickness.



Clinical Details: Osteosarcoma left distal femur
Technique: T1WI coronal, saggital, transverse, T2WI NFS Axial, T2WI FS Axial, Coronal & Saggital, DWI, Post contrast T1 Saggital, Coronal & Axial.
Technique: Pd-fs- saggital, Pd-fs- transverse, Pd-fs- Coronal. Hemo (GRE) transverse, Hemo (GRE) Coronal.T1 Coronal, T1 Saggital. Diffusion transverse.

CE-MRI LEFT THIGH + KNEE

Report:

- *A pedunculated osseous lesion is seen arising from the proximal metaphysis of distal femur on its medial aspect projecting away from the epiphysis measuring 2.5 x 3 x 4.8 (AP x CS x CC) cm. Normal bone marrow from the adjacent femur is seen extending into the lesion. A cartilage cap is noted surrounding the lesion measuring upto 2.8 cm in maximum thickness. The lesion is indenting and mildly displacing the adjacent vastus medialis muscle, however no abnormal signal changes noted within the muscle.*
- The femoral head, neck, greater and less trochanters, intertrochanteric region and proximal half of shaft show normal morphology and signal pattern
- The other visualized muscles of thigh and pelvis show normal MR features.
- The inter muscular and subcutaneous fat is normal.
- The vascular structures appear normal.
- The visualized parts of left knee appear normal.

IMPRESSION: *CE-MRI Left Thigh & Knee reveals a pedunculated osseous lesion arising from the proximal metaphysis of distal femur projecting away from the epiphysis – features consistent with osteochondroma of left distal femur.*

Figure 3

After clinical and radiological diagnosis, it was decided to treat the patient with surgical excision and subject the specimen for histopathological evaluation to confirm the diagnosis. The patient was operated under spinal anaesthesia with all aseptic precautions, the lesion was approached through an anteromedial approach. The vastus medialis was dissected bluntly and the bony mass with the cartilage cap was identified (Intra-operative pictures: 1, 2). Intra operative flouroscopic images were taken to delineate the excision landmarks (Intra-operative pictures: 3, 4). The lesion was excised with a cuff of normal periosteum flushed with normal bone. The tumor measured around 10 cm x 7cm x 5cm (Intra-operative pictures: 5, 6, 7)

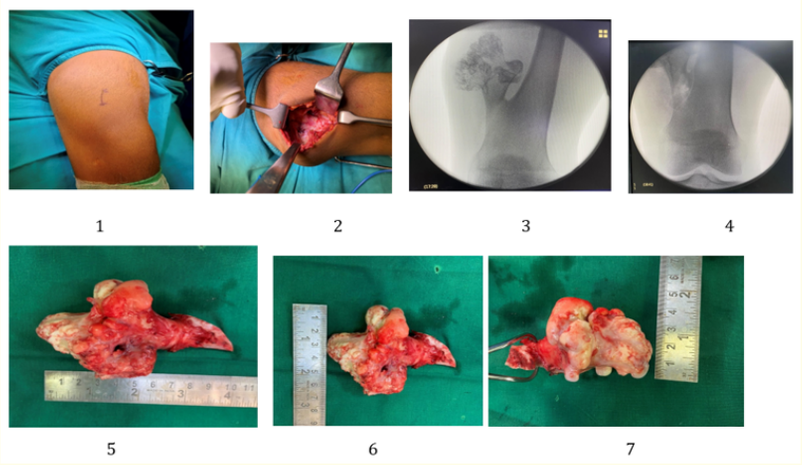


Figure a: Intra-operative pictures.

Post operative X rays revealed complete excision of the tumor (Post op picture: 1) and histopathology report confirmed the diagnosis of osteochondroma of left distal femur (Figure 4).

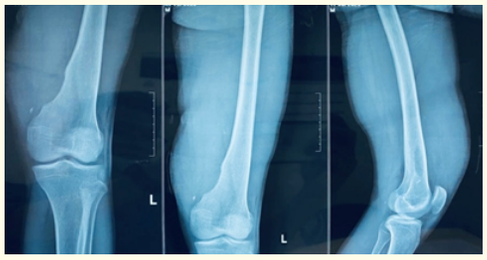


Figure b: Post-operative picture.

The patient had an uneventful post operative period with histopathology confirming the diagnosis of osteochondroma with no features suggestive of malignancy.

Nature of specimen:	Date of receipt :	Date of dispatch:
Excised exostosis (osteochondroma from distal left femur with ? cartilaginous capsule over the exostosis / soft tissue	3/07/2023	15/07/2023
Clinical details: Osteochondroma		

Gross: Received a bony tissue and 2 soft tissues altogether weighing 101.4gm. Largest bony tissue measures (10x.2x6.5x5)cm. The bony tissue shows a cauliflower protrusion like growth from one end with some of the protrusion covered by grey white shiny cartilaginous areas. Cut surface shows focal areas lined by a cartilaginous cap. Rest of the areas are unremarkable. The larger soft tissue measures (10.5x4x2)cm. Smaller soft tissues measures (2.5x1.5x1)cm.

Micro: Multiple decal sections studied from specimen labelled as "Excised exostosis (osteochondroma from distal left femur) " show features consistent with osteochondroma,

Figure 4

Discussion

Osteochondroma being the most common benign bone tumor encountered, can develop in any bone that is cartilage-covered. Metaphyseal end of long bones like femur, tibia and humerus are its principle location, which accounts for around 36-41% of all benign bone tumors. The common predilection of osteochondromas is around the knee (50%), in which the distal femur is the most common site [7].

In the study by Alyas., *et al*, it was described that osteochondroma remains mainly asymptomatic and is usually diagnosed incidentally on radiographs which were obtained for other reasons [8]. Motamedi., *et al*. mentioned that the second most frequent appearance of osteochondroma is a painless palpable lump on the involved bone [9], which is a manifestation found in our case, where the patient presented with a lump on the anteromedial aspect of the left thigh. The differential diagnoses of osteochondroma may include synovial chondromatosis, osteochondroma, large osteophyte, and pigmented villonodular synovitis.

The treatment of osteochondroma of distal femur involves simple removal; however, Boya., *et al.* stressed the need for extra-periosteal full resection of the cartilaginous cap to prevent a recurrence [10]. Surgical excision provides relief of pain and deformity and improves range of motion if restricted. Early preventive resection of the tumor is necessary to avoid the risk of malignant transformation of the mass into chondrosarcoma.

Conclusion

Osteochondroma most frequently occurs in the long bones such as the tibia, femur, and humerus which can present as a cosmetic deformity and symptoms produced by mechanical compression of surrounding structures. A sudden increase in the size of the tumor with along pain should raise a suspicion of a malignant transformation. Follow up for such cases, following surgical intervention ideally requires a minimum of 12 - 36 months.

Finally, by following the Aunt Minnie approach one should be able to make aspot diagnosis of a case of osteochondroma based on its clinical and radiology appearance and should not miss the diagnosis and that it may be mentioned here that virtually it has no differential diagnosis to consider which would otherwise affect subsequent patient management.

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Conflict of Interest

None.

Bibliography

1. Irby DM and Wilkerson L. "Teaching when time is limited". *BMJ* 336.7640 (2008): 384-387.

2. Singh R., *et al*. "Large paraarticular osteochondroma of the knee joint: A case report". *Acta Orthopaedica et Traumatologica Turcica* 46 (2012): 139143.

3. Oljaca A., *et al*. "Osteochondroma of the scapula associated with a subclavian artery pseudoaneurysm: Case report". *SAGE Open Medical Case Reports* 7 (2019): 2050313X18823089.

4. Heck KR Jr. "Benign bone tumors and neoplastic conditions simulating bone tumors. In: Canale ST, Beaty JH, editors. Campbell's Operative Orthopaedic s. 11th edition. Philadelphia, PA: Mobsy Elsevier (2007): 858-861.

5. Ercin E., *et al*. "Talar osteochondroma fracture presenting as posterior ankle impingement". *Journal of the American Podiatric Medical Association* 106.3 (2016): 225-228.

6. Obalum DC., *et al*. "Pattern of osteochondromas in Lagos, Nigeria". *Nigerian Quarterly Journal of Hospital Medicine* 18 (2008): 69-71.

7. Passanise AM., *et al*. "Radiographic Evidence of Regression of a Solitary Osteochondroma". *Journal of Pediatric Orthopaedics* 31.3 (2011): 312-316.

8. Alyas F., *et al*. "The role of MR imaging in the diagnostic characterisation of appendicular bone tumours and tumour-like conditions". *European Radiology* 17.10 (2007): 2675-2686.

9. Motamedi K and Seeger LL. "Benign Bone Tumors". *Radiologic Clinics of North America* 49.6 (2011): 1115-1134.

10. Boya H., *et al*. "Osteochondroma of the talus: an unusual location". *Acta Orthopaedica et Traumatologica Turcica* 48.2 (2014): 236-239.