

Osteoid Osteoma of the Fifth Metatarsal Bone

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A twelve-year-old male with 6-week history of atraumatic pain in the lateral aspect of his right forefoot not responding to conservative treatment were seen in the orthopedic clinic. The pain was worse at night and relieved with non-steroidal anti-inflammatory drugs. Plain radiographs and MRI revealed features of osteoid osteoma of the right fifth metatarsal bone. The osteoid osteoma was removed by curettage, which gave the patient a complete relief of his presenting symptoms. This case demonstrates the rare anatomic position of osteoid osteoma.

Bahrain Med Bull 2009; 31(3):

Osteoid osteoma is a benign skeletal neoplasm of unknown etiology. It is composed of osteoid and woven bone. This tumor consists of a centrally located vascularized nidus, typically surrounded by a variable amount of sclerotic reaction. The nidus is usually 1-10 mm in diameter¹. It is a common bone tumor, comprising approximately 10-12% of benign bone tumors². Although any bone of the skeleton can be involved, approximately 50% of all osteoid osteomas occur in the femur and tibia². In the foot, it accounts for approximately 4% of cases³. The commonest site in the foot is the talus⁴⁻⁶.

The classic presentation of osteoid osteoma is a focal bone pain, which worsens at night and increases with activity. The level of prostaglandin E₂ is markedly elevated in the nidus; this is presumably the cause of pain and vasodilatation, and it is the reason for the pain being relieved dramatically with small doses of aspirin⁷.

On plain radiographs, the lesion appears as a small sclerotic bone island with a circular lucent defect. CT scan is used for precise localization of the nidus and may be used for guiding percutaneous ablation⁸⁻¹⁰. There is no need for MRI for osteoid osteoma if CT scan is available. Radionuclide scanning is a sensitive technique, and the findings may be positive before radiographic changes are apparent^{11,12}.

Osteoid osteoma is traditionally treated by Curettage or by En bloc resection. Complete surgical excision of the nidus is required. Reactive sclerosis subsequently resolves spontaneously¹³. Recently, many osteoid osteomas have been treated by percutaneous radiofrequency ablation¹⁴⁻¹⁷.

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Follow-up care is essential to ensure successful removal and to observe the patient for rare recurrences.

The aim of this report is to present a rare case of osteoid osteoma of the fifth metatarsal presented with chronic pain. To our knowledge, this is the first case to be reported in the Gulf countries.

THE CASE

A twelve-year-old boy presented with six-week history of pain and swelling over the lateral aspect of the right forefoot. There was no history of trauma. The pain was relieved by non-steroidal anti-inflammatory drugs. On examination, there was mildly tender swelling over the distal end of the right fifth metatarsal bone.

Imaging evaluation including X-ray and MRI were obtained. X-ray showed a lytic area in the neck of the right fifth metatarsal bone surrounded by a thin rim of sclerosis with widening of the whole metatarsal bone, see Figure 1. MRI showed a round focus of low signal intensity nidus in the neck of the right fifth metatarsal bone surrounded by bone marrow and soft-tissue edema, see Figure 2. Imaging findings were consistent with osteoid osteoma. Surgery was done under general anesthesia through 3 cm long lateral longitudinal incision over the distal end of the right fifth metatarsal bone, a window in the bone overlying the tumor was created and a thorough curettage of the tumor nidus and the surrounding bone was performed. Histopathological examination confirmed the diagnosis of osteoid osteoma.



Figure 1 (a)



Figure 1 (b)

Figure 1 (a, b): X-rays Showing a Lytic Lesion of the Neck of the Right Fifth Metatarsal Bone Surrounded by a Thin Rim of Sclerosis and Widening of the Whole Bone, a) AP View, b) Oblique View



Figure 2 (a)

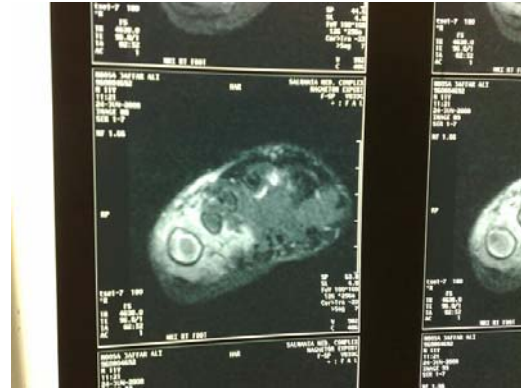


Figure 2 (b)



Figure 2 (c)



Figure 2 (d)

Figure 2 (a-d): MRI Images Showing the Lucent Bony Lesion in the Neck of the Right Fifth Metatarsal Bone Surrounded by Bone Marrow and Soft Tissue Edema

Following surgery, the patient was followed up in the clinic twice, after 3 months and after 10 months. The patient had complete relief of his symptoms and X-rays showed complete resolution of the tumor, see Figure 3.



Figure 3 (a): AP

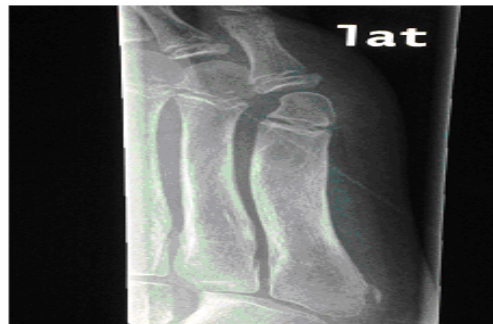


Figure 3 (b): Lat



Figure 3 (c): AP



Figure 3 (d): Lat

Figure 3 (a-d): X-rays Taken 3 Months (a, b) and 10 Months (c, d) after Surgery

DISCUSSION

In the long tubular bones, the osteoid osteoma nidus is typically located in the diaphyseal cortex where it is surrounded by a fusiform cortical thickening, solid or laminated periosteal new bone formation. Cancellous osteoid osteoma has an intramedullary location. The most common sites affected by cancellous osteoid osteomas include the juxta-articular region of the femoral neck, the posterior elements of the spine, and the small bones of the hands and feet. Usually, little sclerosis occurs around the nidus.

Osteoid osteoma occurring in the foot is unusual and accounts for approximately 4% of cases³. The commonest bone involved in the foot is the talus⁴⁻⁶. Very rare cases were reported in the literature involving the metatarsal bones¹⁸.

The clinical presentation can be easily confusing if the site in question is rare and the presentation is atypical. Lesions occurring in the foot often pose particular problems in diagnosis, often leading to delay of treatment^{7,8}.

Although osteoid osteoma occurring in the foot is unusual, we believe it should be considered in the differential diagnosis of chronic foot or ankle pain^{19,20}, especially if such a symptom occurs in children and young adults with normal laboratory findings and no history of previous trauma.

CONCLUSION

A rare case of osteoid osteoma of the fifth metatarsal has been presented with a review of the literature. The case has been managed successfully with surgery. Follow up showed a complete relieve of symptoms and no signs of recurrence.

REFERENCES

1. Greenspan A. Benign Bone Forming Lesions: Osteoma, Osteoid Osteoma and Osteoblastoma, Clinical, Imaging, Pathologic, and Differential Considerations. *Skeletal Radiol* 1993; 22: 485-500.

2. Kransdorf MJ, Stull MA, Gilkey FW, et al. Osteoid Osteoma. *RadioGraphics* 1991; 11: 671-96.
3. Shereff MJ, Cullivan WT, Johnson KA. Osteoid-Osteoma of the Foot. *J Bone Joint Surg Am* 1983; 65: 638-41.
4. Capanna R, Van Horn JR, Ayala A, et al. Osteoid Osteoma and Osteoblastoma of the Talus: A Report of 40 Cases. *Skeletal Radiol* 1986; 15: 360-4.
5. Chuang SY, Wang SJ, Au MK, et al. Osteoid Osteoma in the Talar Neck: A Report of Two Cases. *Foot Ankle Int* 1998; 19: 44-7.
6. Snow SW, Sobel M, DiCarlo EF, et al. Chronic Ankle Pain Caused by Osteoid Osteoma of the Neck of the Talus. *Foot Ankle Int* 1997; 18: 98-101.
7. Kan P, Schmidt MH. Osteoid Osteoma and Osteoblastoma of the Spine. *Neurosurg Clin N Am* 2008; 19(1): 65-70.
8. Moser T, Giacomelli MC, Clavert JM, et al. Image-Guided Laser Ablation of Osteoid Osteoma in Pediatric Patients. *J Pediatr Orthop* 2008; 28(2): 265-70.
9. Murphy K, Baez JC, Cooney B, et al. CT Fluoroscopy-Guided Postmyelographic Transtheical Radiofrequency Ablation of a Posterior Vertebral Body Osteoid Osteoma. *J Vasc Interv Radiol* 2008; 19(2): 291-3.
10. Donkol RH, Al-Nammi A, Moghazi K. Efficacy of Percutaneous Radiofrequency Ablation of Osteoid Osteoma in Children. *Pediatr Radiol* 2008; 38(2): 180-5.
11. Davies AM, Wellings RM. Imaging of Bone Tumors. *Curr Opin Radiol* 1992; 4(6): 32-8.
12. Tumei SS. Scintigraphy in the Evaluation of Arthropathy. *Radiol Clin North Am* 1996; 34(2): 215-31, ix.
13. Rajasekaran S, Kamath V, Shetty AP. Intraoperative Iso-C Three-Dimensional Navigation in Excision of Spinal Osteoid Osteomas. *Spine* 2008; 33(1): E25-9.
14. Dupuy DE, Goldberg SN. Image-guided Radiofrequency Tumor Ablation: Challenges and Opportunities-Part II. *J Vasc Interv Radiol* 2001; 12(10): 1135-48.
15. Lindner NJ, Ozaki T, Roedl R, et al. Percutaneous Radiofrequency Ablation in Osteoid Osteoma. *J Bone Joint Surg Br* 2001; 83(3): 391-6.
16. Woertler K, Vestring T, Boettner F, et al. Osteoid Osteoma: CT-Guided Percutaneous Radiofrequency Ablation and Follow-up in 47 Patients. *J Vasc Interv Radiol* 2001; 12(6): 717-22.
17. Lee MH, Ahn JM, Chung HW, et al. Osteoid Osteoma Treated with Percutaneous Radiofrequency Ablation: MR Imaging Follow-up. *Eur J Radiol* 2007; 64(2): 309-14.
18. Patterson BT, Peters VJ. Osteoid Osteoma of the Fourth Metatarsal: A Case Report. *J Am Podiatry Assoc* 1981; 71(6): 328-30.
19. Khan JA, Vaidya S, Devkota P, et al. Subperiosteal Osteoid Osteoma of the Neck of Talus. *JNMA J Nepal Med Assoc* 2009; 48(173): 58-61.
20. Mommert I, Heuschmidt M, Suckel A. Intraarticular Osteoid Osteoma as a Cause of Chronic Ankle Pain. *Orthopade* 2009; 38(3): 269-73.