Case Report: Osteoid Osteoma of the Proximal Femur

Sergio Martinez D.O.,
Brian Cross D.O.

Abstract

Osteoid osteoma is a benign osteoblastic tumor, which can occur anywhere including metaphyseal regions of small and large bones. Typically it presents with pain, which is usually worse at night, and is relieved with anti-inflammatory medications. Osteoid osteomas are characterized by an osteoid rich nidus in a highly loose, vascular connective tissue. The nidus is well demarcated with variable amounts of calcification, and surrounded by sclerotic bone.

The surgical management of osteoid osteoma in structurally vital locations with pathologic fractures should include removal of the lesion, as well as prophylactic fixation. This approach helps maintain support of these high stress areas.

Introduction

Osteoid osteoma is the most commonly seen benign bone-forming lesion, accounting for 10% to 12% of all benign bone tumors and 3% of all primary bone tumors.1 This lesion commonly occurs in persons aged 5 to 25 years, with a male to female ratio of 2:1.2 In more than 50% of the cases, the lesion occurs in the metaphysis and diaphysis of long bones, especially the femur and tibia.2

Clinical symptoms of osteoid osteoma classically include the presence of local pain that is more frequent and severe at night and that is relieved with nonsteroidal anti-inflammatory drugs. Other signs and symptoms include local swelling and tenderness, bony deformity, past disturbances, and muscle atrophy.1

Plain radiograph is the initial examination of choice. Osteoid osteoma has a characteristic ovoid radiolucency representing the nidus as well as a surrounding area of reactive bone sclerosis with or without periosteal bone formation. CT is considered to be the imaging method of choice for visualizing the anatomic position of the nidus and aiding in the differential diagnosis.4 On this slice CT the lesion appears as a low-attenuation nidus with central mineralization and varying degrees of sclerosis surrounding the nidus.1

Nonsurgical management with salicylates or NSAIDs is a justifiable therapeutic option because these drugs can effectively relieve pain. However few published studies have evaluated the effects of prolonged medical management and reported complete resolution of symptoms with discontinuation of NSAIDs.2 Surgical treatment options include open excision of the lesion, CT-guided percutaneous excision, and CT-guided radiofrequency ablation. Surgical management is warranted in cases in which the pain is severe and unresponsive to medication, or for patients who are unwilling to accept potential gastrointestinal complications associated with the use of NSAIDs. En bloc excision of the tumor, and cortical shaving and curettage of the nidus cavity, are frequently used conventional techniques with successful outcomes.2,5 CT-guided percutaneous excision uses a cannulated needle that is inserted into the lesion over a Kirschner wire under CT image guidance to excise the nidus. In CT-guided radiofrequency ablation, heat is applied locally to destroy the nidus.

Figure 1

Case presentation

This is a case of a nine-year-old male who presented to the Emergency Department complaining of right groin pain. The patient had started developing discomfort about two weeks prior to presentation. The day before presenting to the ED, the patient was tackled during football practice and subsequently developed increased pain. The patient was ambulating with a limp. The patient denied fever, chills, fatigue, changes in appetite, as well as pain in any other body parts. Examination revealed full range of motion of the right hip with groin discomfort on internal and external rotation, and mild tenderness to palpation. The rest of the exam was unremarkable. Plain radiographs of the right hip showed normal bone structures and a well-defined oval luency adjacent to the femoral neck (Figure 1). CT scan of the right hip also showed sclerotic changes involving the inferior medial portion of the femoral neck just proximal to the calcar with a 2 cm area of low attenuation. The CT also revealed a small lucent cavity representing a nondisplaced incomplete fracture within the aforementioned lesion (Figure 2). The patient was admitted by the pediatric service for further workup and was ultimately diagnosed with a benign bone tumor likely osteoid osteoma or osteoblastoma with incomplete pathologic fracture.

The patient was discharged home after a short stay with protected weight bearing of the right lower extremity. On follow-up from the hospital the patient's pain was managed with nonsteroidal anti-inflammatory medications, which did not entirely help relieve his pain. The lesion was followed with serial plain radiographs, and after a period of approximately seven months it was noted that the tumor had in fact grown in size and the fracture had not healed completely. After lengthy discussion with the patient's parents, it was decided to treat the lesion operatively.

Open excision of the lesion was elected so that direct visualization could be obtained and also to aid in the fixation of the femoral neck. Operative findings included a 1cm by 1cm by 2cm lesion in the inferior anteromedial aspect of the femoral neck at the superior portion of the calcar femorale. There was a large amount of reactive bone. There was no evidence of infection, extension of the tumor outside the cortical margins, or evidence of soft tissue involvement. An incomplete fracture of the femoral neck was noted at the superior portion of the lesion.

The first phase of the surgery involved placing the preparation of a Synthes 3.5mm pediatric locking hip plate that would be used as fixation of the pathologic fracture. This part of the procedure was done through a direct lateral approach to the proximal femur. The second phase of the surgery involved excision of the tumor through a Smith-Petersen interval in the anterior aspect of the hip. Using a curette, the marginal excision of the entire lesion was performed and confirmed under direct visualization. The lesion in the femoral neck was then filled with bone graft. Finally attention was turned back to the lateral exposure and 3.5mm locking screws were placed through the plate into the center of the femoral neck. Postoperative plain radiographs are demonstrated in figure 3. Postoperatively the patient was instructed to be toe-touch weight bearing for approximately 6 weeks and then slowly advanced.

Figure 2

Conclusion

Osteoid osteoma is a benign bone-producing tumor that classically presents with local pain that is more frequent and severe at night and that is relieved with nonsteroidal anti-inflammatory drugs. Nonsurgical management with NSAIDs is an option for treatment of this tumor. Surgical management is considered when nonsurgical methods fail or are not feasible for or desirable by the patient.

In the case presented here the patient had also sustained a pathologic fracture. The decision to treat the lesion with open excision was dictated by the need to fix the fracture. Open reduction internal fixation of the fracture justified open excision and curettage as well as filling the lesion with bone graft.

The case presented is a good example of how surgical management of osteoid osteoma in structurally vital locations with pathologic fractures should include removal of the lesion, as well as prophylactic fixation. This approach helps maintain support of these high stress areas.

Figure 3

References
