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Case Report

Hip preservation in crisis: total hip replacement for osteoid osteoma-induced degeneration in a young adult

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ABSTRACT

Osteoid osteoma is a small, benign tumor known for causing severe pain, especially at night. Intra-articular osteoid osteomas are rare and often misdiagnosed due to overlapping symptoms with other joint disorders like osteoarthritis or synovitis. These tumors require advanced imaging for accurate diagnosis and may necessitate surgical intervention when conservative treatments fail. A 22-year-old female presented with a four-year history of left hip and loin pain, initially treated with NSAIDs. Her symptoms progressively worsened, leading to imaging studies that revealed a sclerotic lesion in the hip joint. A biopsy confirmed osteoid osteoma, and due to the extent of joint damage, total hip replacement (THR) was performed. Postoperative recovery was excellent, with full functional restoration and no complications. This case illustrates the diagnostic and therapeutic challenges of intra-articular osteoid osteomas. THR proved to be a successful treatment in restoring function and alleviating pain, underscoring the need for early diagnosis and individualized surgical management in advanced cases.

Keywords: Osteoid osteoma, THR, Bone lesion, Tumour

INTRODUCTION

Osteoid osteoma is a benign but painful bone tumor, typically small in size, yet notorious for causing disproportionate discomfort. Most commonly seen in young adults, this tumor generally affects long bones like the femur or tibia. However, its intra-articular occurrence, particularly in the hip joint, poses significant diagnostic challenges. The hip, a ball-and-socket joint, is especially vulnerable when the osteoid osteoma invades critical regions such as the acetabulum or femoral neck. In these cases, the tumor's proximity to the joint capsule frequently leads to misleading symptoms that mimic more prevalent conditions, such as synovitis, osteoarthritis, or labral tears, often delaying accurate diagnosis.[1,3]

Intra-articular osteoid osteomas are distinguished by their joint-specific clinical presentation. Patients typically experience persistent, activity-related pain, coupled with stiffness, which becomes markedly worse at night. A key feature of this tumor is its responsiveness to nonsteroidal anti-inflammatory drugs (NSAIDs), owing to the elevated prostaglandin levels associated with its pathophysiology.[2,4] While conservative treatments such as NSAIDs provide symptomatic relief, definitive management often requires surgical intervention. Minimally invasive techniques like radiofrequency ablation (RFA) or arthroscopic excision are preferred for smaller lesions. However, in more advanced cases where the tumor induces severe joint degeneration, more invasive measures such as THR may become necessary.[5,6]

This case report presents a rare occurrence of an intra-articular osteoid osteoma originating from the pubic bone and extending into the hip joint, resulting in significant joint degeneration and secondary osteoarthritis. Notably, there are no previous reports documenting tumor resection followed by THR as the initial treatment option for a young adult with osteoarthritis secondary to osteoid osteoma of the hip. In this case, surgical management, including THR, was critical to restore joint function and improve the patient's quality of life. This case underscores the importance of including osteoid osteoma in the differential diagnosis of persistent hip pain and highlights the complexity of managing such lesions when conservative measures prove insufficient.[1,2,5,7]

CASE REPORT

A 22-year-old female college student from a rural area presented to our clinic with a four-year history of intermittent left hip and loin pain. The pain, initially mild, had progressively worsened over time, significantly impacting her quality of life. Her condition was initially managed conservatively by a general practitioner, but as her symptoms intensified and she developed a noticeable limp, she was referred to us for further evaluation. At presentation, she reported severe, disabling hip pain that interfered with her daily activities. She denied any constitutional symptoms such as fever, weight loss, general malaise, or recent trauma. On examination, she exhibited a pronounced Trendelenburg gait, a 2 cm leg length discrepancy with shortening on the left side, a 25-degree adduction deformity, a 10-degree flexion deformity, and quadriceps muscle weakness. Her initial Harris Hip Score was a mere 40, reflecting severely compromised hip function. Routine laboratory investigations, including biochemical analyses of blood and urine, revealed no significant abnormalities.

Advanced imaging modalities, including X-ray, MRI, and CT scans, were performed, which revealed an expansile, predominantly sclerotic lesion involving the left pubis and ischium, extending to the articular surface of the hip joint. The lesion displayed a wide zone of transition, characteristic of an aggressive process, with irregularity and distortion of the femoral head contour (Figure 1). Despite the concerning appearance, no pathological fractures were detected. The differential diagnosis included osteoid osteoma, osteochondroma, and a potential malignant process such as osteosarcoma. To confirm the diagnosis, a Tru-cut biopsy was performed, which histologically revealed a benign bone-forming lesion consistent with osteoid osteoma. Given the patient's significant clinical symptoms, and the lesion's local aggressiveness, we recommended proceeding with a definitive surgical intervention-tumor resection (symptomatic joint area) and THR.

Surgery was conducted through a posterior approach, carefully utilizing the previous biopsy scar (Figure 2). Intraoperative findings were striking, with the tumor aggressively encroaching upon the roof of the acetabulum and causing extensive degenerative changes in the femoral head. The femoral head was excised, sent for biopsy and acetabular reaming was undertaken, although it proved challenging due to the extensive sclerosis of the acetabulum. Despite these difficulties, an uncemented femoral stem and a cementless acetabular cup (Depuy Synthes Corail stem and Durolac cup) were successfully implanted. Postoperatively, the patient's recovery was smooth, and she was mobilized the following day with the aid of a walking frame. Biopsy reports confirmed osteoid osteoma (Figure 3).

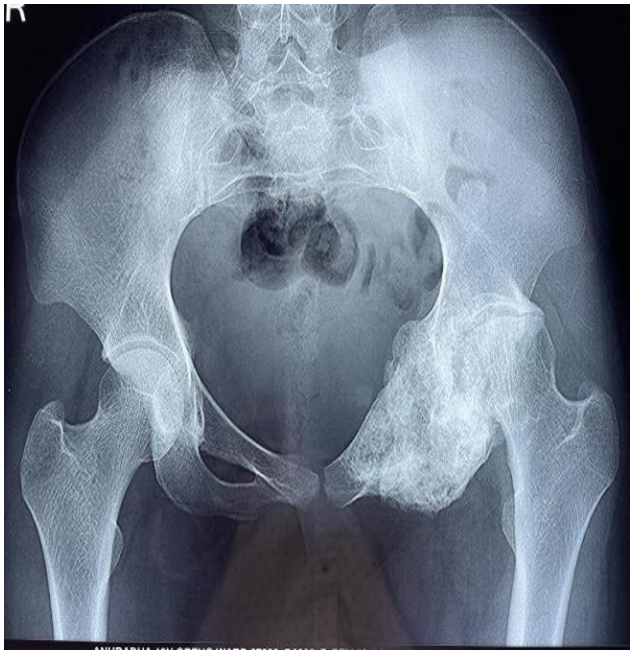

Figure 1: X-ray displaying a lytic lesion extending from the pubic bone to the left hip joint, highlighting the extent of the pathological involvement.

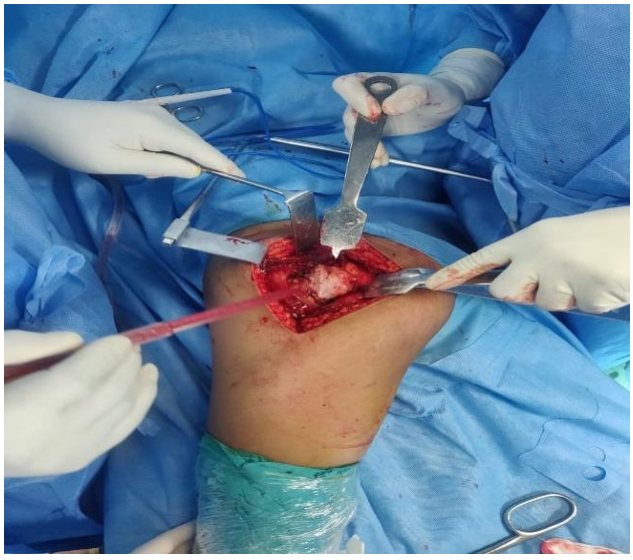

Figure 2: Intraoperative view of the hip, illustrating the posterior approach to access the femoral head.

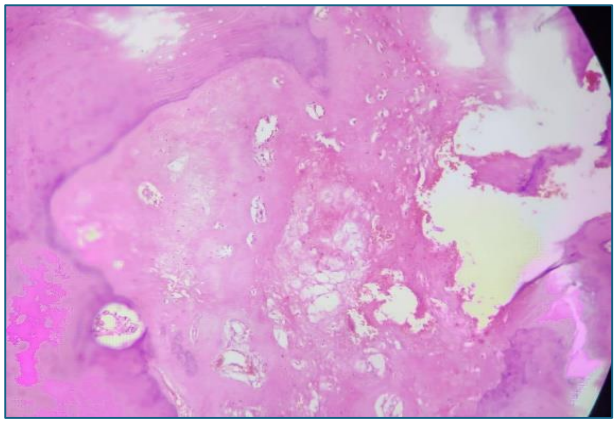

Figure 3: Hematoxylin and eosin (H and E) staining revealed woven bone characterized by interlacing bundles of osteoid, rimmed by osteoblasts with normal morphology.

At the three-month follow-up, the patient's remarkable recovery was evident, but her progress continued to be closely monitored. She had regained complete autonomy in her activities of daily living, reflecting the functional success of the procedure. Her gait had normalized, and she exhibited no signs of limping or instability. The comprehensive radiological assessments, including follow-up X-rays and MRI scans, confirmed the integrity of the prosthetic components, with no signs of loosening, osteolysis, or any other complications (Figure 4). Joint's architecture had been successfully reconstructed, and cementless implants demonstrated excellent integration with surrounding bone. Her Harris hip score, which had risen to 98, reflected not only the absence of pain but also restoration of full hip functionality, allowing her to resume her academic pursuits and daily activities without restriction. Given her favorable response to surgery and absence of any adverse postoperative events, she was advised to continue with routine follow-ups to ensure long-term stability and monitor for any late complications. Overall outcome of this case highlights the efficacy of timely surgical intervention and the pivotal role of THR in managing complex bone lesions like osteoid osteoma that threaten joint function and patient quality of life.

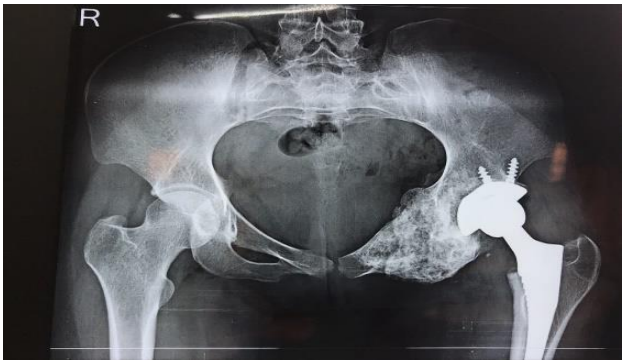

Figure 4: Postoperative radiograph of the pelvis and both hips at three months post-surgery, demonstrating stable implant positioning.

DISCUSSION

This case report presents the successful management of a 22-year-old female with an aggressive intra-articular osteoid osteoma, extending from the pubic bone to the hip, treated with THR. The complexity of intra-articular osteoid osteomas, particularly when involving major joints like the hip, presents significant diagnostic and therapeutic challenges, necessitating a multidisciplinary approach for precise and effective management.

Intra-articular osteoid osteomas represent approximately 10% of all osteoid osteomas and are most frequently localized in joints such as the hip, elbow, and ankle.[8] Due to their rare intra-articular involvement and the often subtle, non-specific clinical manifestations, including pain, stiffness, and monoarthritis, diagnosis is frequently delayed or misinterpreted. These symptoms can closely mimic a spectrum of more common conditions, such as aseptic osteonecrosis, synovitis, stress fractures, or pigmented villonodular synovitis, thus complicating the diagnostic process.[9] This overlap of clinical features often leads to a delay in proper identification, with the time from symptom onset to diagnosis extending between 1.5 to 3.5 years in many cases.[10]

Imaging techniques are indispensable in the precise identification and confirmation of osteoid osteoma. Computed tomography (CT) remains the gold standard for detecting the characteristic nidus and surrounding sclerosis, especially in atypical intra-articular cases. CT offers high-resolution imaging with millimetric slices, enabling precise localization of the lesion and providing a detailed view of its relationship to adjacent structures-an essential factor in pre-surgical planning.[11] While magnetic resonance imaging (MRI) may help in visualizing secondary signs such as joint inflammation or effusion, it generally falls short in reliably identifying the nidus itself.[12]

In this particular case, THR was selected due to the extensive involvement of the pubic bone and the severe joint degeneration that had already progressed to secondary osteoarthritis. Although alternative modalities, such as RFA, arthroscopic excision, and nidus removal, were considered, the complex nature and extensive spread of the lesion rendered THR the most appropriate option. Nidus removal, despite its efficacy in smaller and less aggressive cases, may not be suitable in scenarios where there is significant joint involvement or advanced degeneration.[13] Arthroscopy, while minimally invasive, is generally reserved for smaller, confined lesions that are limited to the joint space.[14] RFA, although effective in treating localized extra-articular osteoid osteomas, may not offer sufficient efficacy in cases with extensive joint damage or large lesions.[15]

This case underscores the necessity of considering osteoid osteoma as part of the differential diagnosis in young adults presenting with persistent joint pain. It further

emphasizes the critical role of advanced imaging techniques, such as CT and MRI, in guiding both diagnosis and subsequent treatment decisions. Further research is warranted to refine diagnostic criteria and explore less invasive therapeutic options for cases involving extensive joint damage.[16]

CONCLUSION

The successful outcome following THR in this case underscores the critical role of personalized treatment strategies for managing complex intra-articular osteoid osteomas. When conservative treatments prove insufficient, or when the lesion results in significant joint degeneration, more advanced surgical options—such as THR-become essential to restore function and alleviate pain. This case highlights the importance of early recognition and a tailored, multidisciplinary approach to optimize patient outcomes in such challenging cases. Ultimately, individualized care that leverages both advanced imaging and surgical precision remains pivotal in achieving long-term success for patients with severe intra-articular hip tumours.

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REFERENCES

1. Rosenthal DI, Francis JH, Martin T, Mark CG, Henry JM. Osteoid osteoma: Percutaneous treatment with radiofrequency energy. Radiology. 1995;229(1):171-5.
2. Ozaki T, et al. Intra-articular osteoid osteoma in the hip joint: Diagnostic and therapeutic difficulties. Skeletal Radiol. 2002.
3. Pettine KA, et al. Osteoid osteoma of the hip simulating an acute injury. A case report. J Bone Joint Surg Am. 1982.
4. Greenspan A. Benign bone-forming lesions: Osteoma, osteoid osteoma, and osteoblastoma: clinical, imaging, pathologic, and differential considerations. Skeletal Radiol. 1993;22(7):485-500.
5. Cantwell CP, Kenny P, Eustace S. Low radiation dose CT technique for guidance of radiofrequency ablation of osteoid osteoma. Radiographics. 2008;63(4):449-52.
6. Gibbs CP, et al. The management of osteoid osteoma: Percutaneous radiofrequency ablation versus surgical resection. J Bone Joint Surg Br. 2005.
7. Assoun J, Richardi G, Railhac JJ, Baunin C, Fajadet P, Giron J, et al. Osteoid osteoma: MR imaging versus CT. Radiology. 1994;191(1):217-23.
8. Norman A, Dorfman HD. Osteoid osteoma: Diagnostic and therapeutic problems. Radiology. 1975;110:233-8.
9. Jaffe HL. Osteoid osteoma: A benign osteoblastic tumor composed of osteoid and atypical bone. Arch Surg. 1935;31:709-28.
10. Parvizi J, et al. Diagnosis and management of osteoid osteoma: The role of CT imaging. J Bone Joint Surg Am. 2007.
11. Gangi A, Dietemann JL, Gasser B, Mortazavi R, Brunner P, Mourou MY, et al. Interstitial laser photocoagulation of osteoid osteomas with use of CT guidance. J Bone Joint Surg Am. 1997;203(3):843-8.
12. Lee EH, et al. Osteoid osteoma: A diagnostic dilemma in atypical cases. Orthopedics. 1992.
13. Sim FH, et al. Intralesional resection of osteoid osteoma: Long-term follow-up. J Bone Joint Surg Am. 1984.
14. Witt JD, et al. Arthroscopic excision of intra-articular osteoid osteoma of the hip: A case report. J Bone Joint Surg Br. 1996.
15. Rosenthal DI, Hornicek FJ, Wolfe MW, Jennings LC, Gebhardt MC, Mankin HJ, et al. Percutaneous radiofrequency coagulation of osteoid osteoma compared with operative treatment. J Bone Joint Surg Am. 1998;80(6):815-21.
16. Liu PT, Chivers FS, Roberts CC, Schultz CJ, Beauchamp CP. Imaging of osteoid osteoma with dynamic contrast-enhanced MRI. Radiology. 2003;227(3):691-700.

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