

# Arthroscopic Excision of Osteoid Osteoma of the Femoral Neck

## Abstract

Osteoid osteoma (OO) is a benign, solitary bone tumor of the long bones of the lower limbs and accounts for 10% to 12% of all benign bone. However, an OO of the femoral neck is extremely rare and difficult to treat. Arthroscopic excision of OO of the femoral neck has many advantages. We report a 15-year-old patient with OO of the femoral neck which was treated with arthroscopic excision. The clinical and radiographic findings along with the surgical management of the lesion are presented. The pain disappeared immediately after the operation. At the 14 months' followup, the patient was pain free, and there was no evidence of recurrence.

**Keywords:** Benign, hip arthroscopy, osteoid osteoma, subcortical

**MeSH terms:** Femoral neck, osteoma, osteoid, arthroscopy

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## Introduction

Proximal femur is the most common location of benign bone lesions and its diagnosis is difficult and challenging due its atypical presentation. Early diagnosis and proper treatment is delayed due to confusing clinical and radiological features. Osteoid osteoma presents with recurrent hip pain and abnormal gait which doesn't respond to conservative line of management. Various treatment options have been established like radiofrequency ablation, surgical decompression and excision. Recently, hip arthroscopy has been a good alternative option from other traditional techniques. We report a case of osteoid osteoma of femur neck managed by arthroscopic excision and bone grafting.

## Case Report

A 15-year-old male presented with pain in the left hip for 1 year. The pain was insidious in onset and was initially mild but gradually increased in severity over few months. The pain was relieved with analgesics. He was diagnosed as tuberculosis of hip elsewhere and was put on antitubercular chemotherapy for 4 months, but he did not improve.

The patient when he presented to us, had moderate-to-severe pain, antalgic gait and restricted internal and external rotation of hip. He had night cries and his

activities of daily living were severely compromised. Pain was aggravated on squatting, sitting and was relieved on taking pain killers. Clinical examination showed difficulty in sitting cross legged due to pain [Figure 1] and antalgic gait. The patient had plain radiograph essentially passed normal. The haematological investigations revealed mildly elevated ESR (24 mm/1st hr) and normal CRP. Magnetic resonance imaging (MRI) was done at our center which showed marked bone edema of the inferomedial portion of the anterior femoral neck, suggesting calcified nidus measuring 9 mm in subcortical location probably osteoid osteoma (OO). Computed tomography (CT) scan confirmed the possible diagnosis showing a small sclerotic lesion in the femoral neck [Figures 2 and 3].

Arthroscopic excision of the lesion was our choice of management in this patient because of its location close to articular cartilage and other options such as open surgery, and radiofrequency ablation would have caused further damage to intraarticular structures. Furthermore, we had kept open excision of OO as standby procedure, because the lesion was very close to capsular attachment, which makes the lesion difficult to access with regular 30° arthroscopes. Hip arthroscopy was performed under spinal anesthesia using a traction table. The patient was put in the supine position, and the hip joint was distracted. Capsular distention was done with 20 ml of air, which was confirmed in C-arm. The central compartment was

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approached using the anterior and anterolateral portals. Synovial hypertrophy was addressed with motorised shaver, and partial synovectomy was done. Once the central compartment scopy was finished, traction was released and peripheral compartment scopy was done. Localization of the lesion was done under the guidance of the scope and the image intensifier [Figure 4]. The nidus was removed using a curette, and reactive sclerotic rim was removed using a motorized burr [Figure 5]. A moderated defect was left after the excision which was filled with cancellous bone graft from the ipsilateral iliac crest. No special instruments

were used for the bone grafting purpose. Long right angled bone punch [L shaped] was used to impact the bone graft into the defect [Video 1]. Histological examination showed central osteoblast cells with osteoid and marginal sclerosis confirming the diagnosis of OO. After the operation, the patient's pain completely resolved. Hip range of movements was started after 3 weeks, and he was allowed to weight bear after 1 month of surgery. He was allowed to squat and sit cross legged once there were radiological signs of healing. He had regained full range of movements in the followup. Follow up x ray showed adequate callus formation at femoral neck region [Figure 6]. He remained symptom free at 14 months of followup [Figure 7]. The patient regained normal gait, and he was able to sit cross legged without pain.



Figure 1: Clinical photograph showing patient having difficulty in sitting cross legged on the left side

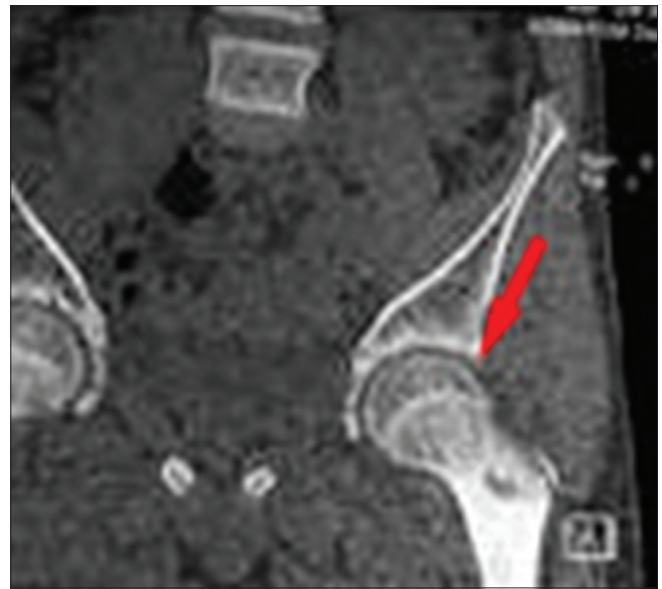


Figure 2: Computed tomography scan (sagittal cut) showing nidus at inferomedial aspect of femoral neck measuring around 9 mm suggestive of osteoid osteoma (Red arrow)

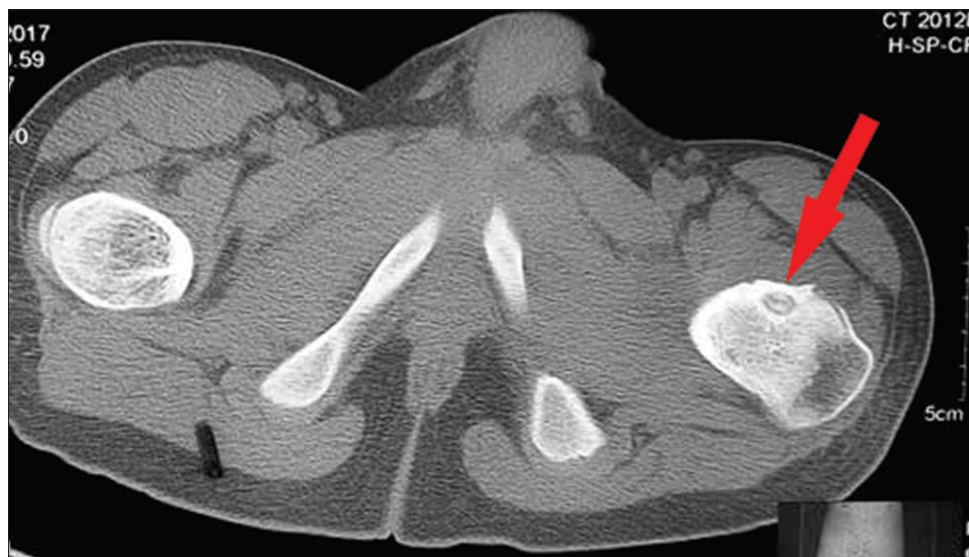


Figure 3: Axial section of computed tomography scan showing nidus in its subcortical location and anterior neck (Red arrow)

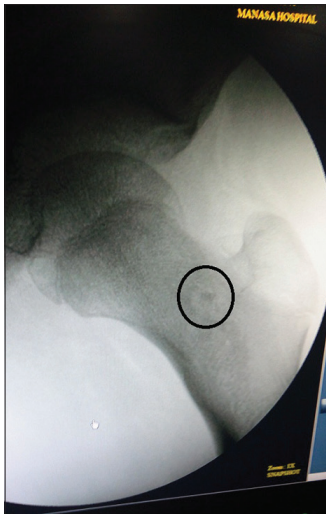


Figure 4: Fluoroscopic examination could locate the lesion which helped to correlate during arthroscopy

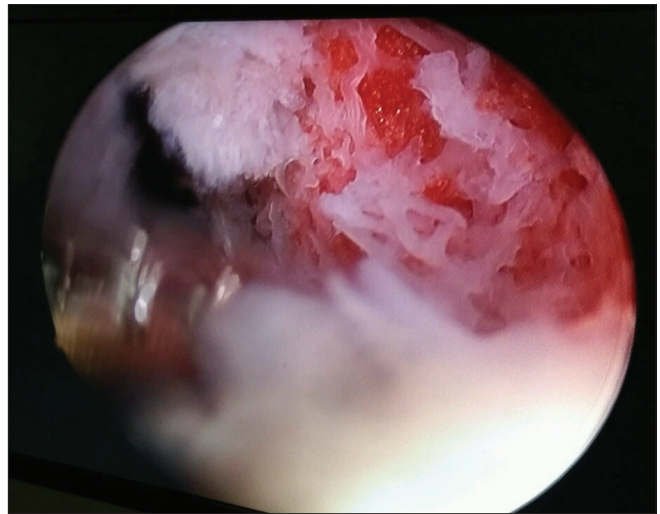


Figure 5: Intraoperative picture after decortication of the lesion with motorized burr



Figure 6: X-ray pelvis with both hip joints anteroposterior (a) and lateral view of hip (b) at 4 months' followup showing signs of healing with adequate callus formation

## Discussion

OO is a benign, solitary bone tumor mostly seen in the long bones of the lower limbs.<sup>1</sup> It was first coined by Jaffe in 1935.<sup>2</sup> It accounts for 10% to 12% of all benign bone lesions and 3% of all primary bone lesions.<sup>3</sup> This lesion most commonly occurs in persons aged 5–25 years, with a male-female ratio of 2:1.<sup>4</sup>

Although any bone can be affected, at least 50% of lesions are reported in the lower limbs.<sup>5</sup> Proximal femur is involved in 25% to 27% of OOs. OOs are intraarticular in location in 5% to 12% of cases.<sup>6</sup> Gaeta *et al.*<sup>6</sup> cited a study by Cohen *et al.* noting that the most common location of intraarticular OO of the hip was the cortex of the medial femoral neck. Patients often presented with increasing pain, with severity more in night, and often relieved with use of

nonsteroidal anti-inflammatory drugs. Apart from typical clinical picture, an OO may have a distinct radiological features, however, in 85% of cases, it presents with small lytic nidus surrounded by sclerotic bone on CT. Therefore, CT remains the investigation of choice to confirm the diagnosis. Furthermore, MRI is useful to confirm and locate the lesion, apart from diagnosing other associated lesions such as labrum tear, hip impingement, and synovitis for varied causes.<sup>7</sup> Therefore, proper history with high index of suspicion, and detailed clinical examination with the help of radiographs, CT scan, and MRI is very important. In this case report, we highlight the rarity of the lesion, our approach to intraarticular pathology and its surgical options.

In recent literature, different treatment options for OO are described such as open surgical *en block* excision,



**Figure 7: Clinical photograph at 14-month followup, patient is pain free and is able to sit cross legged without any difficulty**

percutaneous CT-guided resection, and CT-guided radiofrequency ablation<sup>8</sup> Hip arthroscopy and excision is the modality of treatment of choice in this condition and is also being highlighted here.<sup>9</sup> Of the various surgical options including wide-open or CT-guided minimally invasive techniques, arthroscopic excision was selected in our patient to avoid damage to the adjacent growth plate and to treat concomitant synovitis. Since the lesion was subcortical, it was difficult to identify the lesion by scopy. We correlated the intraoperative findings with C-arm, which helped us to locate the lesion. Lesion was decorticated with motorized burr and removed with curette. Since the lesion was diffuse, we had to remove surrounding sclerosed bone, which required bone grafting. Although the defect was small, there was no need for internal fixation, just bone grafting was sufficient. Bone grafting was done here, to avoid stress raiser at the femoral neck, which has not been mentioned in any studies. Bone graft was also used as filling substance. The advantages of arthroscopy are minimal surgical approach, proper localization of the lesion, additional evaluation, and treatment of the associated cartilage defect if present. Disadvantages of the technique are potential failure of arthroscopic approach due to failure of traction, and limited reach to the lesion. Furthermore, there is a possibility of nerve injury and also incomplete excision of the nidus.<sup>10</sup>

Said *et al.*<sup>7</sup> presented 2 cases that underwent an arthroscopic removal of OO of the femoral neck. The patients improved

dramatically postoperatively. Lee *et al.*<sup>10</sup> presented 2 cases of hip joint OO in children treated by hip arthroscopy. In both cases, postoperative CT showed complete excision and histologic examination confirmed the diagnosis. Both patients enjoyed excellent clinical outcomes. Hip arthroscopy also yielded a biopsy specimen adequate for pathologic examination.

To conclude, OO of the femoral neck is a rare diagnosis that may be responsible for a painful restriction of hip motion. MRI should arouse suspicion however CT scan is the gold standard investigation to make a diagnosis. Early diagnosis and adequate treatment by arthroscopic excision of the nidus can give good results of pain relief and early recovery.

#### **Declaration of patient consent**

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient has given his consent for his images and other clinical information to be reported in the journal. The patient understands that name and initials will not be published and due efforts will be made to conceal his identity, but anonymity cannot be guaranteed.

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Nil.

#### **Conflicts of interest**

There are no conflicts of interest.

#### **References**

1. Barnhard R, Raven EE. Arthroscopic removal of an osteoid osteoma of the acetabulum. *Knee Surg Sports Traumatol Arthrosc* 2011;19:1521-3.
2. Jaffe HL. Osteoid osteoma: A benign osteoblastic tumor composed of osteoid and atypical bone. *Arch Surg* 1935;31:709-28.
3. Frassica FJ, Waltrip RL, Sponseller PD, Ma LD, McCarthy EF Jr. Clinicopathologic features and treatment of osteoid osteoma and osteoblastoma in children and adolescents. *Orthop Clin North Am* 1996;27:559-74.
4. Peyser A, Applbaum Y, Simanovsky N, Safran O, Lamdan R. CT-guided radiofrequency ablation of pediatric osteoid osteoma utilizing a water-cooled tip. *Ann Surg Oncol* 2009;16:2856-61.
5. Cohen MD, Harrington TM, Ginsburg WW. Osteoid osteoma: 95 cases and a review of the literature. *Semin Arthritis Rheum* 1983;12:265-81.
6. Gaeta M, Minutoli F, Pandolfo I, Vinci S, D'Andrea L, Blandino A, *et al.* Magnetic resonance imaging findings of osteoid osteoma of the proximal femur. *Eur Radiol* 2004;14:1582-9.
7. Said HG, Abdulla Babaqi A, Abdelsalam El-Assal M. Hip arthroscopy for excision of osteoid osteoma of femoral neck. *Arthrosc Tech* 2014;3:e145-8.
8. Pratali R, Zuiani G, Inada M, Hanasilo C, Reganin L, Etchebehere E, *et al.* Open resection of osteoid osteoma guided by a gamma-probe. *Int Orthop* 2009;33:219-23.
9. Khapchik V, O'Donnell RJ, Glick JM. Arthroscopically assisted excision of osteoid osteoma involving the hip. *Arthroscopy* 2001;17:56-61.
10. Lee DH, Jeong WK, Lee SH. Arthroscopic excision of osteoid osteomas of the hip in children. *J Pediatr Orthop* 2009;29:547-51.