

# Resolution of Proximal Humerus Enchondroma in a 53-Year-Old Female with Curettage and Bone Substitution: A Case Report

V M Balurakshith<sup>1</sup>, U Thyagarajan<sup>1</sup>, M I Rayeez Ahmed<sup>1</sup>

## Learning Point of the Article:

Painful proximal humerus enchondromas in older adults should always be carefully evaluated to exclude low-grade chondrosarcoma. Histopathological confirmation remains essential for definitive diagnosis.

## Abstract

**Introduction:** Enchondromas are benign cartilaginous tumors commonly affecting the small bones of the hand; however, proximal humeral involvement presenting with persistent pain in older adults is uncommon and may mimic low-grade chondrosarcoma.

**Case Report:** A 53-year-old female presented with right shoulder pain and proximal humeral swelling. Radiographs, magnetic resonance imaging, and computed tomography imaging demonstrated a lobulated intramedullary cartilaginous lesion with cortical thinning and endosteal scalloping. The patient underwent curettage of the lesion, biopsy, and bone grafting using bone substitutes. Histopathological examination confirmed an enchondroma. Post-operative follow-up demonstrated satisfactory graft incorporation and symptomatic improvement.

**Conclusion:** This case highlights the importance of prompt radiological investigations, and histopathological examination is essential for accurate diagnosis, management with curettage and bone substitution, which showed good incorporation and outcome.

**Keywords:** Enchondroma, low-grade chondrosarcoma, curettage, graft incorporation.

## Introduction

Enchondromas are benign intramedullary cartilaginous neoplasms arising from residual growth plate cartilage [1]. Although commonly found in the small bones of the hands and feet, long bone involvement, such as the proximal humerus, is less common [1,2]. Symptomatic lesions in older adults may mimic low-grade chondrosarcoma clinically and radiologically, creating diagnostic difficulty [2,3,4,5]. This report presents a symptomatic proximal humerus enchondroma in a 53-year-old female managed successfully with curettage and bone grafting.

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commonly found in the small bones of the hands and feet, long bone involvement, such as the proximal humerus, is less common. Symptomatic lesions in older adults may mimic low-grade chondrosarcoma clinically and radiologically, creating diagnostic difficulty. This report presents a symptomatic proximal humerus enchondroma in a 53-year-old female managed successfully with curettage and bone grafting.

## Case Report

A 53-year-old female presented with complaints of right shoulder pain for 1 year, aggravated over the preceding 15 days. Pain was insidious in onset, gradually progressive, dull aching in

## Author's Photo Gallery



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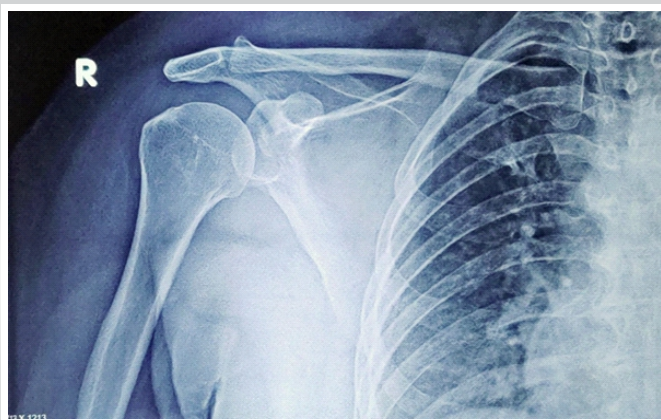
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**Figure 1:** Pre-operative anteroposterior radiograph showing osteolytic lesion in proximal humerus.

nature, aggravated by shoulder movements, and relieved by rest. Mild swelling over the right shoulder was present for 6 months. There was no history of trauma, fever, weight loss, pathological fracture, or constitutional symptoms. The patient was a known case of hypothyroidism on regular medication. The patient was initially treated conservatively with analgesics and physiotherapy, resulting in relief of symptoms.

### Clinical examination

On local examination, mild swelling and tenderness were noted over the proximal humerus and deltoid region. Terminally painful shoulder abduction and painful restriction of internal rotation were observed. Distal neurovascular status, including the distal pulse and sensations were intact.

### Imaging

Plain radiographs of the shoulder, an anteroposterior view were taken, which revealed a well-defined osteolytic lesion involving the proximal metaphysis of the right humerus (Fig. 1). Magnetic resonance imaging (MRI) of Shoulder joint demonstrated a hyperintense intramedullary cartilaginous lesion suggestive of an enchondroma with associated chronic tendinosis changes (Fig. 2). Computed tomography (CT) scan

of the shoulder demonstrated endosteal scalloping and cortical thinning (Fig. 3).

### Management and hospital course

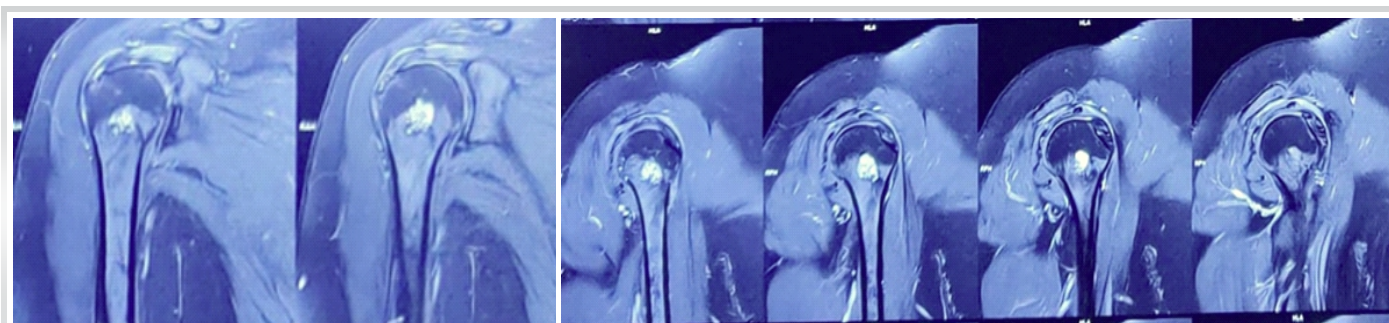
The patient was admitted and advised for surgical management. Under strict aseptic precautions, the procedure was performed under general anesthesia with the patient in a supine position. The skin was painted and draped. A skin incision was made over the lateral aspect of the proximal humerus. The bony lesion was identified under C-arm guidance, and a thorough curettage of the lesion was performed. Samples were sent for histopathological examination. The void in the proximal humerus was filled using Beta-Tricalcium phosphate granules and hydroxyapatite granules. The skin and soft tissues were closed in layers, and a sterile dressing was applied.

### Results

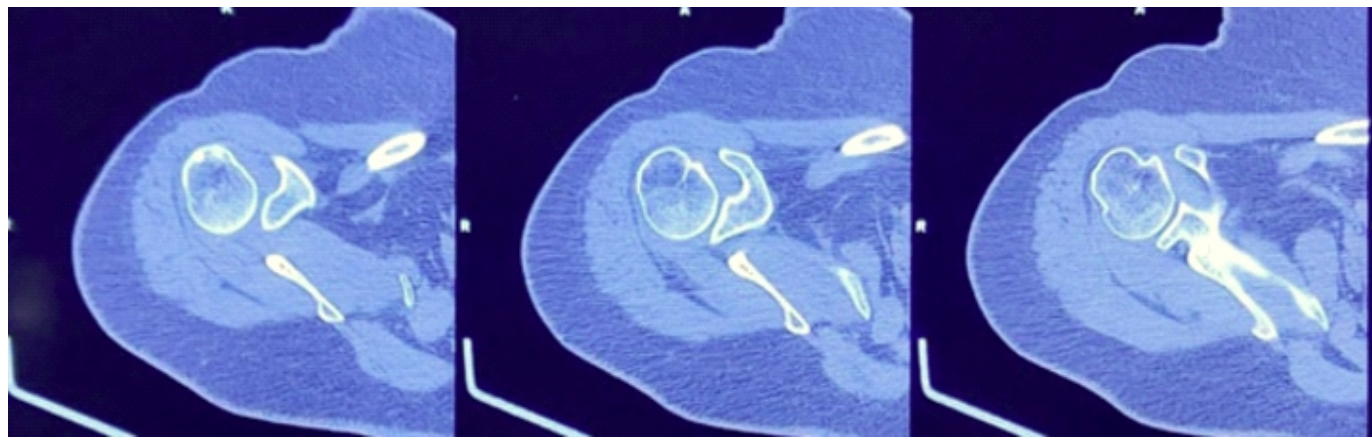
Postoperatively, the patient remained comfortable with satisfactory wound healing and no immediate complications. Pendulum exercises were initiated on post-operative day 2, followed by progressive shoulder mobilization. Histopathological examination revealed lobules of hyaline cartilage with mild cellularity and mild nuclear atypia, consistent with enchondroma. Preoperatively, the patient's Visual Analogue Scale (VAS) pain score was 4/10. At the 2-month follow-up, the VAS score improved to 1/10, indicating substantial pain relief. Pre-operative shoulder range of motion was within normal limits, although abduction was painful. At final follow-up, the patient demonstrated a full painless range of shoulder motion without functional restriction. Follow-up radiographs demonstrated satisfactory incorporation of the bone substitute without evidence of recurrence, pathological fracture, graft-related complications, or implant failure (Fig. 4,5).

### Discussion

Enchondromas are typically benign, asymptomatic



**Figure 2:** Magnetic resonance images showing an intramedullary cartilaginous lesion.

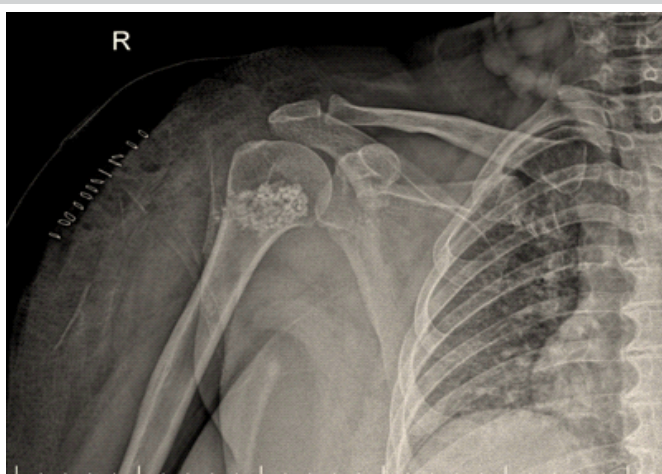


**Figure 3:** Computed tomography images showing endosteal scalloping and cortical thinning.

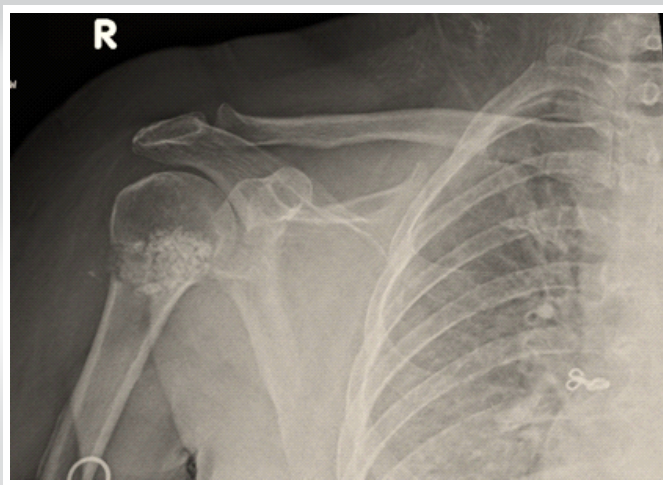
cartilaginous tumors; however, painful lesions in long bones require careful assessment to rule out low-grade chondrosarcoma [1,2]. Symptoms such as pain, cortical thinning, and endosteal scalloping are concerning features that often require biopsy [2,4,5]. MRI and CT imaging are crucial in distinguishing benign from malignant cartilaginous lesions [2,4,6,7]. Histopathological examination remains the definitive standard for diagnosis [1,7,8,9]. Surgical treatment, including curettage and bone grafting, remains effective for symptomatic lesions [1,8]. This case highlights the importance of integrating clinical, radiological, and histopathological findings in diagnosing a symptomatic enchondroma of the proximal humerus. Contemporary literature supports intralesional curettage with bone graft substitutes as a reliable treatment option with low recurrence rates and satisfactory functional outcomes in appropriately selected patients [10].

Painful enchondromas of the proximal humerus present a diagnostic challenge because clinical and radiological features

may overlap with those of low-grade chondrosarcoma. Features such as persistent pain, cortical thinning, and endosteal scalloping need careful evaluation with advanced imaging and histopathological confirmation. Recent literature supports MRI and CT as valuable modalities for assessing cortical integrity, endosteal scalloping, and soft-tissue extension. Histopathology remains the diagnostic gold standard, although immunohistochemical and molecular studies may further assist in difficult cases. Intralesional curettage remains the preferred treatment for symptomatic benign cartilaginous lesions. In the present case, beta-tricalcium phosphate and hydroxyapatite granules were selected because they eliminate donor-site morbidity associated with autograft harvest, provide structural support, and demonstrate favorable osteoconductive properties. Published series have reported low recurrence rates and satisfactory functional outcomes following curettage and bone substitute augmentation. The favorable early clinical and radiological outcome observed in our patient is consistent with



**Figure 4:** Immediate post-operative radiograph after curettage and bone grafting.



**Figure 5:** Follow-up radiograph taken at 2 month post-operative showing satisfactory graft incorporation.

these reports. Nevertheless, long-term follow-up is necessary to evaluate recurrence, graft remodeling, and sustained functional recovery.

Curettage followed by defect filling with bone substitutes such as beta-tricalcium phosphates and hydroxyapatite granules remains a safe and effective treatment for symptomatic enchondromas. In this case, surgical management resulted in satisfactory pain relief, improved function, and radiological evidence of graft incorporation without recurrence during follow-up. The procedure avoided complications like pathological fracture and provided a definitive histopathological diagnosis. Longer follow-up and larger studies are needed to further assess the long-term outcomes of graft substitutes and bone void fillers in managing enchondromas of long bones.

### Limitations

This report describes a single patient, and therefore, the findings cannot be generalized to the wider population. The inherent nature of a case report precludes comparison with alternative treatment strategies such as observation, autologous bone grafting, allograft reconstruction, or cement augmentation. Furthermore, the relatively short follow-up period of 2 months is insufficient to evaluate long-term outcomes, including recurrence, graft incorporation, functional durability, or malignant transformation.

Objective functional assessment was limited, as validated outcome measures such as the DASH, ASES, or Constant-Murley scores were not utilized. Pain assessment was documented using the VAS, which improved from 4/10

preoperatively to 1/10 postoperatively. Pre-operative shoulder motion was preserved with painful abduction, while post-operative assessment demonstrated a full painless range of motion.

Although histopathological examination confirmed enchondroma, immunohistochemical and molecular studies were not available at our institution. Similarly, an independent second-opinion pathology review was not available. Therefore, differentiation from low-grade chondrosarcoma relied on the combined clinical, radiological, and histopathological findings.

Long-term follow-up data were unavailable at the time of manuscript preparation. Potential complications, including graft failure, infection, pathological fracture, persistent pain, recurrence, and long-term graft remodeling, could not be systematically evaluated. Finally, selection bias is unavoidable because only a successfully treated case is presented.

### Conclusion

Symptomatic enchondroma of the proximal humerus in older adults can mimic low-grade chondrosarcoma clinically and radiologically. Multimodal imaging and histopathological confirmation are essential for accurate diagnosis. Curettage with bone grafting provides satisfactory clinical and radiological outcomes.

### Clinical Message

Intralesional curettage followed by bone substitute grafting is an effective treatment option for symptomatic proximal humerus enchondromas, resulting in pain relief and satisfactory radiological healing.

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

**Conflict of interest:** Nil **Source of support:** None

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