SAS Journal of Surgery
Abbreviated Key Title: SAS J Surg
ISSN 2454-5104
Journal homepage: https://www.saspublishers.com

OPEN ACCESS

Orthopedics

Management of Unusual Osteoid Osteoma of Coronoid Process: A Case Report

João Duarte Gardete Gameiro[1*], João Miguel Fernandes Neves[1], Liliana Sofia Amaral Domingues[1], Inês Filipa Da Silva Domingues[1], Rui Duarte Teixeira Cunha[1], Ana Catarina Bispo[1]

MD, Hospital Ortopédico Sant'Iago do Outão, ULSA

DOI: 10.36347/sasjs.2024.v10i07.007 | **Received:** 19.05.2024 | **Accepted:** 03.07.2024 | **Published:** 06.07.2024

***Corresponding author:** João Duarte Gardete Gameiro
MD, Hospital Ortopédico Sant'Iago do Outão, ULSA

Abstract | **Case Report**

Osteoid osteomas are rare benign tumors that affect commonly long bones, with typical manifestations, like nocturnal pain and good response to NSAIDs. When presented in juxtaarticular location, in elbow, the diagnosis can be challenging. The typical radiograph shows a nidus in radiolucent area within cortical thickening which can be interpreted as normal when bone overlap occurs. CT scan can be very helpful as diagnostic tool. We report a case of an osteoma osteoid in the coronoid process of ulna conditioning pain and limited ROM despite conservative treatment. Nidus was successfully removed with an anterior approach and en bloc resection, curettage, and radiofrequency ablation. The bone defect was filled with synthetic allograft and full ROM intraoperative confirmed.

Keywords: Osteoid osteoma, juxta articular, elbow, en bloc, radiofrequency ablation.

INTRODUCTION

Osteoid osteoma typically manifests as a benign tumor, commonly observed in individuals aged between 10 and 30 years, with a male-to-female ratio of approximately 2:1 [1]. They constitute approximately 12% of all benign bone tumours. In more than half of the instances, they originate at the cortical surface of the diaphysis, predominantly affecting the femur or tibia [2].

Typically, osteoid osteomas exhibit a histological makeup characterized by a compact cluster of osteoblasts and osteoid material, arranged irregularly over several millimetres. This core is surrounded by a peripheral network of nerves and arteries. The progression of osteoid osteoma seems to involve a phase of growth followed by spontaneous regression, often occurring over a span of up to 15 years. However, it's noteworthy that many patients seek medical intervention before this natural regression phase completes [2]. Typically, the lesion manifests within the cortical bone as an area of sclerosis and thickening. A classification system was proposed, dividing the benign tumour into three types: cortical, medullary, and periosteal. Among these, cortical lesions are the most frequently encountered [3].

Diagnosing a benign bone tumour around the elbow can pose a challenge for clinicians. The presence of nocturnal pain and specific symptoms alleviated using non-steroidal anti-inflammatory drugs (NSAIDs) can aid in diagnosing osteoid osteoma.

Recently, we encountered an unusual case of an osteoid osteoma of coronoid process in the elbow. The patient exhibited pain with activities of daily living, being initially responsive to NSAIDs, but after a couple of months, were not effective at all for relieving his symptoms. His Range of motion (ROM) was also limited, with a extension lag of 15º. The combination of imaging findings successfully led to a diagnosis of Osteoid Osteoma of coronoid process and a surgical resection was done. To our knowledge this is a very rare case (less than 5 reported worldwide) of this diagnosis in this location.

CASE REPORT

A 42-year-old man presented with pain and stiffness of his right elbow. The constant pain started 6 months ago and increased over the previous 3 months. The elbow pain was worse at night and when he attempted to extend his elbow. Initially, the Range of motion (ROM) was between -15º and 140º of extension and flexion respectively, and the pain was relieved with rest and NSAID. Gradually, the pain became resistant to conservative treatment and the patient complain of it in most daily activities, making difficult to work. Physical

examination 3 months before surgery showed local anterior tenderness of the elbow and the range of motion (ROM) was between -30º and 140º of extension and flexion respectively. Pronation and supination were unrestricted.

Anteroposterior and lateral radiographs of the right elbow was interpreted as normal. Magnetic Resonance Imaging depicted a bone marrow edema and hyperemia in the proximal ulna, close to the tip of the coronoid process (Figure 1). Following initial assessment, computed tomography (CT) scans were requested to confirm the presence of the lesion in the proximal ulna. The CT showed: "osteoid osteoma with nidus at the apex of the coronoid process with contact with the articular surface and extensive surrounding corticomedullary edema." (Figure 2).

Figure 1: Sagittal MRI of the elbow showing area of hyperemia and bone marrow edema

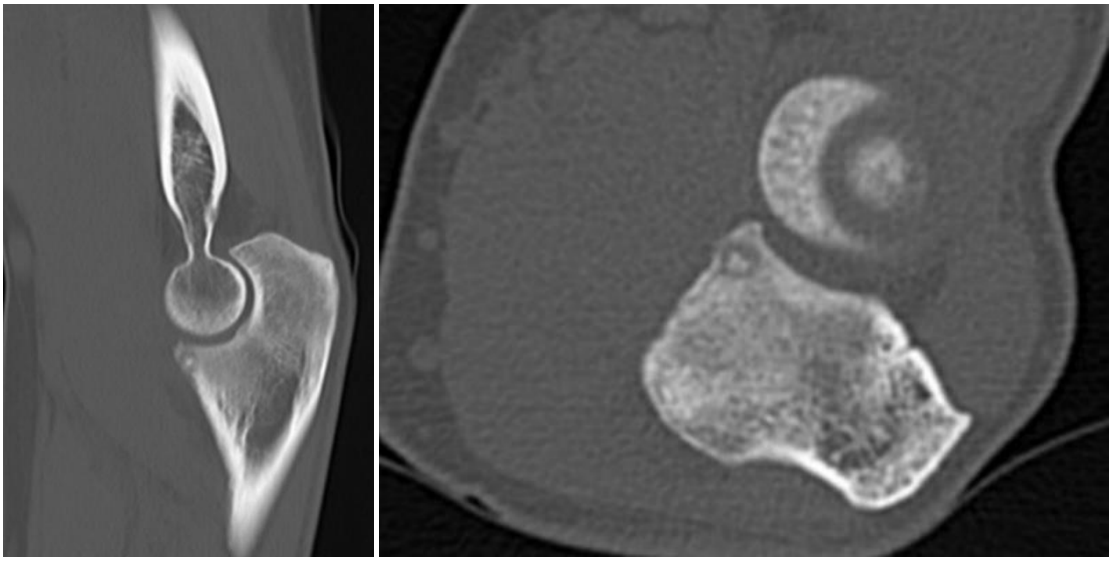


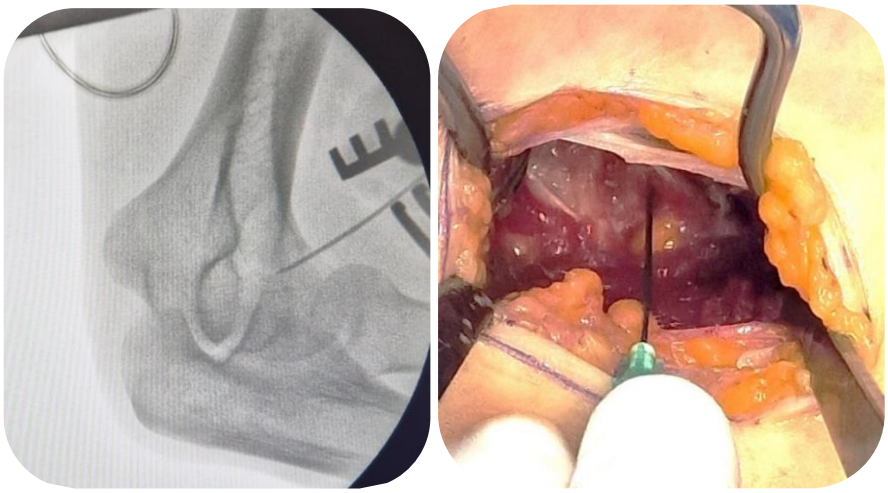
Figure 2: (A) Sagittal CT of the elbow and (B) Axial CT of the elbow showing nidus at the apex of coronoid process with contact with the articular surface and extensive surrounding corticomedullary edema

Surgical Procedure

Our plan was to remove the lesion surgically en bloc and preform radiofrequency ablation under fluoroscopy guidance to control the position and area of the lesion with the aid of an IM needle. With inflated tourniquet, an anterior approach to the elbow was performed, Median nerve and Brachial artery were identified and preserved (figure 3). The coronoid process was exposed and the area of roughened cortex "nidus" with the guidance of IM needle was identified (figure 4). An En bloc procedure was done, and the specimen was sent to Pathology Department. Curettage of the area (figure 5) and radiofrequency ablation of the defect was performed, and the bony defect filled with synthetic bone graft (figure 6). The surgical wound was closed, and we confirmed a full ROM. Histological examination of the defect confirmed the diagnosis of Osteoid Osteoma. At 6 months follow-up, the patient has no limitation on

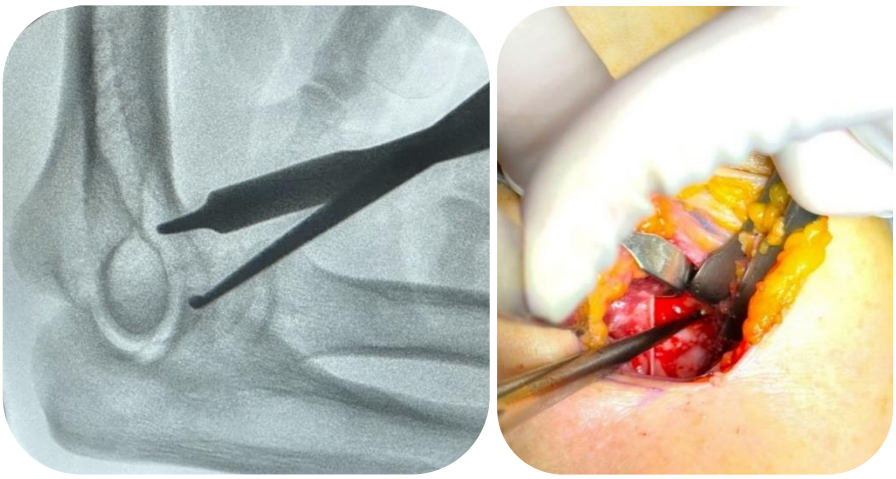
extension and flexion, with full ROM. The patient has no activity limitations, no pain, and the control radiograph shows no abnormalities in articular cartilage, and a tip of coronoid process reestablished.

Figure 3: Anterior approach of the elbow with median nerve and brachial artery exposed. Reference: Superior corresponds to proximal



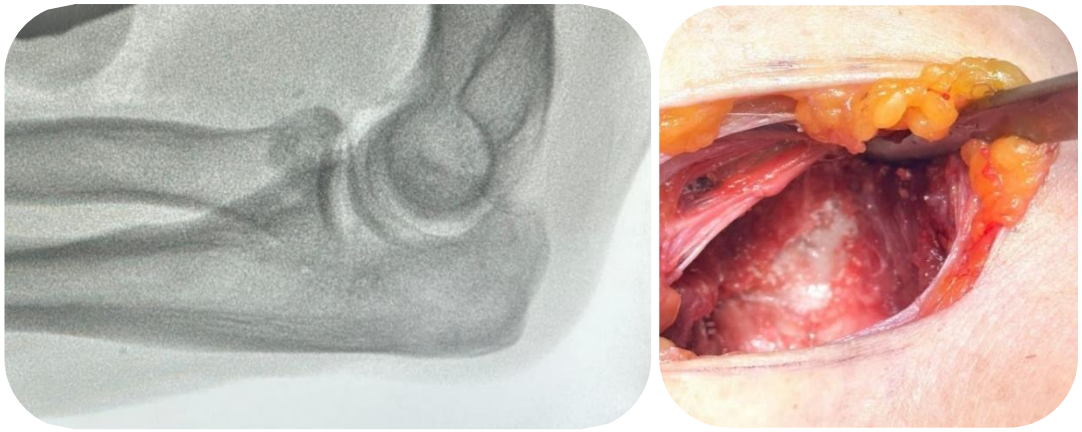
A B

Figure 4: (A)Lateral radiograph of the elbow and (B) direct view, showing IM needle as position guide in tip of coronoid process



A B

Figure 5: (A) Lateral radiograph of the elbow showing length of osteoid osteoma resected. (B) Curettage nidus of osteoid osteoma



A B

Figure 6: (A) Lateral radiograph of the elbow showing tip of coronoid process filled with synthetic graft. (B) Final appearance after en bloc resection, curettage, radiofrequency ablation and fill with synthetic graft

DISCUSSION

Osteoid osteomas are benign tumors commonly found in long bones or the spine [7, 11]. They typically comprise a small cluster of osteoid tissue, characterized by osteoblasts forming a highly vascularized and innervated nidus, enclosed within a region of reactive sclerotic bone [12]. The characteristic alleviation of pain by nonsteroidal anti-inflammatory agents is a hallmark feature of osteoid osteomas. It's hypothesized that these agents exert their effect by inhibiting the heightened prostaglandin synthesis associated with these lesions [4]. Cases of juxtaarticular osteoid osteoma are infrequently documented in the literature, with only a handful of reports highlighting its occurrence in the proximal ulna [5]. The occurrence of osteoid osteoma in this location in quite rare. In 2000, Becker *et al.,* [1] reviewed the literature, finding 1 case of osteoid osteoma in coronoid process. To our knowledge, the case reported here was the first describing a patient over 30 years of age, outside the average age at which diagnosis is common [1, 5, 7, 8, 10]. In patients presenting with an unusual location of osteoid osteoma and an atypical clinical picture, diagnosis may be delayed as the symptoms can mimic those of other clinical conditions like synovitis, stress fracture, or infection [10]. On plain radiographs, osteoid osteoma typically manifests as a well-defined round or oval lesion with a radiolucent nidus. Reactive sclerosis surrounding cortical lesions can sometimes obscure the central nidus. In subchondral locations, observable changes in bone on radiographs may be absent or minimal [5]. Prior to proceeding with surgical or percutaneous removal, it is crucial to accurately localize the lesion using computed tomography (CT) imaging [1]. Mnif *et al.*, [5] suggested percutaneous CT guided approach as best way of treatment preserving vital structures (median nerve, brachial artery and cartilage). With limited resources in our hospital, becoming impossible to do CT guided approach, we decided to proceed with an anterior approach, protecting neurovascular structures and with direct articular view. En bloc resection remains the sole technique ensuring a definitive histological diagnosis, albeit it necessitates a larger bone excision compared to the actual size of the lesion. As we couldn't be sure of the full resection of the lesion, including the hole nidus, after curettage, we proceed with radiofrequency ablation with the care to remain far from the cartilage tissue. Martel *et al.,* [12] concluded that maintaining intact cortical bone during the radiofrequency procedure provides protection to surrounding structures, particularly cartilage, attributed to the 'insulating effect". As the location was juxta-articular, we filled the gap after resection with synthetic graft filling all the gap, preserving the anatomical integrity.

CONCLUSION

Osteoid osteoma is a rare benign tumor. The juxta-articular presentation in the elbow and satisfactory response to NSAIDs can mimic many pathologies and become difficult to perform an early diagnosis. A radiograph is easily interpreted as normal, and a CT scan is a powerful tool as diagnosis and surgical planning. The surgical choice may tend to en bloc resection or radiofrequency ablation depending on size, distance to the chondral region and approach route.

REFERENCES

1. Becker, P. L., Heywood, H. B. III, & Crosby, L. A. (2000). Osteoid osteoma of the coronoid process: case report and review of the literature. *J Shoulder Elbow Surg*, *9*, 446-8.
2. Cantwell, C. P., Obyrne, J., & Eustace, S. (2004). Current trends in treatment of osteoid osteoma with an emphasis on radiofrequency ablation. *Eur Radiol*, *14*, 607-17.
3. Unni, K. K. (1996). Dahlin's bone tumours: General aspects and data on 11,087 Cases. *Journal Name*, Volume, Page Range. (Lippincott-Raven, Philadelphia, vol 9, pp 121–130; vol 10, pp 131–142)
4. Bednar, M. S., McCormack, R. R., Glasser, D., & Weiland, A. J. (1993, November). Osteoid osteoma

of the upper extremity. *The Journal of Hand Surgery*, *18*(6), 1019–1025.

5. Mnif, H., Kammoun, M. H., Zrig, M., Koubaa, M., & Abid, A. (2009, July). Osteoid osteoma of the coronoid process tip. *Journal of Shoulder and Elbow Surgery*, *18*(4), e9–e12.
6. Tounsi, N., Trigui, M., Ayadi, K., Kallel, S., Boudaouara Sallemi, T., & Keskes, H. (2006, September). Ostéome ostéoïde de l'olécrane. *Revue De Chirurgie Orthopédique Et Réparatrice De L'Appareil Moteur*, *92*(5), 495–498.
7. Decramer, A., Degreef, I., Sciot, R., & De Smet, L. (2009, July). Osteoid osteoma of the coronoid process with involvement of the proximal radioulnar joint: A case report. *Journal of Shoulder and Elbow Surgery*, *18*(4), e6–e8.
8. Akman, S. (2009). Osteoid osteoma of the coronoid process causing flexion contracture of the elbow. *Acta Orthopaedica Et Traumatologica Turcica*, *43*(4), 373–375.
9. Džupa, V., Bartoníček, J., Šprindrich, J., Neuwirth, J., & Švec, A. (2001, January 1). Osteoid osteoma of olecranon process of ulna in subchondral location. *Archives of Orthopaedic and Trauma Surgery*, *121*(1–2), 117–118.
10. GÜMÜŞTAŞ, S. A., ÇEVİK, H. B., & KAYAHAN, S. (2020, August 1). Management of Osteoid Osteoma in Unusual Locations. *Acta Chirurgiae Orthopaedicae Et Traumatologiae Cechoslovaca*, *87*(4), 285–291.
11. Jaffe, H. L. (1935). Osteoid osteoma. A benign osteoblastic tumor composed of osteoid and atypical bone. *Arch Surg*, *31*, 709-28.
12. Murray, P. Primary bone tumors. In: Berger RA, Weiss AC, editors. Hand surgery. Philadelphia: Lippincott Williams & Wilkins; 2004. p. 1753-68.
13. Martel, J., Bueno, A., Domı´nguez, M. P., Llorens, P., Quiro´s, J., & Delgado, C. (2008). Percutaneous radiofrequency ablation: relationship between different probe types and procedure time on length and extent of osteonecrosis in dog long bones. *Skeletal Radiol*, *37*, 147-52.
14. Fukuda, R., Matsuoka, M., Kawamura, D., Endo, T., Kanno-Okada, H., Urita, A., Matsui, Y., Onodera, T., & Iwasaki, N. (2022, April). Intra-articular osteoid osteoma at the elbow mimicking arthritis: a case report. *Annals of Joint*, *7*, 20–20.