

# An exceptional localisation of osteoid osteoma

H Mnif, M Kammoun, M Zrig, M Koubaa, A Abid

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## Abstract

Osteoid osteoma is a small tumor, always benign. Located preferentially on the long bones, femur and tibia, elbow location is rare. We present a case of an Osteoid osteoma in unusual subperiosteal localization in the tip of the coronoid process. The lesion was removed by en bloc resection under CT-guidance. This approach enabled us to avoid damaging the proximal structures, to examine the lesion, and to fill the bony defect with autologus bone-graft. This presentation marks the first case reported in this precise subperiosteal localization.

## INTRODUCTION

Osteoid osteoma is a small, benign and painful tumor most commonly affecting the extra articular portions of the long bones, especially the femur and tibia.

It has characteristic manifestations (pain, more often at night, responding to salicylates) and typical X-ray image (a nidus with a small radiolucent area within an extensive reactive cortical thickening).

The localization in the elbow at the juxta articular level shows an atypical picture that causes both diagnostic and therapeutic problem.

We present a case of an exceptional subperiosteal osteoid osteoma localized in the tip of the coronoid process just beneath the cartilage joint of the elbow. The nidus was successfully removed by en bloc resection under CT-guidance.

## CASE REPORT

A 16-year-old adolescent presented with pain and stiffness of his right elbow.

He reported a 9-months history of elbow pain, which had begun insidiously and increased over the previous 3 months. The elbow pain was worse at night and was relieved by aspirin.

Physical examination revealed local anterior tenderness of the elbow.

The patient had no appreciable muscle wasting. The range of motion of the elbow was between 30° and 100° of flexion

and extension. Pronation and supination were unrestricted.

The plain antero posterior radiographs of the right elbow were showed sclerosis of proximal ulna (Fig. 1a), but the lateral view (Fig. 1b) showed a lucent area in the coronoid tip.

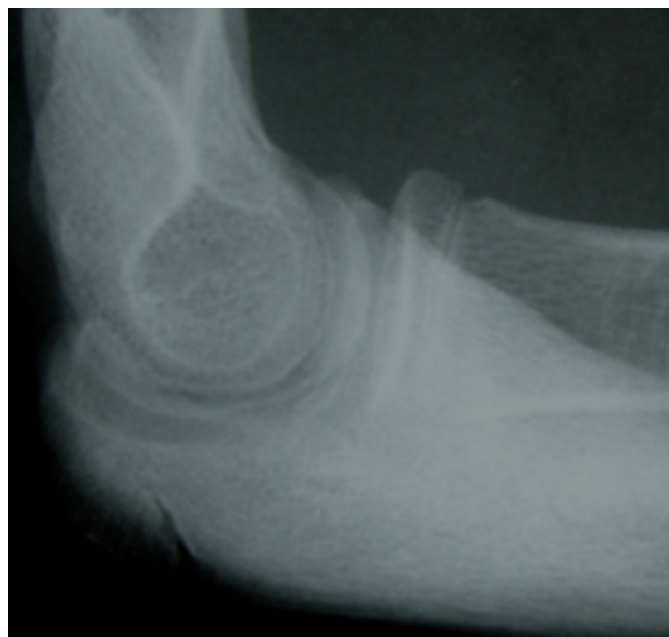
## Figure 1

Figure 1a



**Figure 2**

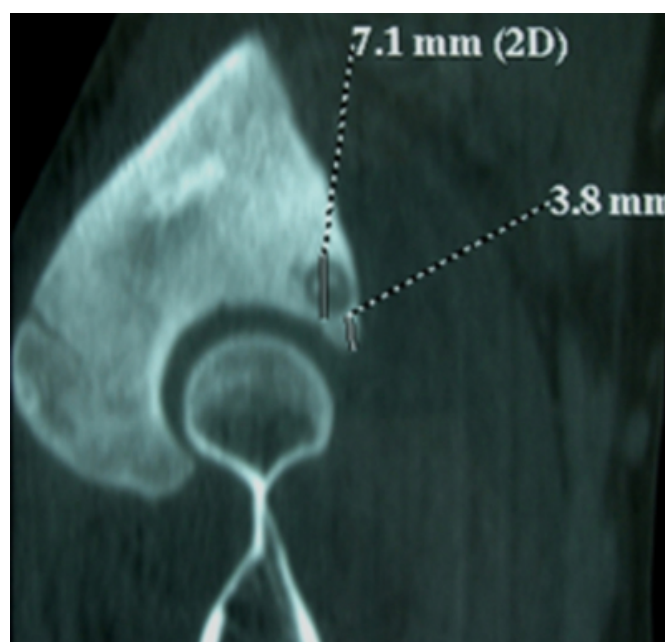
Figure 1b



The CT-scan confirmed 7.1 mm lucent area in the subperiosteal area of the coronoid process tip with an irregular, opaque shadow in the central part and thickening of anterior cortex. Sagittal CT-scan revealed the nidus clearly in subperiosteal area of the coronoid process tip, 3.8 mm under the subchondral bone and thickening of anterior cortex of the elbow (fig. 2a). Axial CT-scan showed a maximum horizontal diameter of 7.1 mm of the nidus (fig.2b).

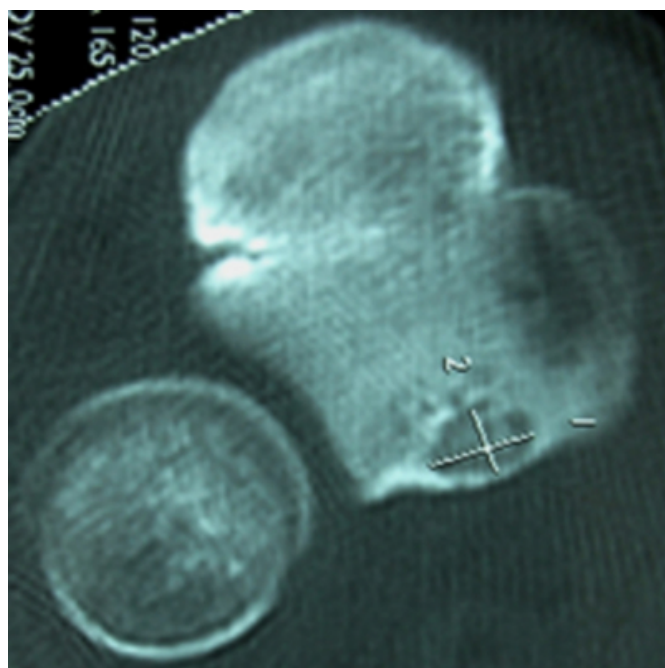
**Figure 3**

Figure 2a



**Figure 4**

Figure 2b



The plan was to remove the lesion surgically en bloc under CT guidance to precisely control the position of the guide.

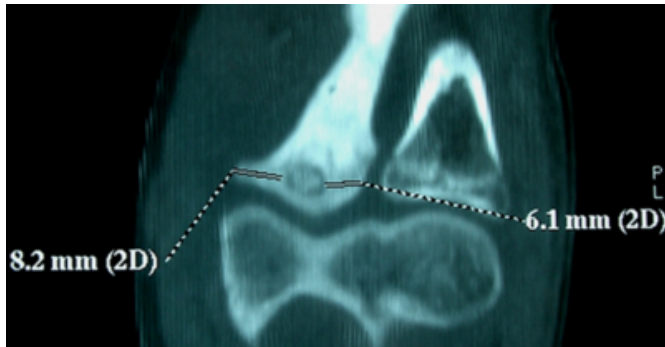
#### Surgical procedure

The patient was transported to the CT radiology room where he was met by the surgical team (an orthopaedic surgeon, a radiologist, and an anaesthetist).

The patient received loco regional anaesthesia and was placed securely in a supine position on the CT moving table. Section thicknesses of 1 mm were obtained to determine the precise localization of the nidus (Fig.3).

**Figure 5**

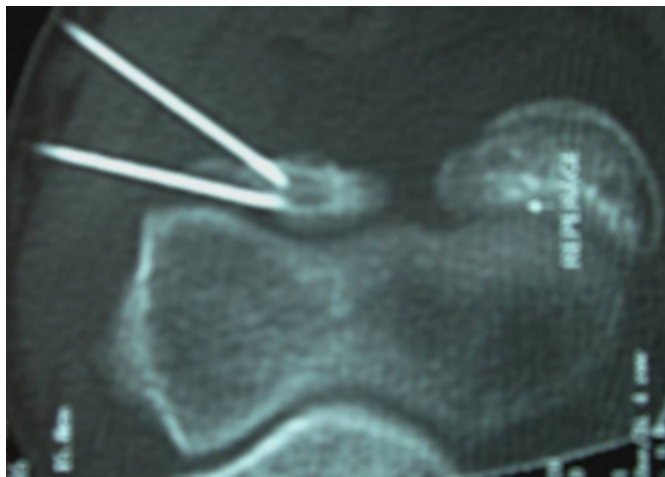
Figure 3: Preoperative coronal view CT-scan of the elbow, showing the precise localization of the nidus



Both 30° Kirschners guidewires tilted on the coronal plane were percutaneously inserted under CT control. The coronal-view CT control scan showed the central placement of the Kirschners guidewires into the lesion (Fig.4).

**Figure 6**

Figure 4: Coronal-view CT control scan, showing the central placement of the Kirschners guidewires into the nidus.



Following this initial procedure, the patient was transferred to surgery for the surgical removal of the lesion. The elbow was exposed through a vertical anteromedial approach corresponding to the entry of the K-wire, the flexor and pronator muscles were carefully retracted medially and the median nerve and biceps tendon laterally. The coronoid process was exposed and with the guidance of the K-wires, the bone block of calculated depth and dimensions (about 1 cm<sup>3</sup>) was removed. Curettage of the remaining defect was performed. The gross bone specimen that was removed

revealed the incorporated lesion; the articular cartilage integrity was then demonstrated.

To fill the bony defect, an autologous bone graft was harvested from the ipsilateral olecranon through a vertical posterior approach. The bone plug was press-fitted directly into the defect.

Histological examination of this surgical specimen confirmed the diagnosis of osteoid osteoma.

At 05-year follow-up, he had a residual flexion contracture of 10 degrees and flexion to 110 degrees. The patient had no pain and no limitation of activities.

The radiograph, showed that the integrity of articular cartilage and the absence of any recurrence of the tumour (Fig. 5a, 5b).

**Figure 7**

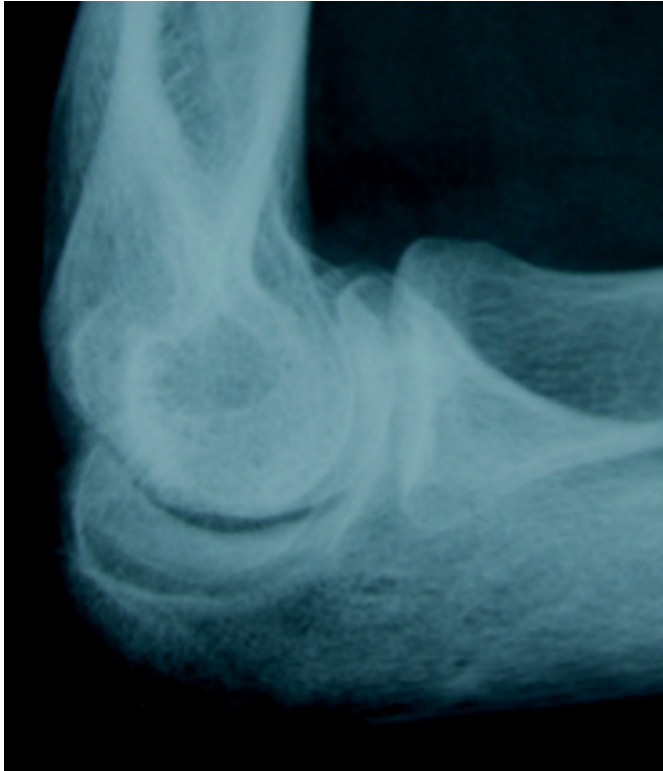
Figure 5a





**Figure 8**

Figure 5b



## DISCUSSION

Osteoid osteoma is a benign osteoblastic lesion characterized by a well-demarcated core (nidus) usually less than 1 cm in diameter and by a distinctive surrounding zone of reactive bone formation (1,2).

It mainly occurs in the extra-articular portions of the long bones of the lower extremity in approximately 80 % of cases. However, the lesions also occur in the upper extremity. Juxta-articular osteoid osteoma has rarely been described in the literature and there are only a few reports of elbow joint location and only eight cases in the proximal ulna (3,4,5,6).

The case reported here is the first that we are aware of in which the subperiosteal osteoid osteoma was located in the coronoid process tip.

The benign tumour was classified into 3 types by Edeiken et al (6): cortical, medullary, and subperiosteal. Cortical lesions are the most common. In our case the lesion was subperiosteal. In this unusual juxta-articular location osteoid osteoma provokes specific physiopathological, clinical and radiographic concerns. The most significant consequence is the induced synovitis. Moreover, synovitis slowly leads to cartilage destruction, which causes a definitive osteoarthritis

when the diagnosis is delayed.

This tumor does not have the classical clinical and radiographic features seen in extra-articular locations. Atrophy of muscle, localized swelling, tenderness and stiffness are frequent findings.

The non-specific symptoms led to significant delay in diagnosis. The extreme variety of previous diagnoses at referral reflects the problem of differential diagnosis (7, 8).

On plain radiographs, an osteoid osteoma appears as a well-circumscribed round or oval lesion with a radiolucent nidus. Extensive reactive sclerosis around cortical lesions may obscure the central nidus. In subperiosteal location, radiographic changes in bone are absent or very limited. The absence of the bone sclerosis which is typical of cortical osteoid osteoma explains this. After a prolonged period of symptoms, the plain radiographs often showed extensive periosteal reaction and cortical thickening, which made it difficult to discern the small nidus (9, 10).

Most osteoid osteomas are clearly seen on CT-scan, and this should be the next study obtained in the work-up after plain radiographs. There are few reports of negative bone scans in histologically documented osteoid osteomas. CT scan is the best imaging modality to delimiting the actual nidus (3).

MRI may then provide additional signals like bone edema, effusion and synovitis in the joint.

In regard to the choice of treatment the success depends on the precise identification of the lesion. The tumor must be located using the CT scanner in order to define the size of the lesion and program either the total excision en bloc of the nidus, the percutaneous removal, or the use of radiofrequency.

Once the lesion has been localized, the problem still remains as to the optimal method of removal, considering where the tumour lies. In our case, the lesion was in proximity to important neurovascular structures (median nerve and brachial artery) and the articular cartilage. Once a decision was made to fully remove the lesion without injuring or involving any proximal structures we evaluated the following therapeutic hypothesis: Percutaneous resection with the K-wire under CT guidance. The procedure causes local destruction without preserving the pathologic tissue for a histological examination, and sometimes the procedure has to be repeated. Some reports refer to complications associated with this type of procedure, such as cutaneous

necrosis and skin burns, neuropraxia, osteomyelitis and fractures. Percutaneous ablation by means of radiofrequency causes a spherical bone necrosis of approximately 1 cm, around the area in which the thermo coagulator is placed. In our case, radiofrequency coagulation for a juxta-articular osteoid osteoma is not recommended because of the possibility of thermal cartilage destruction and making it impossible to carry out a histological examination (11).

The classical en bloc resection represents the only technique that can guarantee a histological diagnosis even though it requires a bigger bone excision than the lesion itself, which will then necessitate, according to the location, a bone transplant or osteosynthesis. We decided to use the en bloc resection technique because it would allow us to make a selective resection with a minimal incision, after having positioned the K-wire under CT guidance.

Because the lesion was in sub chondral area, after the resection we filled the bone defect. The execution of a precise excision enabled us to precisely calculate the defect, thus allowing us to obtain a press-fit graft. The graft was harvested from the olecranon. Furthermore, it must be taken into consideration that by selecting the olecranon as the harvest site, we safeguard the patient from risks associated with a graft from the iliac crest.

## CONCLUSION

Juxta articular sub periosteal osteoid osteoma in the elbow is rare and unusual benign tumour. It provides a diagnostic challenge because of the non specific clinical and radiological findings.

CT-scan is the best supplement to clinical and radiological examination and is useful both for diagnostic and for exact localized of the nidus.

The choice of therapeutic should represent a correct compromise between a complete excision of the lesion and saving the articular structures.

## CORRESPONDENCE TO

Hichem MNIF : Assistant Professor of Orthopaedics  
Department of Orthopaedics - Monastir – Tunisia E-Mail  
address: mnif\_hich@yahoo.fr Telephone: 00216 20 289 864

## References

1. Dorfman H.D and Czerniak B. Benign osteoblastic tumors. In: H.D. Dorfman and B. Czerniak, Editors, Bone tumors, Mosby, St Louis; 1998.p. 85-127.
2. Spiteri V, Aslam N, and Gatt R. Osteoid osteoma of the radial tuberosity presenting as lateral elbow pain. J Shoulder Elbow Surg 2006; 15, e5-e7.
3. Becker Paul L, Barrett Heywood III H, and Crosby Lynn A. Osteoid osteoma of the coronoid process: Case report and review of the literature. J Shoulder Elbow Surg 2000; 9: 446-8.
4. Dzupa V, Bartonicek J, Sprindrich J, Newirth J. Osteoid osteoma of olecranon process of ulna in subchondral location. Arch Orthop Trauma Surg 2001; 121: 117-118.
5. Le Huec JC, Lesprit E, Moinard M, Le Rebeller A. Osteoid osteoma of the elbow. J Shoulder Elbow Surg 1998; 7: 160-3.
6. Ediken J, DePalma AF, Hodes PJ. Osteoid osteoma (Roentgenographic
7. Clin Orthop 1966; 49: 201-6.
8. Tounsi N, Trigui M, Ayadi K, Kallel S, Boudaouara Sallemi T, Keskes H. Ost?me osteoide de l'ol?rane. Rev Chir Orthop 2006; 92, 495-498.
9. Weber K.L and Morrey B.F. Osteoid osteoma of the elbow: A diagnostic challenge, J Bone Joint Surg Am 1999; 81: 1111-1119.
10. Brabants K, Geens S, Van Damme B. Subperiosteal juxta-articular osteoid osteoma. J bone joint surg (Br) 1986; 68-B: 320-24.
11. Cassard X, Accadbled F, De Gauzy J Sales and Cahuzac J.P. Osteoid osteoma of the elbow in children: A report of three cases, and a review of the literature. J Pediatr Orthop Part B, Vol.11 No.3; 2002: 240-44.
12. Nourissat G, Kakuda C, Dumontier C. Arthroscopic excision of osteoid osteoma of the elbow. Arthroscopy 2007; 23 (7): 799.e1-4.

**Author Information**

**Hichem Mnif**

Assistant Professor of Orthopaedics, Department of Orthopaedics

**Mohamed Habib Kammoun**

Specialist, Department of Orthopaedics, El Alya Clinic

**Makram Zrig**

Assistant Professor of Orthopaedics, Department of Orthopaedics

**Mustapha Koubaa**

Professor of Orthopaedics, Department of Orthopaedics

**Abderrazek Abid**

Professor and head, Department of Orthopaedics