

**CASE REPORT**

# Elbow Stiffness Secondary to Elbow Joint Osteoid Osteoma, a Diagnostic Dilemma

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**Abstract**

We present a 23-year-old man with distal humerus osteoid osteoma referring to our hospital with pain and progressive stiffness. The patient has been suffering from the disease for two years without a certain diagnosis. The radiographies of elbow did not reveal the pathology but further CT scan and MRI studies demonstrated the tumor. The en block resection of the tumor resolved the pain immediately but range of motion remained restricted.

**Key words:** Elbow, Elbow stiffness, Osteoid Osteoma

**Introduction**

Osteoid osteoma was first described by Jaffe in 1935 as a benign osteoblastic tumor which produces severe pain (1). It usually involves metaphyseal diaphyseal junction of long bones with lower limb predominance (2). Clinically it presents with dull or aching pain that accentuates at night and is not related to physical activity. The pain is commonly alleviated by nonsteroidal anti-inflammatory drugs (NSAIDs) (3,4). It is more common in second and third decades of life and more commonly affects men, with an approximate male to female ratio of 2 to 1 (3-5). The diagnosis can be difficult and gets even more challenging if it involves unexpected anatomical areas. Sometimes uncommon juxta or intra-articular involvement which could involve any joint makes it difficult to be diagnosed (4-6). Delay in treatment is common as the diagnosis can be confusing especially in uncommon site involvement (3). The reason is the absence of classical diagnostic hallmarks clinically and radiographically. This delay of treatment can impose unacceptable cost and time waste and may lead to patient exhaustion.

We present our case of atypical osteoid osteoma of distal humerus with progressive stiffness and unspecific radiographical findings emphasizing that one needs to be highly suspicious of the disease to make the right

diagnosis and it should always be reminded as one of the possibilities in unexplained elbow pain and stiffness.

**Case report**

A 23-year-old man with severe non-traumatic right elbow pain and decreased range of motion was referred to our clinic. He had been suffering the symptoms for two years. The pain began insidiously and increased over six months before admission. The patient described the pain radiating up and down the elbow. The pain increased over the time and was persistent with nocturnal aggravations interfering with patient's sleep. He mentioned NSAIDs would temporarily relieve the pain and he could not go asleep without taking them. The patient was otherwise healthy, and had no other accompanying symptoms such as weight loss and nocturnal sweating.

On physical exam, the overall appearance of the elbow looked normal. The joint was stable with no palpable mass and effusion. There was moderate local anterior tenderness in front of the elbow with marked atrophy of the muscles. The elbow flexion-extension range of motion was restricted to 30 to 90 degrees but supination and pronation were normal compared to the non-affected side and wrist and shoulder movements were fully preserved. There was not any neurovascular deficit.

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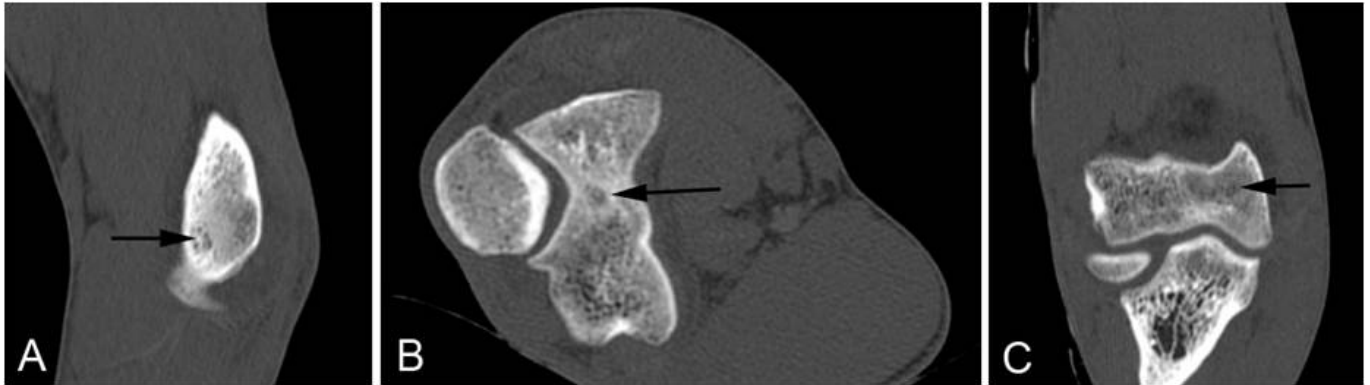


Figure 1. Sagittal (A) axial (B) Coronal (C) demonstrating nidus and surrounding sclerosis.

The plain antero-posterior and lateral radiographies of elbow did not add much to our findings. We obtained a CT scan of the involved elbow which revealed a 6 mm radiolucent lesion with a nidus at the center surrounded by thickening of adjacent cortex located at anteromedial of distal humerus [Figure 1]. The patient had an MRI which suggested bone edema, synovitis and mild joint effusion. The bone scan revealed focal uptake of radioisotope compatible with the location of the lesion in CT scan [Figure 2]. Laboratory investigations including the C-reactive protein, sedimentation rate and electrolytes were normal. The EMG-NCV studies were normal as well.

After making the diagnosis of osteoid osteoma based on clinical examination and radiographic findings, the patient was scheduled for operation to excise the lesion. Under general anesthesia the elbow joint was approached anteromedially, the ulnar nerve was explored, the neurovascular bundle was retracted laterally and elbow arthrotomy was performed. At the

time of arthrotomy, about four ml of clear joint effusion was drained. Synovial hypertrophy was obvious in the joint. The anteromedial aspect of distal humerus was exposed. An abnormal bony protuberance was clearly noticed. A part of the cortex was removed using oscillating power saw, there was significant sclerosis at the site and the interior was evacuated by curettage and all were sent for pathological study [Figure 3]. No graft was used to fill the cavity. Post operative histological examination confirmed the diagnosis of osteoid osteoma [Figure 4].

The patient reported a prompt pain relief just the day after surgery. Elbow physiotherapy was started in the first week after operation. The patient achieved 20 to 120 arc of motion three months after operation (Figure 5). He returned to full activity and no postoperative complication reported two years after operation. In the last follow-up radiographies, the defect was filled completely.

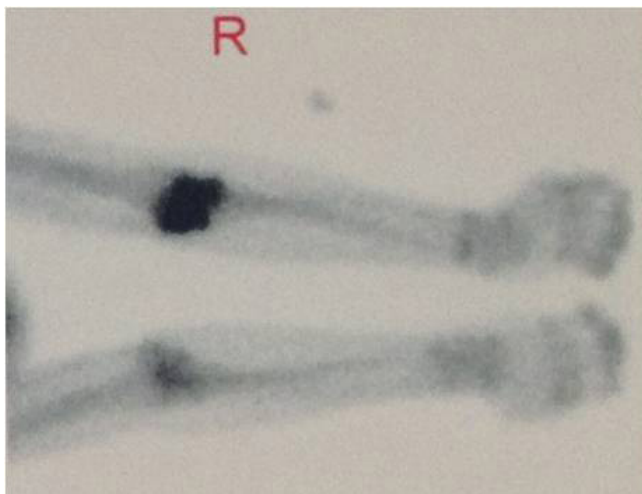


Figure 2. Intense uptake of radioisotope corresponding to the site of radiographic abnormality, which is consistent with osteoid osteoma.

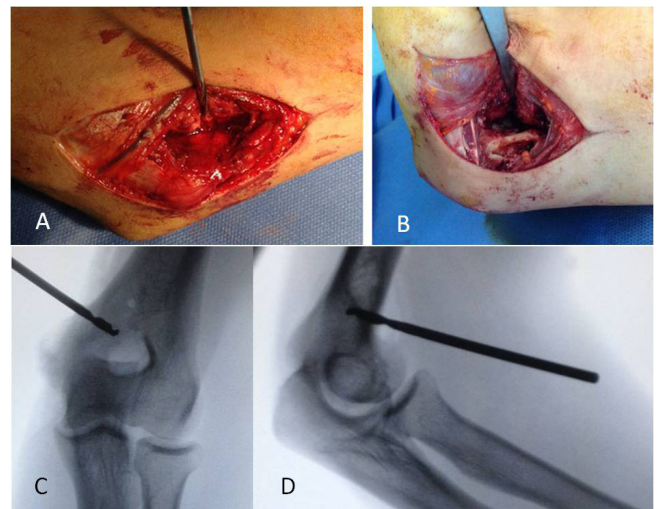


Figure 3. (A) Intraoperative localization of the lesion (B) Bone cavity after excision and evacuation of the involved area. (C) Anteroposterior and (D) lateral view localizing the lesion taken by C-arm intraoperatively.

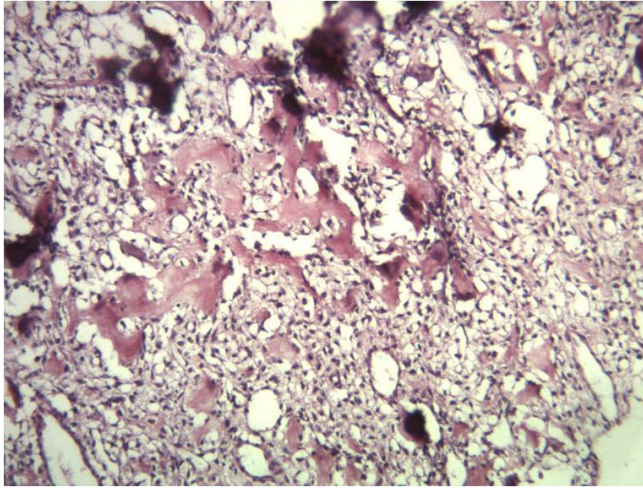


Figure 4. Histology of intraoperatively resected bone.

### Discussion

Due to their rare appearance and unspecific symptoms, intra-articular osteoid osteomas of the elbow joint are often diagnosed with delay (5). The delay to make a correct diagnosis may take several months or even more than two years and in some series it is reported up to 10 years (3,5). In the literature elbow osteoid osteoma was mistaken to other diseases such as tennis elbow, tuberculous synovitis, rheumatoid arthritis, ulnar or radial nerve entrapment, hemarthrosis, and post traumatic periosteitis (3,4,6-9). Diagnosis would be more challenging if there was a history of confounding factor, such as a previous injury, or chronic diseases such as hemophilia (3,9,10). Several times, these patients have been uncritically operated with unsuccessful arthroscopy, ulnar nerve transfer, radial nerve release, or lateral epicondylitis release in past (4-6,9). In a study by Otsuka et al., four out of six patients with the final diagnosis of elbow osteoid osteoma had unrelated surgeries before diagnosis (4).

Clinical manifestations are different in elbow osteoid osteoma with typical diaphyseal ones. Chronic pain is the main presentation of all the patients suffering from elbow osteoid osteoma (4,5). Similar to our patient, pain sometimes radiating down to the forearm (10). The pain is usually less severe, and the response to NSAIDs is less dramatic than in the diaphyseal lesions (5,7,11). Elbow flexion-extension restriction is the second more important finding as it was more predominant than pain in our patient. Elbow stiffness was detected in 50% to 100% of elbow osteoid osteomas (4,5). Pronation and supination are rarely affected (5,10). atrophy of muscle, localized swelling, and tenderness are other frequent findings (8).

Plain radiographies are not usually helpful in detecting elbow osteoid osteoma. On plain radiograph, a diaphyseal osteoid osteoma appears as a well-circumscribed round or oval lesion with a radiolucent nidus surrounded with reactive sclerosis. However, in elbow osteoid osteoma Initial plain radiographs have not been diagnostic in 83%



Figure 5. (A) Preoperative photo of patient's elbow range of flexion-extension (B) elbow range of motion three months after surgery.

to 100% of patients (3,5,9,10). Since half of the elbow osteoid osteomas are located in olecranon fossa, accurate evaluation of this parts may help to increase the tumor detection (12).

Most osteoid osteomas are clearly seen on CT scan, as it is the best imaging modality to define the actual nidus (5,12). The so-called feeding vessel, a distinctive finding in osteoid osteoma, was apparent in half the cases on CT scans (5). CT scan is also helpful to define the size of the lesion and program the removal procedure (6).

A constant finding on MRI scan is a marked bone marrow oedema corresponding to the highly vascularised mesenchymal tissue which reported to be observed in all patients (3,5,7). So, an otherwise unexplained bone marrow oedema can be interpreted as a red flag and should prompt further examination by CT imaging (5). There are some concerns related to over-estimation of the bone pathology in MR imaging that some authors do not advise it for diagnosis of osteoid osteoma (3). However, in elbow osteoid osteomas, it helps to identify co-existed synovial proliferation and joint effusion.

Although a double-ring sign on scintigraphy is a characteristic of osteoid osteoma, focal uptake of radioisotope is the only finding in many cases as our reporting case (3).

Resection of the tumor was highly successful in terms of pain relief independent of the type of intervention (5). Regarding the choice of treatment, the success depends on the precise identification of the lesion (6). Since the diagnosis of elbow osteoid osteoma is usually made with delay and sustaining symptoms may lead to joint stiffness, synovitis and further osteoarthritis, prolonged treatment with NSAIDs is not recommended (9,10,13,14).

Both percutaneous resection with the K wire under CT guidance and percutaneous ablation by means of radiofrequency cause local destruction without preserving the pathologic tissue for histological examination. Some

reports refer to complications associated with these procedures such as cutaneous necrosis, skin burns, neuropraxia, osteomyelitis, fractures, and thermal cartilage damage (15-18). Therefore, we have chosen the classical en bloc resection as it is the only technique that can guarantee a histological diagnosis even though it requires a bigger bone excision.

This study emphasizes the importance of including osteoid osteoma as a differential diagnosis of elbow pain and stiffness. The key points such as young age, pain features, accurate evaluation of radiographies and further examination by CT imaging or bone scan could help the surgeon to obtain the diagnosis without delay. Although the pain is resolved immediately after successful surgical resection, surgery does not guarantee full range of motion return.

Osteoid osteoma of the elbow can be a misleading entity.

For a young patient with elbow stiffness and pain without history of trauma or inflammatory diseases, osteoid osteoma of the elbow should be strongly considered.

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