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Case report

Osteoid osteoma of the rib: A report of an extremely rare condition

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ABSTRACT

Introduction: Osteoid osteoma (OO) is a type of benign bone tumor that usually affects long bones of the lower extremities. In this case report, we describe a successful surgical resection of an OO located in the rib which is an extremely rare location.

Case presentation: This is a 23-year-old man, referred to our thoracic surgery department for a very intense nocturnal right chest pain for over two months, the physical examination was normal without clinically palpable chest mass. The CT scan showed an osteocondensing lesion at the junction of the middle and posterior arches of the right 6th rib suggesting Ewing's sarcoma, a PET CT was then requested showed an appearance of a regular non-hypermetabolic inhomogeneous condensation at the junction of the middle and posterior arcs of the 6th right rib. After multidisciplinary concertation, a CT-guided biopsy of the lesion was performed, the histological examination of which revealed an osteoid osteoma, then a complete resection of the lesion was performed under posterolateral thoracotomy which histology confirmed a costal osteoid osteoma. The patient is currently in good health condition with complete disappearance of chest pain after one month of the operation and does not present any complications for the long-term follow-up.

Discussion: Osteoid osteoma (OO) is a benign primary bone tumor with unknown pathogenesis. That occurs in patients during the first two decades of life in about 60 to 75% of cases with a strong predilection for long bones, in 60 to 70% of cases. Flat bones, such as the skull, jawbones, innominate bones, and ribs are rarely described (McDermott et al., 1996 [1]). The standard treatment for OO is complete surgical excision, which is offered to the patient when the pain is chronic and not relieved by medical treatment (Osteoid osteoma: the results of surgical treatment [Internet] [2]).

Conclusion: The osteoid osteoma of the rib is a very rare entity of bone neoplasms, this is the first case in our department that demonstrates that the OO of the rib must be suspected affront any painful rib and that complete surgical excision when it's possible, is a safe and effective treatment.

1. Introduction

Osteoid osteoma (OO) is a benign and painful bone tumor in which rib localization is extremely rare with a prevalence of less than 1% of all rib tumors and comprising 5% to 7% of all primary bone tumors [3–5]. This case report describes a case of an OO located in the rib and completely resected under posterolateral thoracotomy in a 23-year-old man. The patient was diagnosed and managed in our institution; a tertiary referral university teaching hospital. This work has been reported in line with the SCARE 2020 criteria [6].

2. Case presentation

This is a 23-year-old man, referred to our thoracic surgery department for a very intense nocturnal right chest pain measured at 08/10 according to the visual analog scale (VAS) over two months, and the physical examination found a patient in good condition and normal vital signs, without clinically palpable chest mass. The CT scan (Fig. 1)

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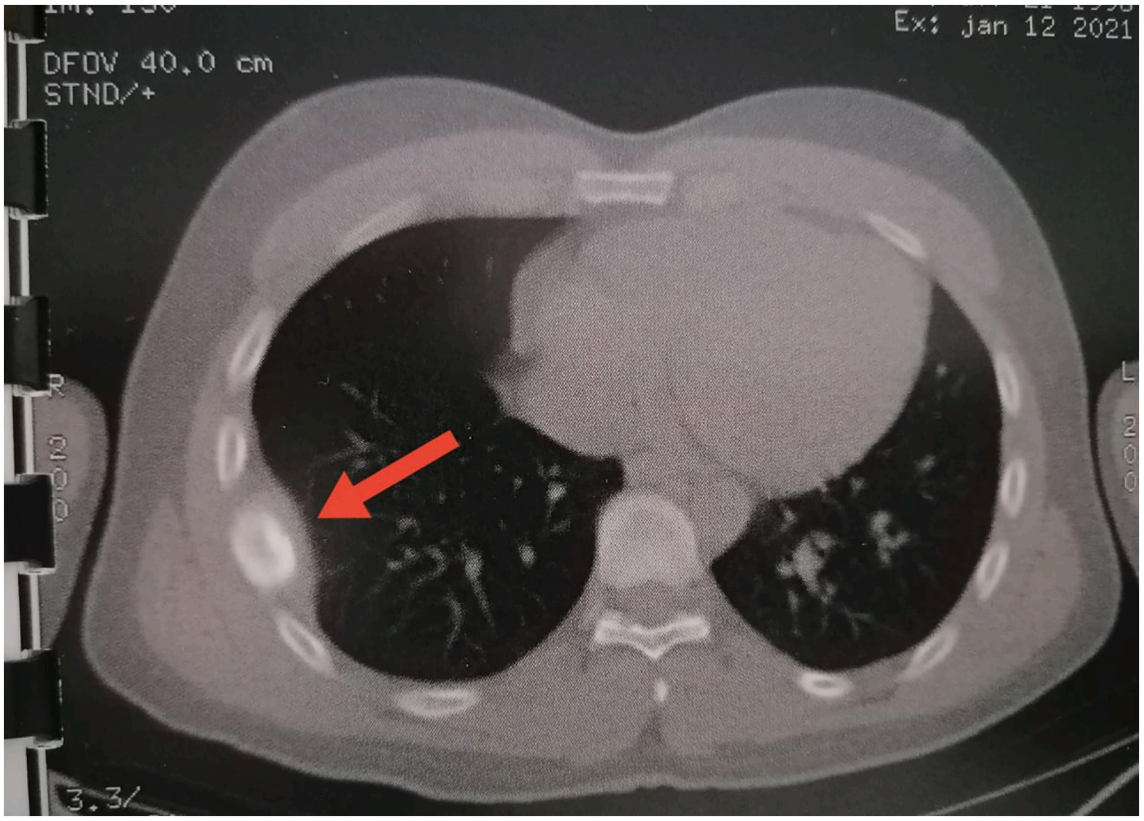

Fig. 1. CT scan: osteocondensing lesion at the junction of the middle and posterior arches of the right 6th rib suggesting Ewing's sarcoma.

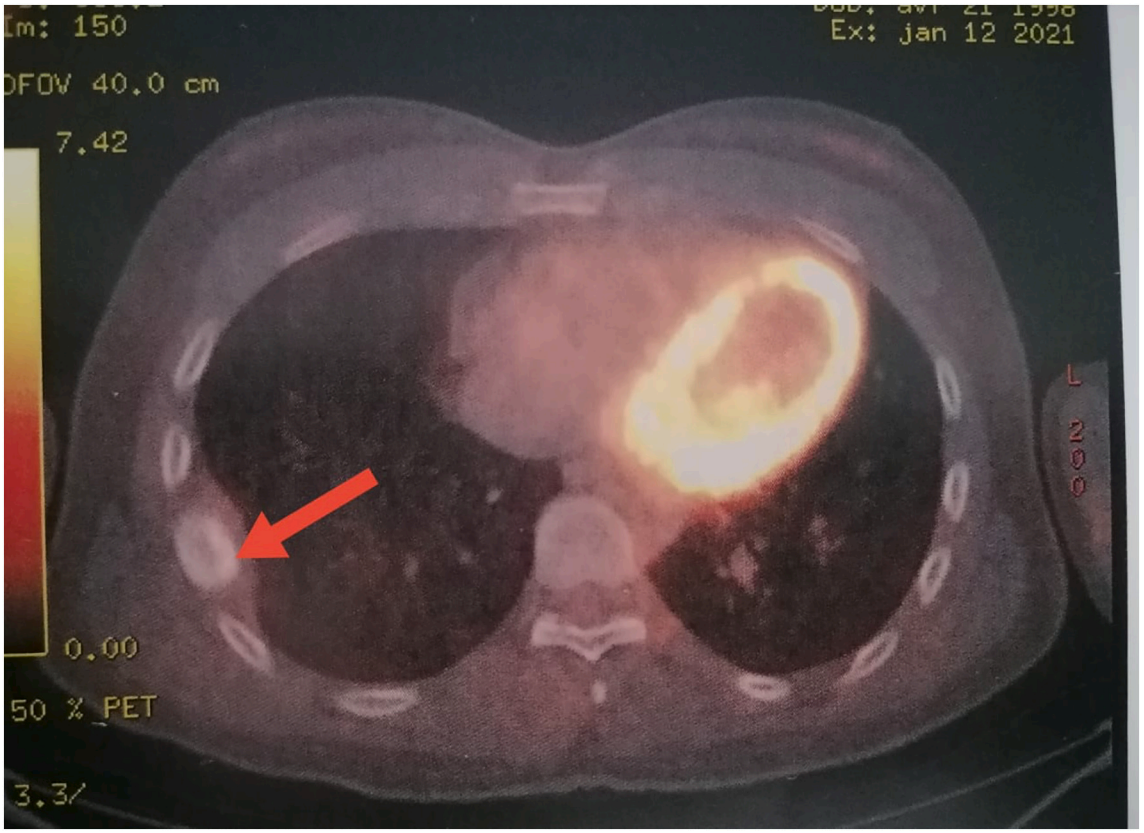

Fig. 2. PET CT: A regular non-hypermetabolic inhomogeneous condensation at the junction of the middle and posterior arcs of the 6th right rib.

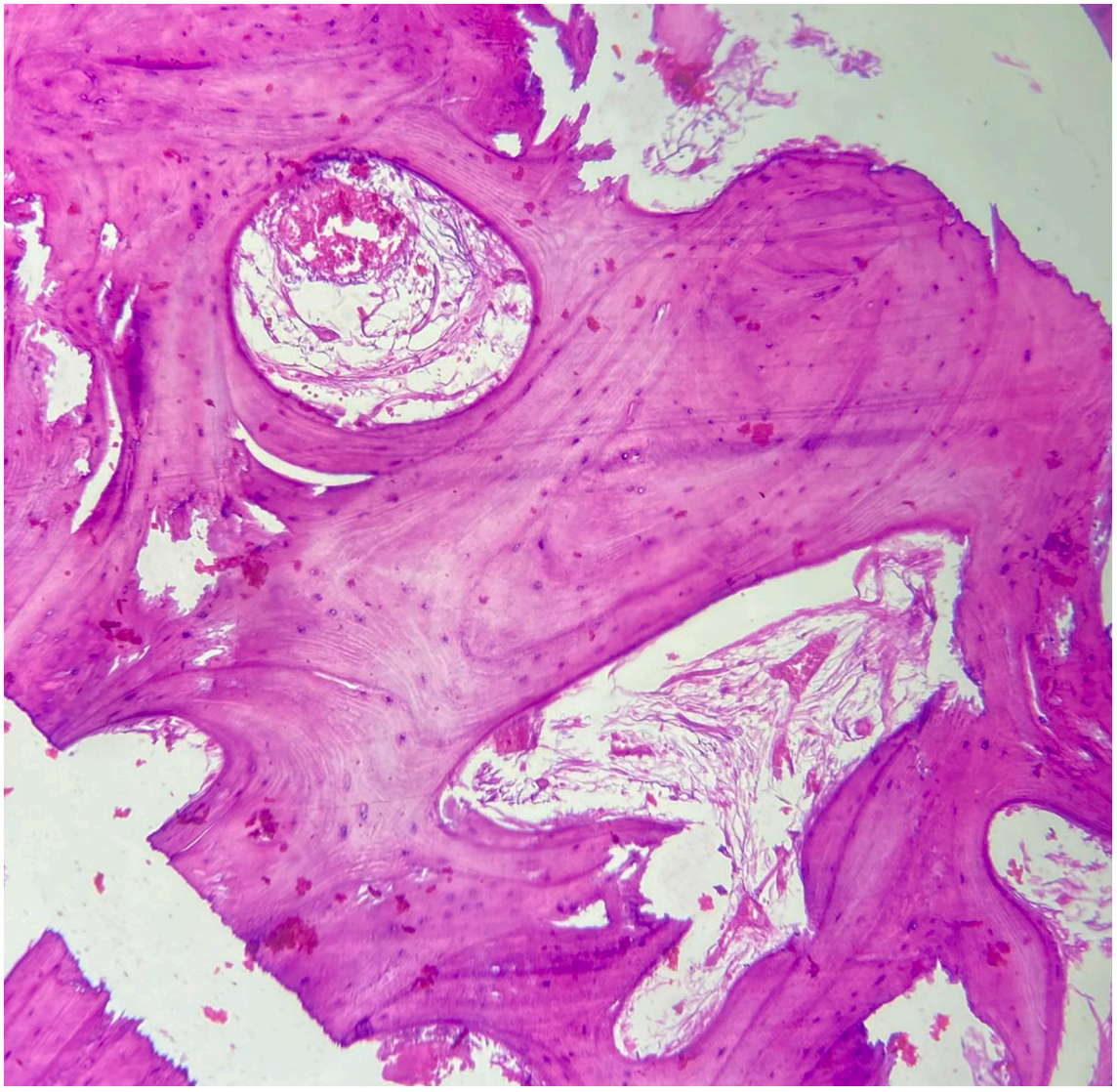

Fig. 3. Specimen: Anterior and posterior view.

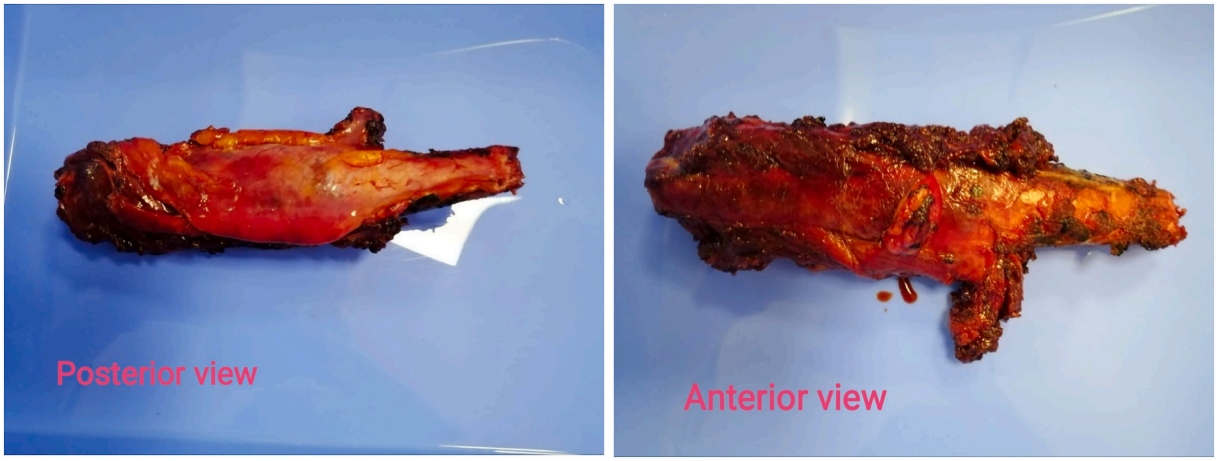

Fig. 4. Histopathology: The specimen is composed of compact, mature, lamellar bone with well-developed Haversian canals. (H&E, magnification ×100).

showed an osteocondensing lesion at the junction of the middle and posterior arches of the right 6th rib suggesting Ewing's sarcoma, a PET CT (Fig. 2) was then requested showed an appearance of a regular non-hypermetabolic inhomogeneous condensation at the junction of the middle and posterior arcs of the 6th right rib. After multidisciplinary concertation, a CT-guided biopsy of the lesion was performed, the

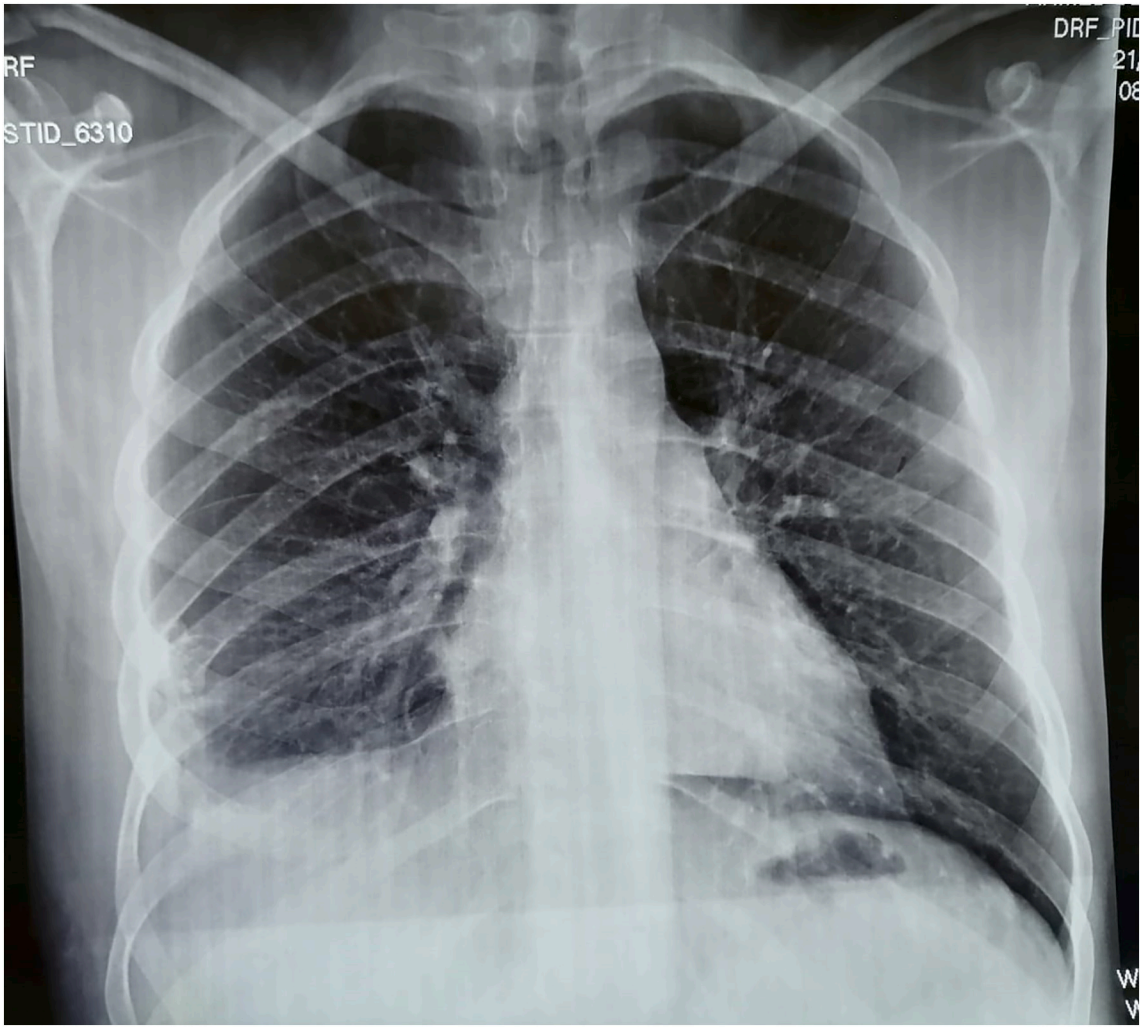

Fig. 5. Control chest X-ray one month after surgery.

histological examination of which revealed an osteoid osteoma, and then the complete resection of the lesion was performed under posterolateral thoracotomy which histology confirmed a costal osteoid osteoma (Figs. 3 and 4). The patient is currently in good health condition with complete disappearance of chest pain after one month of the operation and does not present any complications for the long-term follow-up (Fig. 5).

3. Discussion

Primary rib tumors are very rare, constituting only 5–7% of all primary bone neoplasms [7]. Osteoid osteoma (OO) is a benign primary bone tumor with unknown pathogenesis. That occurs in patients during the first two decades of life in about 60 to 75% of cases with a strong predilection for long bones, in 60 to 70% of cases. Flat bones, such as the skull, jawbones, innominate bones, and ribs are rarely described [1].

The most common types of tumors that affect the ribs are metastases and myelomas. Primary tumors of the ribs are uncommon. Therefore, the location of a tumor within the rib may help establish a differential diagnosis. Cartilaginous tumors frequently occur close to the costochondral junction, while rib sarcomas are more likely to present with symptoms of pain [8].

OO is diagnosed by the combination of both typical clinical pictures and imaging findings. The main symptom of this pathology is nocturnal pain which can be relieved by non-steroidal anti-inflammatory drugs (NSAIDs) and salicylates. The CT is considered the modality of choice for OO, as the nidus can be obscured on radiographs. Te central calcification may be punctate, amorphous, or ring-like, and it is usually regular and centrally located. On CT scans, a “vascular groove” or “CT vessel” sign can be identified, represented by low-density grooves entering the nidus and corresponding to the enlarged vessels that arise from the periosteum to irrigate the hypervascular nidus [9].

The differential diagnosis of painful rib lesions should consider bone tumors. Aneurysmal bone cysts of the posterior vertebral elements, eosinophils granulomas, and osteoid osteomas are the most common. Due to the characteristic symptoms and the presence of the nidus on the scanner, the diagnosis of other Painful rib neoplasms was excluded in our case report [10].

The standard treatment for OO is complete surgical excision, which is offered to the patient when the pain is chronic and not relieved by medical treatment [2].

4. Conclusion

Osteoid osteoma of the rib is a very rare entity of bone neoplasms, we demonstrate through this case report that OO of the rib should be suspected in cases of any painful rib without a history of trauma and which complete surgical excision when possible is a safe and effective treatment.

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Ethical approval

As per international standard, written ethical approval has been collected and preserved by the author(s).

Consent

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Author contribution

This work was carried out in collaboration among all authors. Authors NI, SH designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors NI, SH and SB managed the analyses of the study. Author SH managed the literature searches. All authors read and approved the final manuscript.

Research registration

1. Name of the registry: HAFIDI SARA
2. Unique identifying number or registration ID: 0000-0002-4078-4001
3. Hyperlink to your specific registration (must be publicly accessible and will be checked):

Guarantor

Dr. Sara HAFIDI.

Declaration of competing interest

The authors disclose no conflicts.

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None.

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