



Unusual Presentation of a Rib Osteochondroma as Hard Breast Lump in a Young Male: A Case Report

젊은 남성에서 딱딱한 유방 덩이로 만져진 갈비뼈 골연골종의 드문 증상: 증례 보고

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Osteochondroma arising from the rib is rare. They arise as bony outgrowths from the rib and extend either extrathoracically into the subcutaneous plane or intrathoracically compressing the lung or mediastinal structures. A 23-year-old male patient presented with complaints of breast lump since last year. On clinical examination, a hard bony projection with lobulated contour was palpable. Chest radiograph and contrast-enhanced CT showed a bony outgrowth arising from the anterior aspect of costochondral junction of the right fourth rib with displacement of pectoralis major muscle anteriorly. Osteochondroma should be considered as a differential diagnosis in the presentation of hard lump in the breast along with other chest wall tumors.

Index terms Rib; Osteochondroma; Gynecomastia; Breast

INTRODUCTION

Osteochondromas are benign cartilage-capped bony outgrowths that usually arise from the metaphysis of long bones around the shoulder, hip, knee and are seen in continuity with the periosteum (1). They account for 10%–15% of all bone tumors and 20%–50% of benign bone tumors. Osteochondroma of the rib is rare, with a reported incidence of 2%–8%. Jilowa et al. (1) described a large dumb-bell-shaped rib osteochondroma presenting as chest wall

mass with both intrathoracic and extrathoracic extensions closely abutting the mediastinal structures with maintained fat planes. Kadu et al. (2) described a small osteochondroma arising from the lateral aspect of the right 6th rib presenting as a chest wall mass. Rib osteochondromas presenting as chest wall swelling/masses were rare and were described in 2 previous reports. To the best of our knowledge, there were no cases related where rib osteochondroma presented as a breast lump in a male patient. In this case report, we describe an osteochondroma of the rib presenting as a hard lump in a male breast secondary to its unique location.

CASE REPORT

A 23-year-old male presented with a hard right breast lump that has gradually progressed in size over the past year. On visual inspection, unilateral gynecomastia was suspected, and on palpation, the breast lump was lobulated with hard stony consistency, was immobile, and firmly attached to the underlying chest wall. The skin over the swelling was stretched out without any erythema, tenderness, or ulceration and was movable. There was no history of trauma or surgery.

Antero-posterior and lateral chest radiographs showed a lobulated bony outgrowth from the right 4th rib anteriorly (Fig. 1A). Contrast-enhanced CT images showed an irregular, well-defined mushroom-shaped bony outgrowth arising from the right anterior aspect of the 4th rib at the costochondral junction towards the chest wall uplifting the pectoralis major muscle. The bony outgrowth shows continuity with the medullary cavity of the underlying parent rib and showed intact periosteum. No infiltration to adjacent soft tissue was noted. Reconstructed 3D volume rendered technique (VRT) images in various planes showed bony growth in direct continuity with the underlying rib (Fig. 1B-F) confirming the diagnosis of osteochondroma.

DISCUSSION

Osteochondromas are benign bone tumors that arise from the metaphyseal region of long bones or flat membranous bones as abnormal bony outgrowth with cartilaginous caps (2-4). It is more commonly considered a developmental anomaly than a true neoplasm (1). Most common locations are the metaphyseal regions of long bones such as the distal femur, proximal tibia, and proximal humerus, and flat bones of membranous ossification including ribs are less common sites. Osteochondromas can be solitary or multiple. Multiple osteochondromas of the rib in hereditary multiple exostoses (HME) may be associated with mutations in exostosin (EXT1) and exostosin (EXT2) genes and may present with abnormal growth and skeletal deformities. The bony outgrowths can be sessile or pedunculated and show continuity with the medullary cavity of the underlying parent bone. Males are more commonly affected than females, with a male to female ratio of 1.5:1.

Osteochondromas are usually first noticed within the 2nd decade and diagnosed within the 3rd decade of life and grow until skeletal maturity. Radiographs show metaphyseal bony outgrowths, particularly away from the epiphysis. The cartilaginous cap may sometimes show ring and arc calcifications. CT best visualizes cortical and marrow continuity with the native bone in osteochondromas and is useful for measuring cartilage cap thickness and

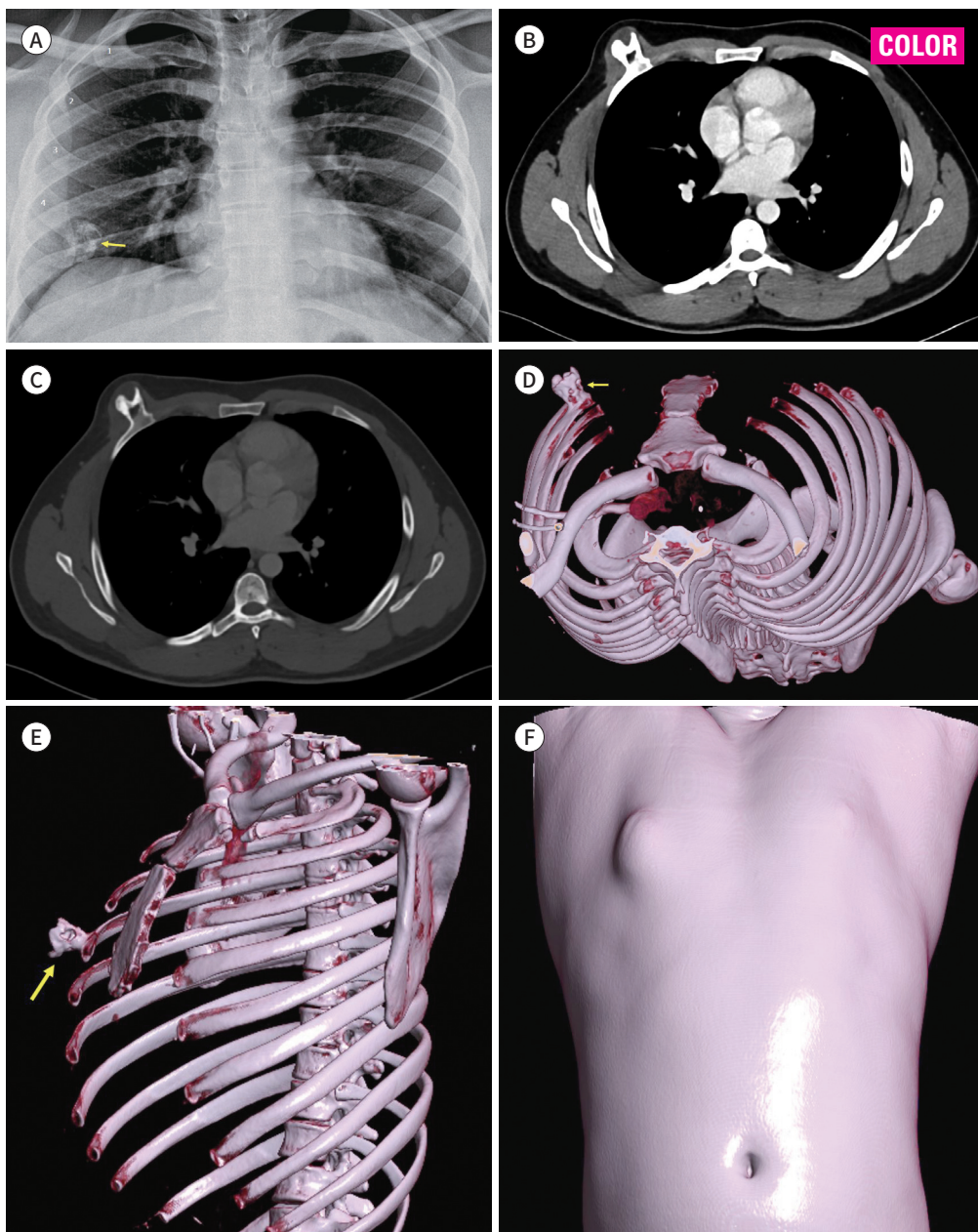
shows the non-mineralized cartilage cap as lower attenuation than adjacent muscle.

The risk of developing chondrosarcoma is rare. The reported prevalence of developing malignant transformation in solitary osteochondroma is less than 1%, and is higher in HME

Fig. 1. Rib osteochondroma, presented as hard breast lump in a 23-year-old male.

A-C. Chest PA (A) shows irregular, radiodense bony outgrowth overlying the anterior aspect of the right fourth rib (arrow). Contrast-enhanced CT axial mediastinal window (B) shows an irregular bony outgrowth arising from the anterior costochondral junction, aspect of the right fourth rib, uplifting the pectoralis major muscle anteriorly. Bone window axial (C) image shows the continuity of the bony outgrowth with the underlying rib medullary cavity.

D-F. Volume rendered technique axial and sagittal images (D, E) depict the bony outgrowth (arrows) from the right fourth rib. The shaded surface display (F) image shows swelling in the right chest, just below the nipple.



(5%–25%) (5). Risk of malignant transformation is more common in axial skeletal sites such as ribs, shoulder, pelvis, and spine (6). Pain, sudden or continuous increase in the size of the lesion after skeletal maturity raises suspicion of malignant degeneration. Imaging shows new cortical irregularity, an increase in the cartilage cap thickness, and sometimes frank aggressive features like bone destruction and soft tissue extension. An increase in the cartilaginous cap thickness of more than 3 cm is considered as an indicator of malignant transformation (2, 6-9).

Osteochondroma of rib protruding into the thoracic cavity and compressing the intrathoracic structures was described in a few studies; multiple osteochondromas were contacting the visceral pleura (6), large rib osteochondroma in a child extending to thoracic cavity replacing the left upper lobe and invading the mediastinum with extensive calcifications (8), rib osteochondroma protruding into the thoracic cavity compressing the ventricles of heart (9), rib osteochondroma compressing the right upper lobe apical lung parenchyma (10), osteochondromas of the rib causing pericardial thickening from continuous friction (3, 7), rib osteochondroma with bony projection into the thoracic cavity causing pneumothorax (4).

Asymptomatic osteochondromas are managed conservatively. Excision is indicated in cases with intrathoracic compression symptoms, chest pain, and aggressive features on imaging like cortical destruction, soft tissue extension, increased cartilage cap thickness, and rapid increase in size after skeletal maturity (10). Surgical treatment is usually wide local resection with negative tumor margins as they were prone to recurrence (8). Small rib osteochondromas with intrathoracic extension compressing the mediastinal structures can be excised by video-assisted thoracoscopy (9). In larger tumors, thoracotomy is usually preferred.

Rib osteochondromas are rare. They may be asymptomatic, and if arising from the outer aspect of the rib, they can present as either extra-thoracic chest swelling or a breast mass. It can be diagnosed on X-ray or ultrasonography, but CT helps to identify the underlying bony continuity better for confirmation of diagnosis apart from cartilage cap thickness and follow-up. This condition should be suspected as one of the differential diagnoses of a hard breast or chest wall mass with an overlying normal skin surface.

Author Contributions

Conceptualization, N.K.; data curation R.V.N., R.V.M.; formal analysis, N.K., R.V.N.; investigation, R.V.N., R.V.M.; methodology, N.K., R.V.M.; project administration, N.K.; resources, N.K.; software, R.V.N.; supervision, N.K.; validation, N.K.; visualization, N.K., R.V.N.; writing—original draft, R.V.N., R.V.M.; and writing—review & editing, N.K.

Conflicts of Interest

The authors have no potential conflicts of interest to disclose.

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젊은 남성에서 딱딱한 유방 덩이로 만져진 갈비뼈 골연골종의 드문 증상: 증례 보고

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갈비뼈에서 발생하는 골연골종은 드물다. 골연골종은 갈비뼈에서 자라서 흉부 밖으로는 피하로 확장되거나 흉부 안으로는 폐 또는 종격동 구조물들을 압박한다. 23세 남자 환자가 작년년부터 만져지는 유방 덩이를 주소로 내원했다. 임상 검사에서 소엽 모양의 단단한 뼈 돌기로 촉진되었다. 흉부 영상과 조영증강 CT에서 오른쪽 4번째 갈비뼈의 갈비뼈연골접합부의 앞쪽에 뼈의 과성장이 보였고 대흉근을 밀고 있었다. 유방의 단단한 덩이를 주소로 온 경우 다른 흉곽종양과 함께 골연골종이 감별진단에 포함되어야 한다.

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