



A rare case of chondrosarcoma at the posterior costovertebral junction: a case report

Lava Abdullah, MD^{a,*}, Sihaam Saleh Alsulaiman, MD^a, Obai Mustafa Alsalhani, MD^b, Ahmad Alkheder, MD^d, Ibrahim Ali Al-Sulaiman, PhD^c

Introduction: Chondrosarcoma is the third most common primary malignancy of the bone, it is considered the most frequent malignancy of the chest wall. Chondrosarcoma at the costovertebral junction is rare and few cases are described in the literature.

Case Presentation: The authors present a case of a 47-year-old female with a complaint of chronic pain in the right posterior upper chest, dyspnea, and episodes of dizziness. The diagnosis of low-grade chondrosarcoma at the posterior costovertebral junction was made by video-assisted thoracic surgery and computed tomography. The surgical management included resection of the tumor and parts of adjacent ribs.

Discussion: Chondrosarcoma is chemotherapy and radiotherapy-resistant. The total surgical excision of the tumor with sufficient margins is usually curative.

Conclusion: A follow-up is necessary because of the potential for recurrence.

Keywords: chondrosarcoma, costovertebral, numbness, pain

Introduction

Chondrosarcomas are the third most frequent primary malignancy of bone after myeloma and osteosarcoma. They are a heterogeneous collection of neoplasms that share the formation of cartilage matrix by the tumor cells. They account for 10% of malignant bone tumors^[1,2].

Chondrosarcomas, the most common malignant tumor of the chest wall, are better known for infiltrating the pelvis and extremities^[3].

De novo (i.e. primary chondrosarcomas) or through the malignant transformation of benign cartilage tumors like enchondromas or osteochondromas are two ways that chondrosarcomas can develop^[1].

Only less than 10% of all cases of chondrosarcomas occur in the spine, and the majority of them are found in the thoracic spine^[2].

Thoracic chondrosarcomas are usually diagnosed in the ribs (costal), ribs and sternum (costosternal), or the sternum (sternal).

^aDepartment of Obstetrics and Gynecology, ^bOrthopedic Surgery Department, ^cThoracic Surgery Department, Police Hospital and ^dOtorhinolaryngology Department, Al-Mowassat University Hospital, Faculty of Medicine, Damascus University, Damascus, Syria

*Corresponding author. Address: Al-Mazzah, Damascus, Syria. Tel.: +963 997 769 874. E-mail: Lava7abdullah@gmail.com (L. Abdullah).

Sponsorships or competing interests that may be relevant to content are disclosed at the end of this article

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Annals of Medicine & Surgery (2023) 85:3129–3132

Received 21 March 2023; Accepted 1 May 2023

Published online 10 May 2023

<http://dx.doi.org/10.1097/MS9.0000000000000821>

HIGHLIGHTS

- Consider serious causes of persistent patient complaint.
- Chondrosarcomas at the costovertebral junctions are rare.
- The optimal treatment for the costovertebral junction chondrosarcoma is surgical with wide margins excision.

and rarely raise from the posterior costotransverse junction (costovertebral)^[3–5].

Case presentation

A 47-year-old female presented to the hospital with a complaint of chronic pain in the right posterior upper chest which last for 2 years, with concomitants attacks of dyspnea and a dry cough. The patient revealed that she had episodes of dizziness without any triggers.

She has been known to be a nonsmoker and nonalcoholic, with no history of past surgery or malignancy. She was diagnosed with mitral valve regurgitation during her visit to the cardiologist 5 years ago. Family history is not contributory.

The physical examination revealed numbness and hypoesthesia at the T5–T6 dermatomal distribution, while the motor examination was intact with normal muscle strength and tonicity.

Imaging studies

A plain chest radiography showed a round hyper-density mass with central calcification. The mass is located at the right upper thorax (Fig. 1). The computed tomography (CT) of the chest revealed that the mass was centered at the right T5 and T6 costovertebral junction measuring 5 × 3 × 2.8 cm with internal and external calcification. The mass extended in the right thorax



Figure 1. A plain chest radiography, shows 5 × 4 cm radio-opaque mass at the upper lobe of the right lung, which needs further investigations.

with rib distribution. However, the lesion did not affect the T6 neuroforamen (Fig. 2).

Preoperative MRI showed a heterogeneous round mass, MRI T2 very high central intensity calcified portions. At the costo-vertebral junction extending to the right fifth thoracic neural foramen, without spreading to the right epidural space (Figs. 3,4).

Surgical procedure

The first operation was an excisional biopsy by video-assisted thoracic surgery.

Under general anesthesia and decubitus position, we placed a left double lumen endotracheal tube to make one lung ventilation. A 10 trocar was inserted in the sixth and fifth intercostal spaces at the posterior and median axillary lines, respectively.

The total mass was resected without ribs or vertebral bodies and sent for histopathological study, which revealed a low-grade chondrosarcoma.

The second surgical procedure (resection of the tumor):

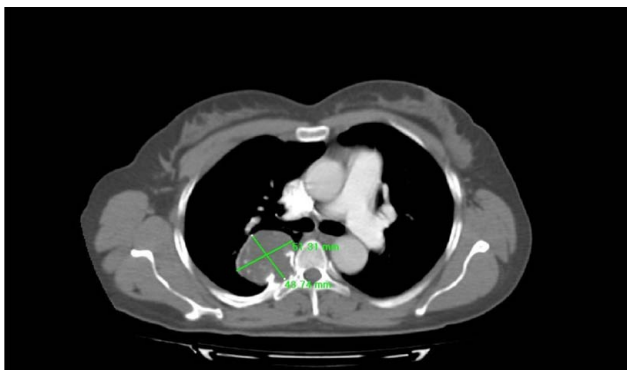


Figure 2. A thoracic axial plane computed tomography with contrast enhanced imaging (with mediastinal window) shows a heterogeneous mass at the right fifth–sixth costo-vertebral angle measuring 51–48 mm, 1 year preoperatively.

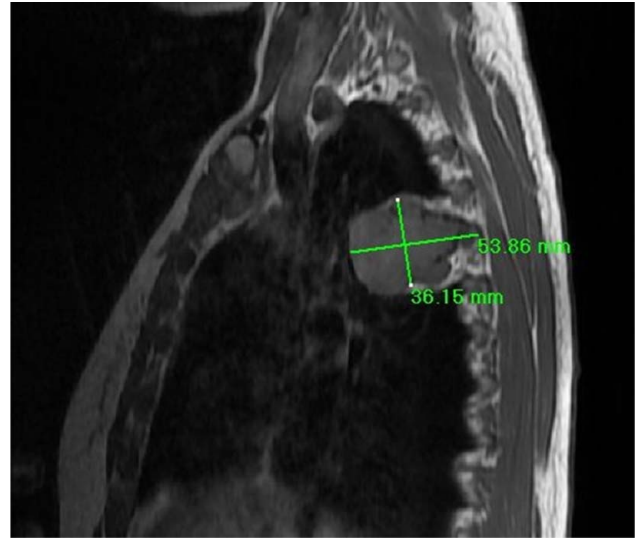


Figure 3. A thoracic sagittal plane T1 weighted magnetic resonance imaging show a heterogeneous mass at the right fifth–sixth costo-vertebral angle measuring 53–36 mm, 1 year preoperatively.

This second surgery was done 4 weeks after the video-assisted thoracic surgery.

The patient was placed in the prone position, under general anesthesia, and one-lung ventilation was done with ‘left double lumen endotracheal tube’. A right para median incision from the third to sixth intercostal spaces were made with a 15 blade. Then, the laminae of the fourth and fifth vertebra were exposed for laminectomy from the right side with their transverse processes.

Eventually, the spinal dorsal ganglion and the intercostal neurovascular bundle were resected completely.

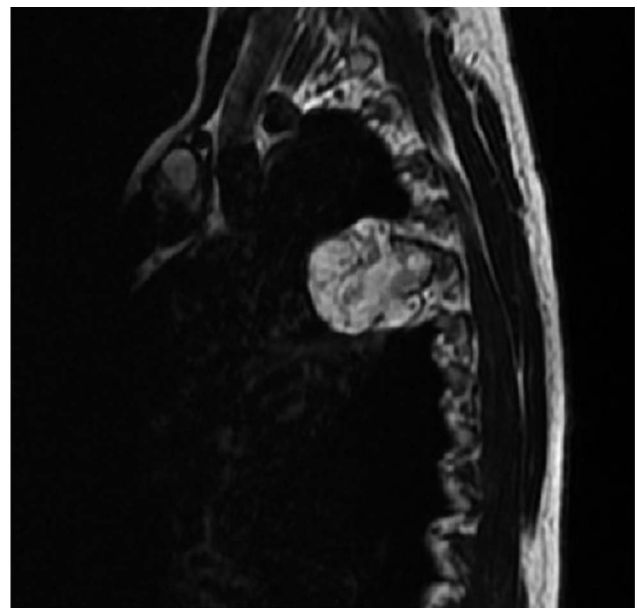


Figure 4. A thoracic sagittal plane T2 weighted magnetic resonance imaging show a heterogeneous mass at the right fifth–sixth costo-vertebral angle measuring 53–36 mm, 1 year preoperatively.



Figure 5. A plain chest radiography (posterior-anterior aspect) after total resection of the tumor with resection of the posterior body of the right fifth rib (fifth costovertebral resection).

A right posterior-lateral fourth intercostal incision was made before entering the thoracic cavity, and the pneumonolysis was done by investigating the entire thoracic cavity to examine any neoplastic tissues.

Then, excising nearly 5–7 cm of the ribs (fourth, fifth, sixth, and seventh), in addition to an extra 5 cm excision of the sixth rib as a safety margin.

After all, about ½ cm from each one of the (4, 5, 6, and 7) ribs was removed to send it as a separate sample for pathological study to confirm free margins (Fig. 5).

This case report was conducted in accordance with the Surgical Case Report (SCARE) criteria^[6].

Discussion

The insidious pain is the most common complaint among patients with chondrosarcoma^[4].

Therefore, chondrosarcoma should be included in the differential diagnosis of any patient presenting with chest wall pain and a visible mass on radiographic imaging.

Compared to chondrosarcomas in the pelvis and extremities, those that affect the chest wall are relatively rare. These tumors can develop in either the ribs or sternum, or even in both structures simultaneously. In some exceptional cases, chondrosarcomas of the chest wall may originate from the posterior costotransverse junction, as demonstrated in this our case report^[3,4].

Care must be taken to follow-up cases due to the possibility of recurrence. Recurrence had developed in 50% of patients who had local excision, compared to 17% of patients who had wide surgical resection. According to a study by McAfee, et al.(1985) which is one of the largest reported studies of chest wall chondrosarcomas, it included 96 patients with primary chondrosarcoma of the chest wall,

and with 10-year survival for patients treated with wide surgical resection was 96%, with local excision 65%, and with palliative excision 14%. The authors concluded that survival was influenced by tumor diameter, tumor grade, tumor location, and date of operation^[7].

The diagnosis of the tumor was initially done with a chest radiography, and to obtain more details CT and MRI were done.

MRI and CT are essential supplemental methods for enhancing tumor characterization^[8].

The optimal treatment is surgical with wide margins excision especially for grades 2 and 3^[1,9].

Radiotherapy and chemotherapy do not seem to affect the final result and it is generally used for palliative purposes only^[11,10,11].

Some studies have reported that radiotherapy can provide chondrosarcoma patients with excellent local control and symptom relief, indicating its survival advantage in chondrosarcoma.

Chondrosarcoma is a less malignant disease, with most patients survival of 10 years following standard therapy^[12].

It must be stressed on the need to treat such cases in sarcoma specialized centers, as some studies have reported that the survival rate is higher. In these specialized centers, compared to centers that are not specialized in treating such cases^[13].

The patient returned 1 year after surgery and had an MRI, which detected no tumor growth.

Collaboration between thoracic surgery and spine surgery may be necessary to get the best result, as costovertebral chondrosarcomas present an additional challenge to surgical resection, where extension to the thoracic spine can cause radiculopathy or myelopathy from nerve root or spinal cord compression^[9].

Recommendations:

1. Consider the serious causes of persistent patient complaint.
2. A chest radiography findings can be an important diagnostic key.
3. When there is no compromise in respiratory function, there is no need for thoracic cage reconstruction, especially in the posterior chest cage, in front of the scapula.
4. The basic step in the treatment of tumors with no indication for radiotherapy or chemotherapy, is wide resection with 4 cm free margins if possible.

Conclusion

These cases represent a challenge for surgeons because of the specificity of their anatomical location.

An accurate diagnosis requires a CT and MRI after the mass is detected. Chondrosarcoma should be included in the differential diagnosis of costovertebral junction masses and should be followed up due to the possibility of recurrence.

As previous studies concluded that the survival rate in chondrosarcoma of the chest wall is affected by its location, and given the scarcity of documented cases of chondrosarcoma arising from the posterior costotransverse junction; hence, we suggest and recommend that researchers in the future document similar cases and follow them up to reach a survival rate, recurrence, and prognosis for chondrosarcoma in this particular location.

Ethical approval

Ethical approval was obtained from the Ethical Research Committee in Police Hospital.

Consent

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

Sources of funding

No funding.

Author contributions

L.A., S.S.A., O.M.A., A.A., I.A.A.-S.: literature search and writing the manuscript. I.A.A.-S.: made the diagnosis and performed the surgery. All authors revised and approved.

Conflicts of interest disclosure

The authors declares that they have no conflict of interest.

Research registration unique identification number (UIN)

NA.

Guarantor

Lava Abdullah, Al- Mazzah, Damascus, Syria. E-mail: Lava7abdullah@gmail.com

Provenance and peer review

Not commissioned, externally peer reviewed.

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