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Clinical, Radiological and Histopathological Findings in Costo-chondral Junction Schwannoma: A Case Report

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Abstract: Costo-chondral junction Schwannomas are uncommon tumours of the chest wall that may arise from spinal roots or intercostals nerves. They usually present in young adults with painless chest wall mass. Not much literature is available about the description of costo-chondral junction schwannoma. Here we describe the clinical, radiological and pathological findings in a proven case of costo-chondral junction schwannoma.
Keywords: Schwannoma, Computed Tomography, Chest wall, Tumor.

INTRODUCTION

The rigid structure of the thorax includes vertebrae, sternum, ribs, and costal cartilage. The skin, connective tissue, thoracic and intercostal muscles, and pleural mesothelium constitute the soft tissues. These structures provide protection to the underlying thoracic viscera and support the respiratory process [1].

Chest wall tumors may be benign or malignant [1]. Benign chest wall tumors may be of vascular, peripheral nerve, cartilaginous, osseous, or adipose tissue origin. They are relatively uncommon and few research studies of these tumors have been reported. The assessment of these tumours is done by radiologic imaging, particularly for determining anatomic origin and extent, response to therapy and recurrence [2, 3]. The most common malignant entities include rib metastases and direct chest wall invasion from contiguous lung and breast carcinoma [1].

Schwannomas, although a common neoplasm, are relatively uncommon benign tumor of the costo-chondral junction. Not much literature is available about the description of costo-chondral junction schwannoma. In this case report, we describe the clinical, radiological and pathological findings in a proven case of costo-chondral junction schwannoma.

CASE REPORT

A 24 year old male presented to the surgeon with complaints of small lump in the right anterior chest wall since 2-3 months. The lump was slowly growing and painless. On examination, the lump was firm, non mobile, and mildly tender. Overlying skin was normal. X-ray chest was unremarkable. For further evaluation, computed tomography (CT) was advised. On non contrast CT, a well defined lobulated soft tissue density mass (white arrow), iso attenuating to muscle, was seen on right side displacing the chest wall muscles and intercostal vessels anteriorly (Fig. 1A). No bony erosion or destruction was seen. On post contrast images, intense homogeneous contrast enhancement (white arrow) was seen in the lesion (Fig. 1B). No necrosis or calcification was seen. A probable diagnosis of nerve sheath tumour or desmoid tumour was made. The lesion was surgically excised and sent for histopathological examination. Histopathological examination revealed cellular areas (Antoni A) and looser, myxoid regions (Antoni B) consistent with the diagnosis of schwannoma (Fig. 2).

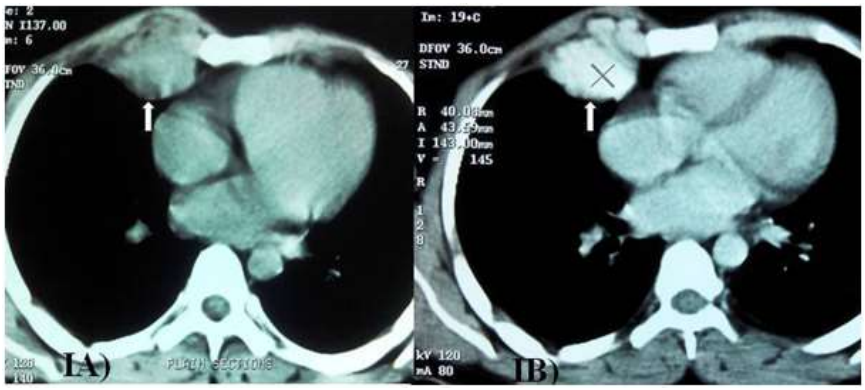

Fig. 1: A) Non contrast and B) Contrast enhanced CT scan of the thorax reveals a homogeneously enhancing lobulated soft tissue lesion (white arrows) on right side displacing the chest wall muscles and intercostal vessels anteriorly. No bony erosion or destruction is seen.

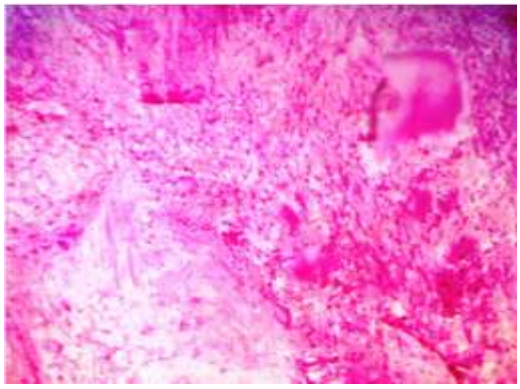

Fig. 2: Photomicrograph (haematoxylin-eosin, low power magnification) showing cellular areas (Antoni A) and looser, myxoid regions (Antoni B).

DISCUSSION

The musculoskeletal structure of the chest wall plays an important role in the protection of thoracic and mediastinal viscera providing integrity for respiratory function. The complex relationships of blood vessels, nerves, cartilage, bone and muscle allow the chest wall to serve its anatomic function [4].

Chest wall tumors are a heterogeneous group of lesions [4]. These tumors can vary from benign to malignant and arise from any soft tissue or bony structure. More than 50% of chest wall tumors are malignant [4, 5]. Chest wall tumours may be symptomatic or symptomatic, more than 20 % are found incidentally on chest radiograph [4, 6]. Pain is the presenting feature followed by an asymptomatic mass [4].

Schwannoma, although a common tumor, is a relatively uncommon lesion of the chest wall. They usually manifest clinically as a solitary, painless mass (often <5 cm) without neurologic symptoms [7, 8]. These are slow growing encapsulated tumours originating in nerve sheaths [9]. Chest wall schwannomas arise from spinal nerve roots and intercostal nerves and typically [10] occur in patients between 20 to 50 years of age [7]. Small tumors tend to be spheroid, firm, and well circumscribed whereas larger tumors are ovoid or irregularly lobulated [3].

X- Ray is the initial imaging modality in evaluation of Schwannomas. However many lesions remain obscured on x-rays.

On ultrasonography, a well defined oval or rounded hypo to isoechoic lesion is usually seen adjacent to neurovascular bundle. Associated calcifications or cystic changes may be seen.

CT enables precise assessment of tumor morphology, composition, location, and extent. It also provides an indication of the vascularity of a tumor.

On non enhanced CT, schwannoma appear as well-circumscribed homogeneous lesion with attenuation slightly less than or equal to that of muscle. On post contrast scans, the attenuation of the mass is equal to or slightly greater than that of muscle. Small tumors show uniform and bright enhancement while larger lesions appear more heterogeneous due to cystic changes. Associated bone scalloping may be seen and

indicates benign nature and slow growth rate of this lesion [3].

On histopathology, schwannomas show areas of moderate to high cellularity and scant stromal matrix (Antoni A) comprising of elongated cells with cytoplasmic processes arranged in fascicles along with less densely cellular areas consisting of loose meshwork of cells (Antoni B) [11].

The major differential diagnosis includes neurofibroma which is also a nerve sheath tumour. It may be localized, diffuse, or plexiform type. The localized type is the most common that represents approximately 90% of lesions. The histologic appearance of solitary localized neurofibroma is markedly different from that of schwannoma. Neurofibromas do not contain Antoni A or Antoni B regions. Moreover, degenerative regions are not as prominent as in Schwannomas [7, 8].

CONCLUSION

Thus although uncommon, schwannomas may occur at costo-chondral junction and must always be considered a differential diagnosis of a chest wall mass in adults. Also CT should be advised in such cases for assessment of tumour morphology, composition, location, and extent and also to rule out sinister causes like malignancy.

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