# Management of Recurrent Benign Chest Wall Tumour: Case series

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## Abstract

*The chest wall is the musculoskeletal structure that ensures chest wall integrity and stability of the shoulder and provides protection to the vital organs contained within. Chest-wall tumors are classified into primary and secondary tumors. Primary chest wall tumors originate from anatomical structures that include the bones and cartilages of the thoracic cage and the supportive and conductive soft tissue. Primary tumors of the chest wall are rare although most of them are malignant. Secondary tumors of the chest wall are also known as metastatic lesion of the chest wall have higher incidence than primary tumors, the most common are breast and lung cancer metastases. These tumors are usually malignant, the chest wall and sternal resection could have a palliative role, with the aim of controlling the pain, ulceration, as well as possible bleeding and infections caused by the tumor mass. The availability of highly skilled surgeons and availability of prosthetic materials for reconstruction has made the involvement of ribs, sternum, and spine not an absolute contraindication to the surgery. We discussed two patients who had recurrent chest wall tumour with histology diagnosis of neurofibroma. They both had chest wall mass excisional biopsy with reconstruction. Both patients are being followed up and are tumour free.*

***Keyword:*** *Benign chest wall tumour*

## Introduction

The chest wall is the musculoskeletal structure that ensures integrity and stability of the shoulder and provides protection to the vital organs contained within. The thoracic wall is also involved in normal respiratory function. The chest wall can be a home to both benign and malignant tumors.[1]

Chest-wall tumors are classified into primary and secondary tumors. Primary chest wall tumors originate from anatomical structures that include the bones and cartilages of the thoracic cage, vertebrae, clavicle, muscles, fat, facial blood vessels, nerves. [2] Primary tumors of the chest wall are rare and account for less than 2% of all cancers occurring in the chest, and about 50% to 80% of these are malignant. [2,3] Secondary tumors of the chest wall are also known as metastatic lesion of the chest wall. Secondary chest wall tumors have a higher incidence than primary tumors, and the most common are breast and lung cancer metastases. These tumors are usually malignant, the chest wall and sternal resection could have a palliative role, with the aim of controlling the pain the ulceration, as well as possible bleeding and infections caused by the tumor mass. Surgical resection and possible reconstruction of the chest wall. Surgeons must consider previous therapies and surgeries performed in the management of these patients. [3,4]

Benign chest wall tumour often appears as palpable and indolent chest wall mass. There are few which can easily be identified. These include lipoma, hemangioma and

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lymphangioma.[5] These tumours can be identified using investigation. While others such as chondromas, aneurysmal bone cyst will require initial incisional biopsy.[6]

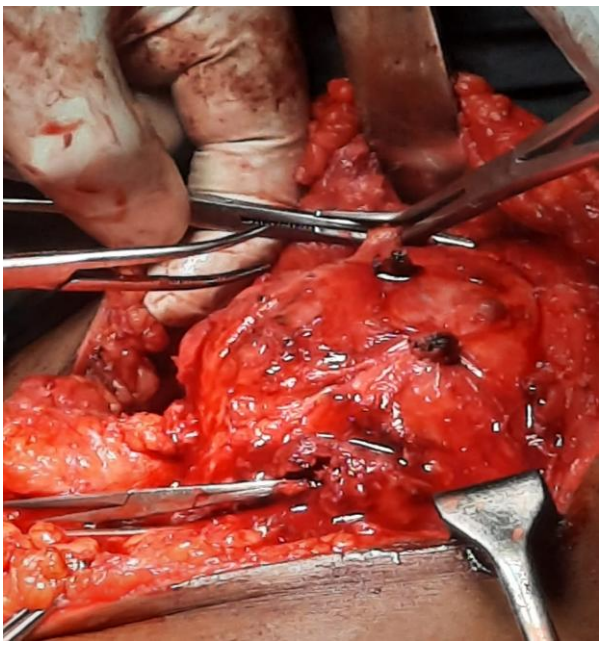
The management of chest-wall tumors in recent years has improved due to ability of surgeons to do En-bloc surgical resection with adequate tumour free margins to avoid local recurrence, and the ability to reconstruct the chest with the aim of obliterating anatomical defects and preventing skeletal instability, paradoxical respiratory motion, respiratory failure, and respiratory infection.[2] The presence of high skill surgeons and availability of prosthetic materials for reconstruction has made the involvement of ribs, sternum, and spine not to be considered an absolute contraindication to the surgical management. Cure can be achieved, and prognosis is better.[7]

## Case A

A 24-year-old woman was referred from the medical outpatient clinic to general surgery out-patient clinic with a painful chest wall swelling of a year. The size of the swelling was the size of her thumb and continued to grow to the size of a table tennis ball. Pain was marked at the scar of the previous biopsy. No history of swelling in any other part of the body. No history of trauma. She had an excision biopsy of the same swelling 6 months previously and was discharge. She represented 6 months after the first surgery to the general surgery clinic with a history of recurrence. She noticed it 6 months after the first surgery and had continued to increase in size with associated pain. Patients have initially been reassured after the surgery and histology could not be tracked. No history of weight loss, nausea anorexia. No cough chest pain or difficulty with breathing. Following the above findings she was referred to the cardiothoracic out-patient clinic. She is a known asthmatic, on seretide inhaler and has been attack free for 2 years. Last menstrual period was 2 weeks prior to presentation.

Physical examination revealed a young woman, who was not pale, anicteric, acyanotic with no obvious respiratory distress. She had no peripheral lymphadenopathy. The pulse rate was 67 beats per minute, regular with full volume. Blood pressure was 110/70 mmHg. The apex beat was located at the fifth left intercostal space and not heaving. The heart sounds were first and second only. The respiratory rate was 16 cycles per minute. The chest was resonant to percussion and auscultation revealed vesicular breath sounds bilaterally with no added sound. There was a tender, firm, immobile swelling over the left chest wall. It extended from anterior axillary line to posterior axillary line. Chest wall swelling is 12 by 8 cm in size. Healed surgical scar was noted over the apex of the swelling. The abdominal and nervous system examinations were essentially normal. Musculoskeletal review was also essentially normal.

Chest computed tomography (CT) scan showed an isodense oval-shaped mass lesion is noted as overlying the 6th left costal cartilage extending into the left pleural. The lung fields, heart and remaining outlined bones appear normal. The chest wall muscles were not involved. Abdominal ultrasound scan, complete blood count, liver and renal function tests showed no abnormality. A diagnosis of chest wall mass was made and she subsequently had a tru-cut biopsy with a histologic diagnosis of Osteosarcoma. She subsequently had en-bloc chest wall resection of the tumor with the $5^{th}$, $6^{th}$ and $7^{th}$ rib and costal cartilage with reconstruction using polypropylene mesh and latissimus dorsi muscle (Figure 1and 2 below). The histology of the mass was neurofibroma. The patient was discharged home after 3 weeks, following the removal of all drains. Patients are being followed up in clinic and no recurrence of mass from the site of excision.



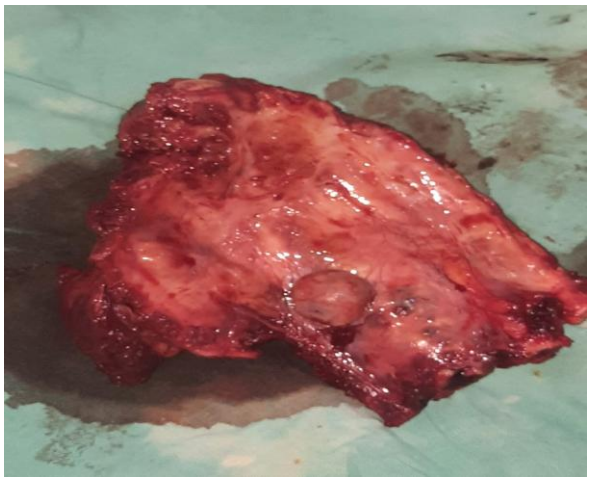
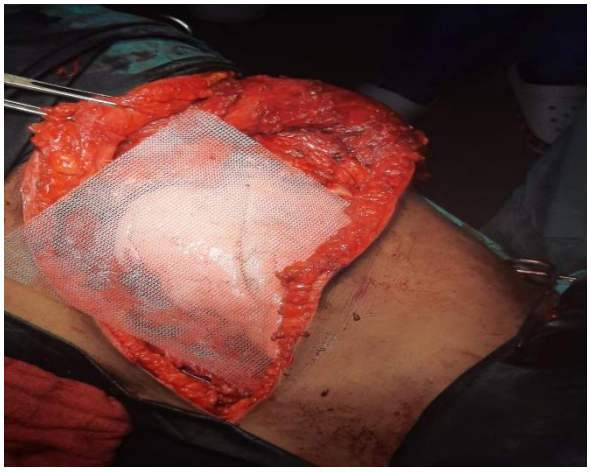


Figure 1. Images showed the mass during dissection and after en-bloc excision with the ribs (the arrow pointing at the pleural extension). In case A.



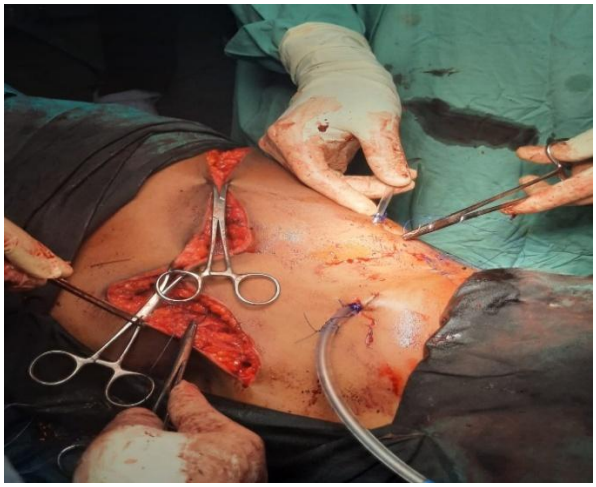


Figure 2 image below shows the post excision wound and the mesh while the other shows the wound been opposed and arrows on the chest tube and drains. In case A

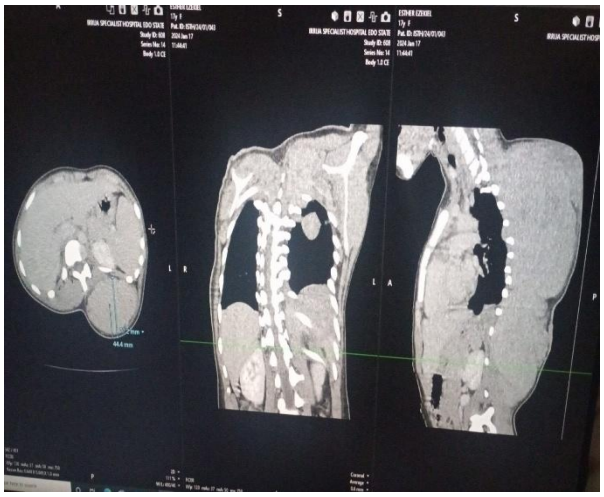
## Case B

A 17year-old secondary school student who was referred from the pediatric outpatient clinic to surgery out-patient clinic with a history of recurrent painful chest wall swelling involving the whole of the left side of the back of 8-year duration. She initially had an excision biopsy 7 years ago. Two months following the initial excision she noticed swelling to have reappeared and grew over time to occupy the whole back of the left side of the chest. No history of weight loss anorexia, nausea or vomiting. No history of cough nor difficulty with breathing. No history of swelling in any other part of the body. No history of trauma. She presented an account of pain and swelling. She is not a known epileptic or asthmatic patient.

Physical examination revealed a school age girl, who was not pale, anicteric, acyanotic with no obvious respiratory distress. She had no peripheral lymphadenopathy. The respiratory rate was 20 cycles per minute. The chest was resonant to percussion and auscultation revealed vesicular breath sounds bilaterally with no added sound. The pulse rate was 88 beats per minute, regular with full volume. Blood pressure was 110/76 mmHg. The apex beat was located at the fifth left intercostal space and not heaving. The heart sounds were first and second only. There was an immobile swelling over the left back extending from the midaxillary line to left border of the vertebrae. Extending from the neck to the level of the $12^{th}$ rib inferiorly. Healed surgical scar was noted over the mid portion of the mass. Scar was tender. There was scoliosis of the thoracic vertebral, but no step deformity. The abdominal and nervous system examinations were essentially normal. Musculoskeletal systems were essentially normal.

The chest computed tomography (CT) scan (Figure 3a and 3b below) confirmed the isodense mass on the posterior chest measuring 365mm on the longitudinal diameter and 340mm transversely. There was an intrathoracic extension in the $3^{rd}$ and $8^{th}$ intercostal space. The mass had a well-defined border. The lung fields, the heart and the mediastinal structures are normal and intact. There was scoliosis of the thoracic vertebral, the remaining bony thorax and overlying soft tissues were normal. She had a tru-cut biopsy done and the histology was neurofibroma. Assessment of neurofibromatosis. She had a wide local excision biopsy and reconstruction of the posterior chest wall. Weight of

the mass was 3.5kg. she was discharged 3 weeks after removal of all drains.



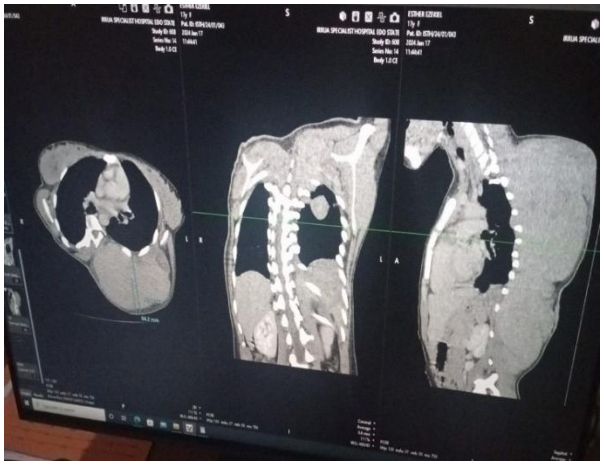
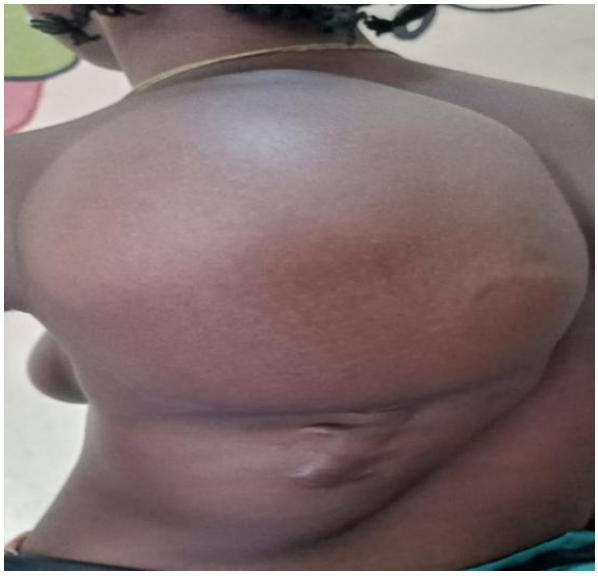


Figure 3 above images showed the chest computed tomography before surgery. In case B



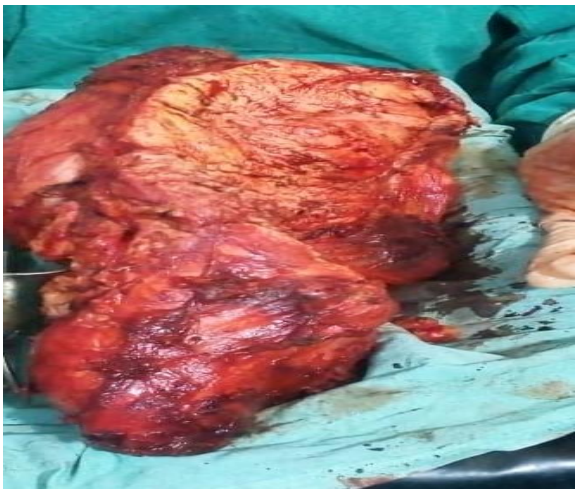


Figure 4 above images showed the mass before and after dissection en-bloc excision. In case B

## Discussion

Chest wall tumor is a generic term that includes primary neoplasm (both benign and malignant) of the bony skeleton; chest wall metastases.[5,8] Neoplasms that invade the chest wall are from lung, pleura, mediastinum, nerve, muscle, and breast; which can be benign or malignant conditions.[8] Though most chest wall tumor are malignant hence it was not unusual for pathologist to make a diagnosis of a sarcoma in the first case report.[1] This was supported with the fact that it is a recurrent mass with intrapleural extension. The duration of the mass is less likely in the second case. Seven years is long for malignant disease. The second case in the cases is known to have scoliosis as 1/3rd of patients with neurofibromatosis do have scoliosis as complication.[9] The first case had en-bloc resection of 3 ribs in addition to the mass as the initial incisional biopsy gave a diagnosis of malignancy. This was a bigger surgery compared to that of the second case even though the mass was bigger. As the resection of ribs has more effect on the respiratory system and efficiency of the respiratory system. Which had a strong influence on the post-operative recovery.

Both patients had recurrence after the initial resection before presenting for the above surgery as in the first case the soft tissue scan described it as a subcutaneous mass but at surgery the surgeons could not excise the whole mass as they planned for excision but eventually did incision biopsy. We could not get information about the second case as we do not have access to the surgeon. Recurrent neurofibroma is a problem for patients and

surgeons. Hence the need for complete tumor resection.[10] Hence the finding of a recurrent mass does not necessarily indicate it is a malignancy.

The need for biopsy and imaging modality is important to help with planning of patient with chest wall mass. The need to involve other sub-specialties in surgery such as plastic and reconstructive surgery unit, general surgery unit, pediatric surgery unit, cardiothoracic and vascular of surgery unit, pediatrician, oncologist, nutritionist and physiotherapy. These specialists have great influence in improving the outcome of patients.

## Conclusion

Benign chest wall tumors are rare. Simple excision biopsy will be adequate for treatment. The risk of recurrent is high in neurofibroma due to incomplete excision. The need for biopsy and imaging modalities is very important to the surgeon in planning the extent of surgery. The outcome is good irrespective of the extent of surgery as shown from the above 2 cases. Provided the patient gets adequate reconstruction when needs arise.

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