



MANAGEMENT CHALLENGE IN CHEST WALL NEOPLASMS; A 2 YEAR EXPERIENCE

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ABSTRACT... Introduction: Chest wall neoplasms are rare and represent only about 5% of all thoracic neoplasm. We present our 2 years analysis of the clinical features, presentation, diagnosis and treatment of chest wall neoplasms. **Study design:** Case series study. **Place and duration of study:** Ojha Institute of Chest Diseases, Dow University of Health Sciences, Karachi, Pakistan from Nov 2012- Oct 2014. **Methodology:** Between 2012 and 2014, 39 patients with solid chest wall masses were enrolled in the study. Tumors were categorized as benign and malignant, including primary and secondary, after histopathological diagnosis with tissue biopsy. Data on patients' characteristics, symptoms, tumor type and management was recorded and analysed. **Results:** The study included 39 patients (20 males and 19 females) with age range 18-71 years (mean 36.3). 21 (53.8%) patients had benign chest wall tumors while 18 (46.1%) patients had malignant tumors. Among malignant tumors, 14 (77%) patients had primary malignancy where as 4 (22%) patients had chest wall tumor secondary to primary tumor elsewhere. Among these 4, the primary tumor remained unknown in 1 patient. The most common benign solid lesion was chest wall lesion lipoma in 8/21 patients (38%). Among malignant tumors, chondrosarcoma (4/14, 29%) was the most common. **Conclusion:** Preoperative needs careful assessment of the patient, radiological imaging and histopathological examination for diagnosis of the tumor in the chest wall. Using a multidisciplinary team approach, excellent results can be available with complete surgical resection, reconstruction of the chest wall and appropriate or neo adjuvant treatment where necessary.

Key words: chest wall tumor, surgical tumor resection, chest wall reconstruction, tissue biopsy.

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INTRODUCTION

The tumors of the chest wall raised structures that support the thorax, including bone, cartilage, muscle, fat, fibrous connective tissue, nerves, blood vessels or lymphatics.¹ The most frequent benign chest wall tumors are osteochondromas (50%), followed by chondromas (10-20%) and fibrous dysplasias (10%).² Sarcomas are the most common overall malignant chest wall tumors and include chondrosarcomas (30%), osteosarcomas (15%) and Ewing sarcomas (10%).³ Fibrosarcomas and malignant fibrous histiocytomas constitute the most common soft tissue malignancy of the chest wall.³ Chest wall tumors present in the 5th or 6th decade of life with equal gender distribution and equal possibility of being benign or malignant.⁴

Radiographic imaging with Chest X ray and CT scan chest are useful in the detection and localization of the tumor and to define its extent. Definitive diagnosis is obtained through tissue biopsy. The mode of tissue diagnosis is determined by the size of the lesion with excisional biopsy used for tumors <5cm and tru cut biopsy for tumors >5cm. Surgical resection remains the treatment of choice with the use of adjuvant therapy as required.⁵

MATERIAL & METHODS

Between 2012 and 2014, 74 patients of either sex, presented to us with chest wall swelling. After informed consent, history taking and physical examination was performed in each patient.

Aspiration was attempted if the chest wall swelling appeared cystic on physical exam and confirmed by ultrasound where required. If the aspirate contained pus or blood (in case of history of trauma), the patient was excluded from the study. 35 patients were excluded. The remaining 39 patients with solid chest wall masses underwent radiographic studies to determine the site and extent of the lesion. Confirmatory diagnosis was obtained after tissue biopsy using any of 3 diagnostic modalities. Excisional biopsy was done for tumors <5cm and needle tru-cut biopsy or incisional biopsy was performed for tumors >5cm. Tumors were then categorized according to histopathological diagnosis as benign, primary malignant or secondary malignant. In case of secondary malignant tumor, further work-up was advised to identify primary site of tumor and other secondaries in the body. Data on patients' demographical characteristics, clinical features, type of tumor and treatment was recorded and analysed. Final analysis included 39 patients. Data is presented as simple percentages and frequency tables. No statistical significance tests were run due to the descriptive nature of the study.

RESULTS

There were 39 patients including 20 males and 19 females with age ranging from 18-71years (mean age 36) [Table-I]. Chest pain was present in 47.6% of benign lesions and 33.3% of malignant tumors. Excisional biopsy was performed in 16(41%) patients, tru cut biopsy in 13(33.3%) and incisional biopsy in 10(26%) patients. There were 21(53.8%) benign chest wall tumors and 18(46.2%) malignant lesions. Among the malignant tumors, 14 (78%) patients had primary malignancy where as 4(22%) patients had chest wall metastasis secondary to primary malignancy elsewhere. 2 patients had metastasis secondary to lung adenocarcinoma and 1 patient had metastasis secondary to primary renal cell carcinoma. In 1 patient, the primary tumor remained unknown. The most common benign chest wall tumor was lipoma in 8/21(38%) patients. Most common primary malignant tumor was sarcoma. Local surgical resection with clear margins was

performed in all cases of benign chest wall lesions. For primary malignant chest wall tumors, surgical resection with wide excision margins of 4cm was performed in all patients. 3 patients with primary malignant tumors had positive tumor margins and underwent adjuvant radio and chemotherapy post-operatively. 1 patient with Ewing sarcoma underwent neoadjuvant chemotherapy to shrink the tumor before attempting surgical resection. Primary repair was performed in 16 patients (41%). Reconstruction of the chest wall was required in 23(59%) cases. In 9(23%) cases, it was done by muscle flaps only and 14(35%) cases required prosthetic polypropylene mesh and muscle flap. Figure-I.

Characteristics	Benign	Malignant
Male	9	11
Female	12	7
Mean age	32 years	47 years

Table-I. Gender and age distribution of patients.

Histopathology	No. of Patients	Percentage of Total
Lipoma	8	38%
Osteochondroma	5	24%
Chondroma	2	9.5%
Benign fibrous histiocytoma	3	14.2%
Neurofibroma	2	9.5%
Schwannoma	1	4.7%
Total	21	53.8%

Table-II. Benign Chest Wall Tumors

DISCUSSION

Chest wall tumors account for 5% of all thoracic neoplasms and may be benign or malignant. The malignant tumors may be primary malignant or metastasis of chest wall from primary tumor elsewhere. Commonly reported symptoms include chest pain and palpable mass for both benign and malignant chest wall tumors.⁶ Other symptoms included cough, shortness of breath and weight loss. On physical exam, soft tissue tumors were mostly firm on palpation while bony tumors were hard and fixed.

Histopathology	No. of Patients	Percentage of Total
Primary Malignant Neoplasm		
Chondrosarcoma	4	22%
Osteosarcoma	2	11%
Malignant fibrous histiocytoma	2	11%
Primitive neuroectodermal, Askin tumor	1	5.5%
Rhabdomyosarcoma	1	5.5%
Malignant peripheral nerve sheath tumor	1	5.5%
Ewing's sarcoma	2	11%
Dermatofibrosarcoma protuberans	1	5.5%
Total	14	36%
Secondary Metastatic Neoplasm		
Adenocarcinoma with primary lung cancer	2	11%
Squamous cell carcinoma(primary unknown)	1	5.5%
Metastatic renal cell carcinoma	1	5.5%
Total	4	10%

Table-III. Malignant Chest Wall Tumors

Repair of Chest Wall Defect

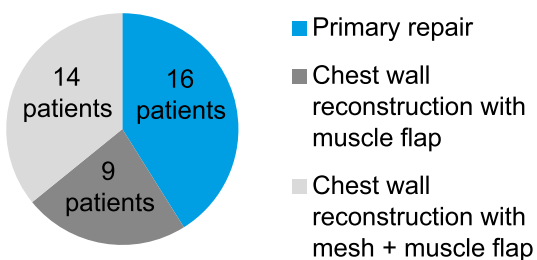


Figure-I.

Chest X-ray and CT scan are useful for determining the extent of tumor invasion and surgical treatment planning. Definitive diagnosis is obtained by tissue biopsy with either, incisional biopsy, true cut or excisional biopsy depending on the size of the tumor.⁷ Sufficient resection remains the

treatment of choice for tumors of the chest wall. Treatment for benign tumors is local excision with clear margins.⁸ For malignant tumors, oncologic resection with at least 3-4cm margins should be attempted.⁸ Adjuvant chemoradiotherapy is reserved for those with positive margins.⁹

In our study, lipomas were the most common benign chest wall tumor. They are soft to firm in consistency and composed of mature adipose tissue. Treatment includes local excision.² The 2nd most common benign tumor was Osteochondromas. They constitute 50% of the chest wall neoplasms benign and usually found in rib or scapula.¹⁰ Often cause pain as they move forward with the growth of bone exostosis. Surgical resection provides full symptomatic relief and reduce the risk of malignant transformation.

Sarcomas are the most common primary chest wall malignancy. Chondrosarcomas account for the majority of them and are found on the anterior chest wall.⁸ These represent malignant tumors degeneration benign chondroma, and there is as painful hard, slow growing mass. Chondrosarcomas are excised surgically and irradiated if negative margins cannot be achieved. Local recurrence rate is 4% with negative margins and 73% with positive margins.¹¹ Hence local control of disease is an important prognostic factor for recurrence.

Osteosarcomas usually appears on the side, scapula and clavicles and exists as painful masses or young adults.¹ Metastatic at the time of disease presentation is common, the most common sites were the lungs, lymph nodes and liver. Wide local excision therapy in combination with chemotherapy. Response to chemotherapy, tumor burden, and the presence of metastases are predictive of overall survival.¹ Ewing's sarcoma is the most common third primary malignant tumor of thoracic wall.⁵ Induction chemotherapy usually done to reduce tumor burden, followed by local excision width. Response to chemotherapy is predictive of local recurrence.⁸ Other sarcomas in our study included rhabdomyosarcoma and dermatofibrosarcoma.

Chest wall tumors remain a motivating analytic and therapeutic challenge for thoracic surgeons. Optimal outcomes for malignant tumors can be achieved with complete resection and appropriate chest wall reconstruction with muscle flaps or prosthesis.^{12,13} In our study, immediate closure of defect was performed in all patients. In the case of small defects with resection of 2 ribs or defect <5cm, successful reconstruction was achieved by muscle flap. In cases of large chest wall defects with resection of > 2 ribs or defect was >5cm, prosthetic polypropylene mesh placement was required. Survival after surgical resection depends upon the histology of tumor, free resection margins and distant metastasis. The definitive findings is limited by the low number for any given volume. Sarcomas have a chest wall sarcomas most thoroughly researched, and primary reported 17% survival 5 years.⁵

CONCLUSIONS

Finally, it needs careful preoperative evaluation of the patient, radiographic imaging and histopathology for diagnosis of tumors of the chest wall, which provides diagnostic and therapeutic interesting challenge for thoracic surgeons. An interdisciplinary approach is necessary for the best possible result related to mortality of cancer and long-term survival of these patients. Excellent results can be available with complete surgical resection, reconstruction of the chest wall and appropriate introductory or adjuvant treatment where necessary.

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“Surround yourself with positive people who will support you when it rains, not just when it shines.”

Unknown



AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author-s Full Name	Contribution to the paper	Author=s Signature
1	Dr. Niaz Hussain Soomro	Conception and design	
2	Dr. Aneeqa Ahsan Zafar	Statistical expertise, Critical revision of the article for improtant intellectual content	
3	Dr. Saifullah Baig	Drafting of the article	
4	Dr. Guzel Maxood	Critical revision of the article for important intellectual content	
5	Dr. Nasir Rao	Data collection	