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A Case of Neurilemmoma Originated from Intercostal Nerve

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Introduction

Chest wall tumors are uncommon diseases, and most of them are metastatic tumors. Primary chest wall tumors are rare. In this report we present a case of neurilemmoma, a rare primary chest wall tumor, which originated from intercostal nerve. Excising the tumor with an adjacent rib resulted in a chest wall defect, and the defect was repaired with subscapular muscle. The patient had a relatively uncomplicated postoperative course and soon regained unrestricted movement of his upper extremity.

Case report

A 34-year-old man was admitted to Kouga Hospital on September 12, 1984 because of a tumor pointed out by a mass roentgenography of the chest. The tumor appeared asymptomatically on plain chest roentgenogram (Fig. 1). The patient showed no abnormalities in laboratory findings (Table 1) and physical examinations. Computed tomography (CT) revealed a tumor on the right posterior chest wall (Fig. 2), and ultrasonography showed the

Table 1. Laboratory findings

RBC	5.2×10^6	
Ht	49%	
Hb	16.9 g/dl	
WBC	8000	
CRP	negative	
CEA	3.6 μg/ml	(< 5)
AFP	3.0 μg/ml	(<20)
TP	8.3 g/dl	(6.5－8.2)
T-chol	198 mg/dl	(130－220)
FBS	97 mg/dl	
GOT	24	(8－ 40)
GPT	13	(5－ 30)
LDH	370	(50－400)
BUN	11 mg/dl	(8－ 20)

* Numbers in parentheses represent normal range.

Key words: Chest wall tumor, Neurilemmoma, Intercostal nerve, Chest wall defect, Subscapular muscle.
索引語：胸壁腫瘍，神経鞘腫，肋間神経，胸壁欠損，肩甲下筋.
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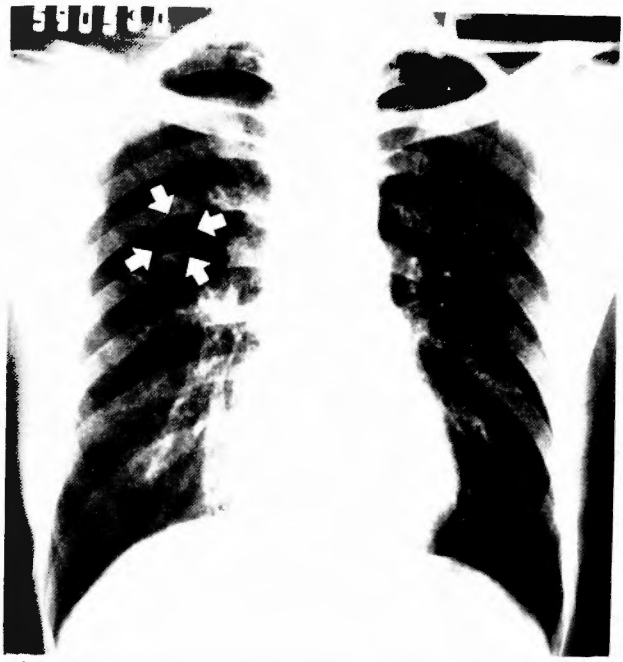

Fig. 1. A plain chest roentgenogram showed a round tumor and an eroded rib (arrows).

lung moving independently of the tumor. Based on these findings we diagnosed this tumor as a chest wall tumor. Furthermore the tumor eroded the inferior margin of the 6th rib smoothly (Figs. 1 and 3). This led us to diagnose this tumor as a neurogenic tumor originated from the

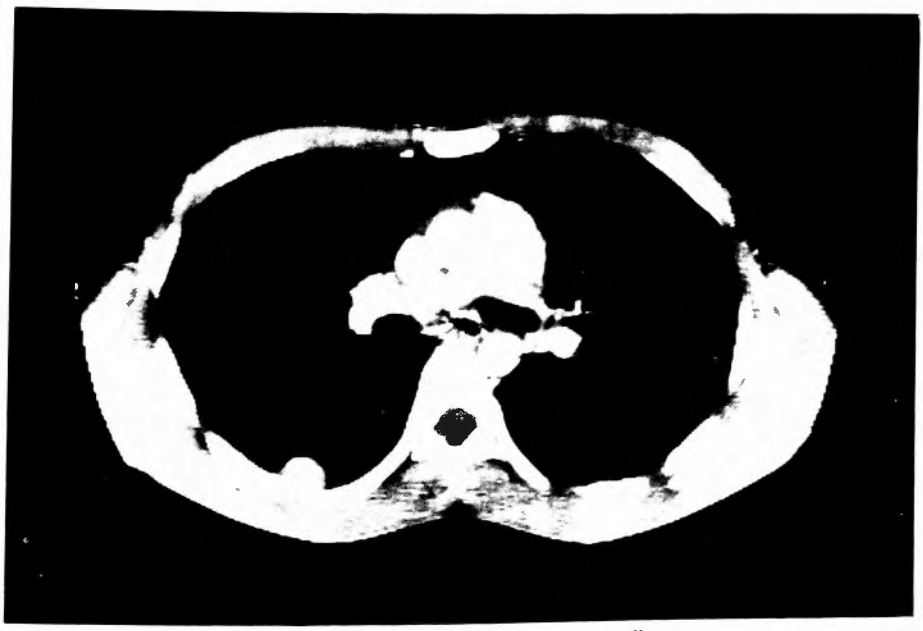

Fig. 2. CT showed the tumor as a chest wall tumor.

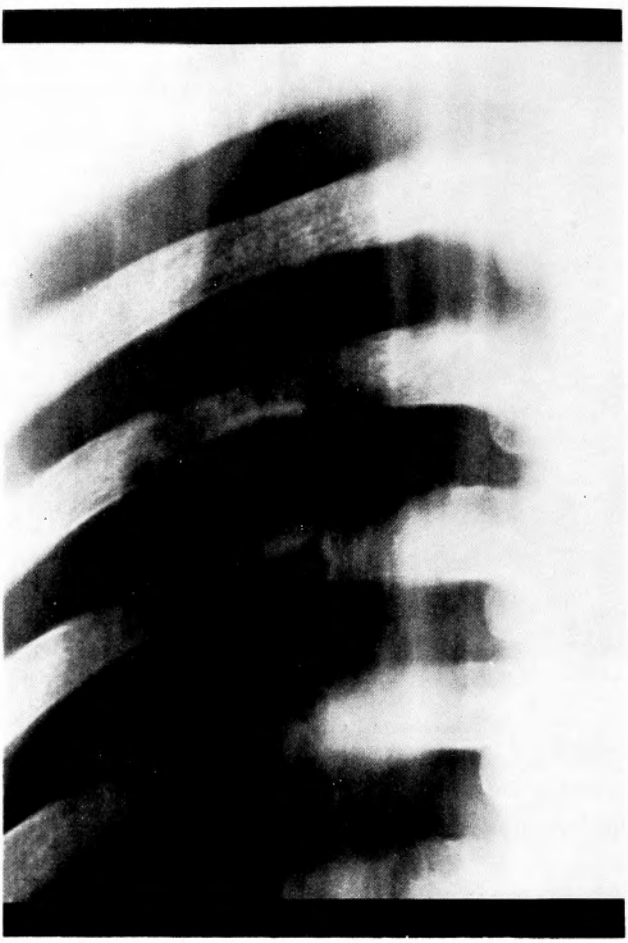

Fig. 3. A tomogram showed an eroded rib.

intercostal nerve.

On September 27, 1984 thoracotomy was performed by right posterolateral incision. The tumor was located outside the parietal pleura between 6th and 7th ribs, and was excised with the adjacent 6th rib (about 12 cm in length), intercostal muscle, and pleura. Defect of the chest wall (5×12 cm) resulted from these extirpative procedures. The defect was just beneath the scapula, so we covered the defect by the subscapular muscle suturing it to the intercostal muscles. The patient's postoperative course was uncomplicated, and after three months he had no restriction of movement of the upper extremity.

The excised tumor was well encapsulated, firm, yellowish in color, round, smooth, and 2 cm in diameter. Microscopically, the tumor showed for the most part Antoni type A pattern, i.e., it was quite cellular and composed of spindle cells often arranged in a palisading fashion. Mitoses were absent. Pathology sections showed benign neurilemmoma (Fig. 4).

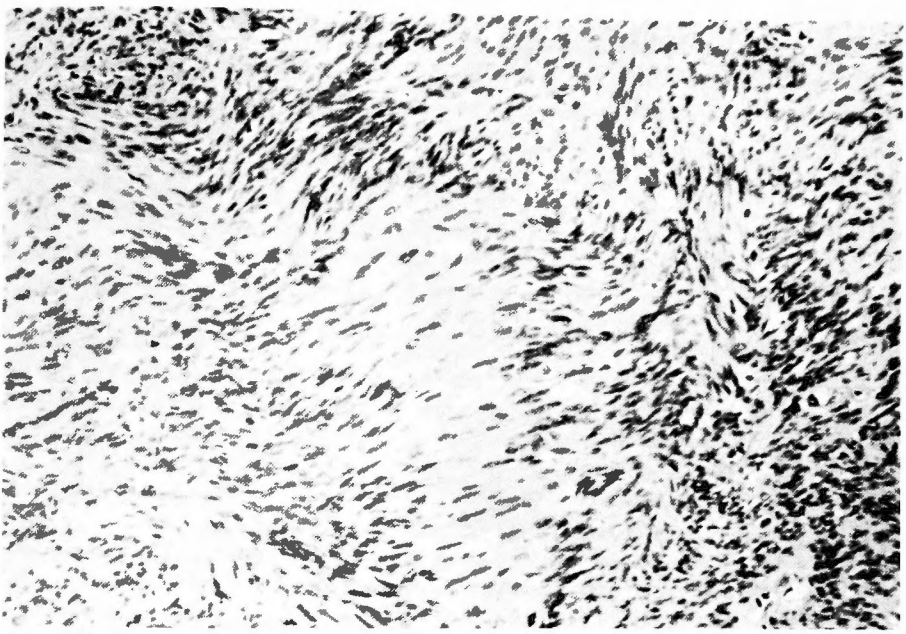

Fig. 4. Microscopically, the tumor showed for the most part Antoni type A pattern.

Comments

We preoperatively diagnosed this tumor as a neurogenic tumor originated from the intercostal nerve. CT and ultrasonography helped to assess the location of the tumor; especially the latter proved very useful in observing the tumor's relation to the lung. Additionally, the plain chest roentgenogram, which showed the tumor eroding the inferior margin of the rib, suggested the origin of the tumor[16].

Chest wall tumors are infrequent, and most of them are metastatic tumors. Primary chest wall tumors, which may arise from any structure of the wall, are very rare[8,11,12,14,15]. Several authors have reported about primary chest wall tumors, dividing them into different histological groups[8,19]. We arranged and showed some of these reports[1,5,21] in tables 2 and 3. In malignant primary chest wall tumors, as shown in table 2, osteogenic tumors that originated from ribs are the most common (18 cases); the other soft tissue tumors number 27 cases. Among benign tumors, as shown in table 3, tumors originated from ribs are also the most common (27 cases). The next common tumors are neurogenic tumors (10 cases).

There are two distinct histologic types of benign neurogenic tumors[4,9,17]. The commonest type is the neurofibroma which usually occurs as a solitary tumor but is occasionally multiple and found associated with von Recklinghausen's disease. This type of tumor may undergo malignant transformation. The other type is the neurilemmoma which is usually well encapsulated, almost always benign, and does not recur after complete surgical removal.

In the present case, we considered that wide exision of the tumor with the adjacent rib should be the treatment of choice because of the following reasons: (1) we could not discern the histo-

Table 2. Malignant chest wall tumors

	Authors		
	Threlkel	Fukushima	Blades
Chondrosarcoma	3		
Osteogenic sarcoma	2	2	
Ewing's sarcoma	2		3
Myeloma	3		
Reticulum sarcoma		1	1
Hodgkin's disease			1
Fibrosarcoma	7	1	5
Hemangiosarcoma	2		2
Neurosarcoma	2		
Neurofibrosarcoma			4
Rhabdomyosarcoma		1	
Liposarcoma	1		
Malignant melanoma			2
Squamous cell carcinoma	1		
Unclassified sarcoma			2

logical type preoperatively, (2) it has been estimated that 10 to 20 percent of neurofibromas show malignant changes[20], (3) neurilemmomas, even if they are small, are not always benign[2,3,7,13].

In the posterior chest wall, removal of even one rib results in a chest wall defect. There are a variety of reconstructive techniques available to deal with the defect[18]. If the defect is wide,

Table 3. Benign chest wall tumors

	Authors		
	Threlkel	Fukushima	Blades
Fibrous dysplasia	5		6
Osteochondroma	4		3
Osteoblastoma	1		
Giant cell tumor	1		
Chondroma		1	4
Chondroblastoma		1	
Eosinophilic granuloma	1		
Hemangioma	5		
Lymphangioma		1	
Fibroma	2		2
Fibroxanthoma	1		
Desmoid		1	
Perineural fibroma			1
Ganglioneuroma			2
Neurofibroma	2		4
Neurilemmoma		1	
Lipoma			6

normal respiratory physiology and adequate ventilation will be hindered, so reinforcement of the thoracic cage is often attempted by the use of prosthetics such as Marlex mesh[10]. In the case of a small defect, the prosthetic approach is not advisable because of likelihood of infection. However, even a small defect can cause the troublesome complication of subcutaneous emphysema.

For closure of our patient's defect, we used subscapular muscle without detaching the muscle from the scapula. We paid attention to the movability of the shoulder, and the patient showed no restriction after a postoperative lapse of three months.

On the basis of our experience, we think that the use of subscapular muscle to repair a small defect of the posterior and superior chest wall is technically easy and successfully eliminates restriction of movement of the shoulder joint.

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和文抄録

肋間神経より発生した神経鞘腫の一例

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胸壁腫瘍は比較的稀な疾患で，その多くは転移性腫瘍であり，原発性腫瘍は少い．この度，肋間神経由来の神経鞘腫を経験した．

症例は34才の男性で，健診の胸部レ線撮影で異常陰影を指摘され来院した．胸部レ線写真，超音波検査，CT 検査の結果，肋間神経由来の腫瘍と診断し，隣接する肋骨を含めて腫瘍を摘出した．腫瘍は後胸壁第Ⅵ肋間に存在し直径 20 mm の卵形であった．病理学的には良性の神経鞘腫と診断された．胸壁欠損に対して肩甲下筋を使用したが，術後3ヶ月経た後は，患側上肢の運動制限も消失し順調に経過した．