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Case report

A CASE OF BENIGN SCHWANNOMA OF THE THORACIC WALL MIMICKING A MALIGNANT TUMOR

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INDEXING WORDS

schwannoma; angiography; histopathological study

SYNOPSIS

A fist-sized tumor mainly locating in the right thoracic wall of a 73 year-old woman was found by ultrasonography and computed tomography, although a definitive diagnosis was not obtained because of the tumor extension to the abdominal cavity from the right internal thoracic wall, precluding biopsy. Angiography of

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the right eleventh intercostal artery demonstrated irregular tumor vessels, indicating malignant nature of the tumor. Therefore en-block resection of the tumor with the right eleventh rib was performed under a thoracotomy. Postoperative histopathological examination showed that the tumor was a benign schwannoma of Antoni type A.

Since schwannoma is usually difficult to diagnose pre-operatively without histopathological study, it is suggested that patients with schwannoma-like tumors, as represented by the present case, should be treated carefully to avoid excessive surgery including an extensive resection of the surrounding tissue.

INTRODUCTION

Schwannoma, a not so uncommon tumor of the peripheral nervous system, arises from Schwann cells of the nerve sheath and sometimes assumes malignancy, especially in patients with von Recklinghausen's disease.[9)11)] However, the diagnosis of this tumor is generally difficult unless it arises from a peripheral nerve or is associated with von Recklinghausen's disease. The presence of certain histological features such as distinctive nuclear shapes, palisading of nuclei, tactoid differentiation, perivascular changes and the presence of heterologous elements is essential for the diagnosis of schwannoma.[4)7)] It is therefore impossible to rule out malignancy without histopathological confirmation. The prognosis of malignant schwannomas is poor[6)13)] and the selection of operative method depends upon whether the tumor is benign or malignant. However, asymptomatic benign schwannoma as represented by the present case, was difficult to obtain preoperatively a definitive diagnosis because of its location and extension to the intraabdominal cavity. Herein, we report a case of benign schwannoma mimicking a malignant tumor with a special reference to its therapeutic and diagnostic problems.

Table 1. Laboratory Findings on Admission.

WBC	58×10^2 /mm^3	ALP	196 IU/l
RBC	431×10^4 /mm^3	γ-GTP	45 IU/l
Hb	13.5 g/dl	Amylase	211 IU/l
Ht	40.7 %	BUN	16 mg/dl
Plt	21.2×10^4 /mm^3	Cr	0.6 mg/dl
TP	7.2 g/dl	CPK	46 IU/l
Alb	4.2 g/dl	T-chol	200 mg/dl
T-Bil	0.5 mg/dl	Glucose	100 mg/dl
AST	43 IU/l	Na	141 mEq/l
ALT	38 IU/l	K	4.5 mEq/l
LDH	362 IU/l	Cl	104 mEq/l

CASE REPORT

A 73 year-old woman had been consulting her primary care physician because of hypertention, hyperlipidemia and hypothyroidism for about ten years. In November, 1991 liver dysfunction was diagnosed based on liver function tests. Then an abdominal US located a mass lesion in the right thoracic wall developing into the intraabdominal cavity. She was admitted to our hospital on December 10, 1991 for more detailed examinations.

She had no additional complaints. There were no abnormal findings from physical examination and blood tests (Table 1). The tumor was not palpable on the surface of the body and neither hyperpigmentation nor subcutaneous nodules compatible with schwannoma or neurofibroma were seen.

On abdominal US, a tumor 6.3×4.9cm in size was seen between the liver and right kidney, developing from the right thoracic wall. The tumor was hypoechoic and uniform, and had a smooth surface with strong back echo. However its origin could not be traced (Fig.1). On the abdominal computed tomography (CT), the lesion was 6.0×5.0cm in size, arising in the right thoracic wall, with smooth surface and uniform low density. It was in contact

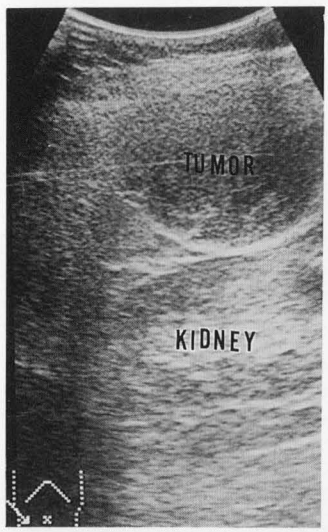

Fig. 1: Abdominal ultrasonography. The tumor 6.3×4.9cm in size is seen between liver and right kidney developing from the thoracic wall. The echogram shows the tumor with smooth surface, uniform low echo and strong back echo.

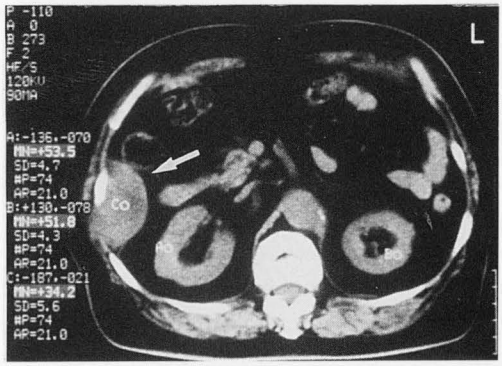

Fig. 2: Abdominal computed tomography. Lesion 6.0×5.0cm in size with uniform low density and smooth surface is seems to involve the rib and develop into the intraabdominal cavity.

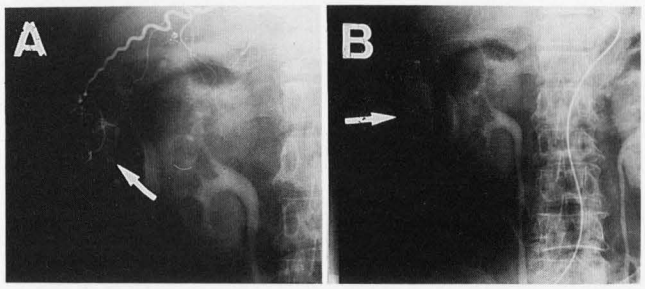

Fig. 3: Angiography of the right eleventh intercostal artery.
A: Hypervascularity in arterial phase.
B: Tumor stain in venous phase.

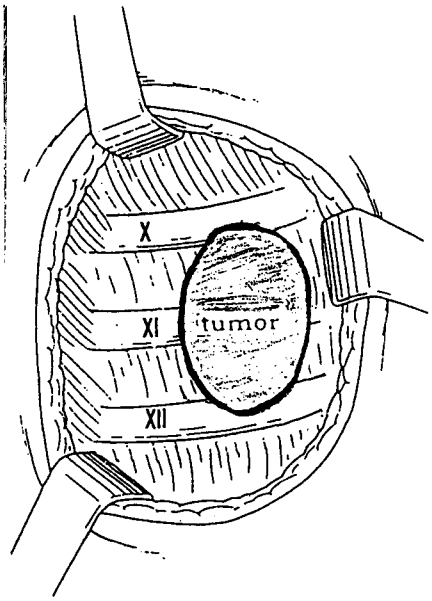

Fig. 4: Operative findings. The tumor occurs from the right thoracic wall involving the right eleventh rib, developing into the intraabdominal cavity, and does not adhere to any other organ.

with the right eleventh rib and developed into the intraabdominal cavity (Fig. 2). Angiography of the right eleventh intercostal artery showed hypervascularity in the arterial phase and tumor staining in the venous phase (Fig. 3).

The location of the tumor was found, but not its type and origin. Preoperatively, malignancy was suspected because, firstly, the tumor was relatively large, secondly, hypervascularity and tumor staining were seen in the angiography, and thirdly, the rib was involved as seen on CT. Surgery showed to be the tumor in the right thoracic wall involving the right eleventh rib and developing into the intraabdominal cavity. It did not adhere to any other organ (Fig.4). The tumor was resected en bloc with part of the eleventh rib through a thoracotomy.

Macroscopic observation of the resected specimen showed the tumor to be 7.3×4.4×3.1cm in size, encapsulated with a white smooth surface and rubbery in consistency (Fig. 5). Light microscopy revealed a cellular tumor of mostly spindle shaped cells with elongated slender cell processes arranged in sheets or

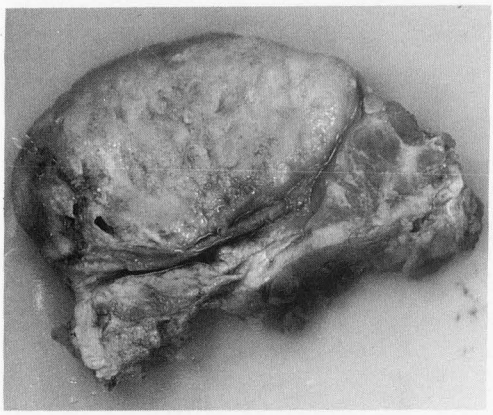

Fig. 5: Macroscopic findings. The tumor is 7.3×4.4×3.1cm in size, elastic firm and encapsulated with a white smooth surface.

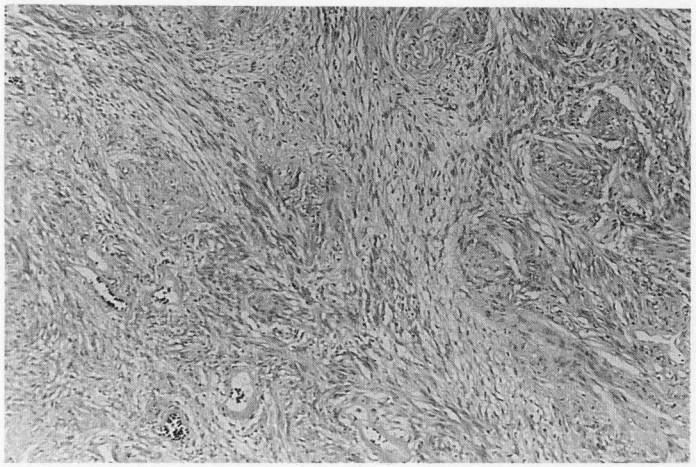

Fig. 6: Microscopic findings. Cellular tumor with mostly spindle shaped cells and elongated slender cell processes arranged in sheets or fasciles. Few mitoses are seen. ×75

fascicles. Few mitoses were seen (Fig. 6). The tumor was diagnosed as benign.

The patient progressed favorably after the operation and was dismissed on 1 March, 1992.

DISCUSSION

Schwannoma, a not so uncommon tumor, arises from peripheral nerves as the result of proliferation of the active and versatile Schwann cells that sheath nerve fibers. Schwannoma is typically a solitary encapsulated lesion that is often cystic when it is as large as 3 to 4 cm in diameter. It usually occurs in the major nerve trunks of the head or neck involving one of the larger peripheral nerves and rarely occurs in the thoracic wall. This tumor probably arose from the right eleventh intercostal nerve. Even when the tumor is large, there may be little or no neurologic deficit and the presence of a mass may be the first complaint.[8)14)] Unless the tumor exists on the surface of the body, its asymptomatic presence may never be found. This tumor had not been found until an abdominal US was performed for liver dysfunction because it developed into the intraabdominal cavity.

Schwannoma can be definitively diagnosed only by a histopathological study. Microscopically, the tumor consists of two types of tissue, Antoni A and Antoni B. Antoni A tissue is more typical of the tumor and consists of spindle cells, some of which show marked palisading. Antoni B tissue is myxomatous and degenerative. Cystic spaces and often thick-walled blood vessels[3)10)] are seen within it. Histopathologically, this case showed Antoni A type tissue of schwannoma. It has been reported that the incidence of malignant schwannoma is about 3 ～ 10% of all schwannomas and that it tends to enlarge and cause the patients to complain of pain, sensory disturbance, motor disturbance, and so on.[2)12)] Diagnosis of malignancy is made only by histopathological studies. Light microscopy of malignant schwannoma shows spindle cells with markedly irregular contours and buckled nuclei with mitoses[5)9)]. Recent studies[4)15)] have indicated that malignant schwannoma has S-100 protein which can be immunohistochemical staining, giving a definite diagnosis. These findings were not seen in this tumor and it was diagnosed as benign.

Since this tumor developed into the intraabdominal cavity, histopathological examination by biopsy was not possible, and the

preoperative diagnosis was not definitive. However, since the tumor was relatively large involving the rib in CT, and angiography of the right eleventh intercostal artery showed hypervascularity and tumor stain, malignancy was suspected preoperatively

The patient underwent thoracotomy because the nonsurgical prognosis of malignant schwannoma is very poor.[1)6)13)] This operation included the resection of the right eleventh rib because it was involved by the tumor according to CT studies. The severity of the surgery was weighed against the possibility that the tumor was malignant. If the tumor has been preoperatively diagnosed as benign, the tumor alone would have been resected or the operation would not have been done. To make the exact diagnosis, perioperative rapid pathologic diagnosis was considered. However, it would have been difficult to determine whether the tumor was benign or malignant even if such a method for diagnosis were possible.[9)]

It is suggested that despite large tumor size preoperative diagnosis of malignant or benign schwannoma is very difficult with out histopathological proof. In addition, as represented by this case, despite its benign nature the tumor appeared to invade other organs on preoperative CT and had positive angiographic findings suggestive of malignancy. Therefore, extensive resection including surrounding organs should be carefully determined without histopathological confirmation.

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