



Unusual case of thoracic outlet syndrome caused by a neurilemmoma in the pectoralis minor space

Hiroaki NAKAZAWA, Shinichi TERADA, Motohiro NOZAKI, Yuji KIKUCHI, Takashi HONDA, Tsukasa ISAGO

From Tokyo Women's Medical University

A 34-year-old man presented with a 5-year history of paraesthesia of the right palm and the right middle and ring fingers. This paraesthesia was exacerbated by elevation of the right arm. A tumour was palpable in the subclavicular fossa. As magnetic resonance imaging (MRI) indicated a neurogenic tumour originating from the brachial plexus, a diagnosis of thoracic outlet syndrome caused by a neurilemmoma in the pectoralis minor space was made. Pathological examination showed the tumour to be a benign neurilemmoma. There have been only three previous case reports of neurilemmomas as causes of thoracic outlet syndrome worldwide, and this is the first report of a neurilemmoma originating from the lateral fascicles of the brachial plexus in the pectoralis minor space causing thoracic outlet syndrome.

INTRODUCTION

Neurilemmomas are relatively uncommon, and in the peripheral nervous system these tumours are usually found associated with one of the main nerves of the limbs. Although pain and neurological symptoms are present in most cases of neurilemmoma, there have been three case reports of thoracic outlet syndrome caused by such tumours (1-3). This is the first report of a neurilemmoma originating from the lateral fascicles of the brachial plexus, causing thoracic outlet syndrome.

CASE REPORT

A 34-year-old man presented with a 5-year history of paraesthesia of the right palm and the right middle and ring fingers. This paraesthesia was exacerbated by elevation of the right arm. In 2002, although a mass lesion was palpable in the right subclavicular fossa, it had been ignored until then.

The tumour was round, smooth-surfaced, hard and elastic, non mobile, and 5 cm in diameter (fig 1). Tinel's sign was detected in the upper inner arm radiating along the median nerve distribution to the radial three digits. This paraesthesia was exacerbated by abduction of the upper right arm. With Wright's test, the radial pulse disappeared on hyper-abduction of the upper right

- Hiroaki Nakazawa, MD, Associate Professor.
- Shinichi Terada, MD, Clinical Instructor.
- Motohiro Nozaki, MD, Chairman.
- Yuji Kikuchi, MD, Assistant Professor.
- Takashi Honda, MD, Assistant Professor.
- Tsukasa Isago, MD, Assistant Professor.

Department of Plastic and Reconstructive Surgery, Tokyo Women's Medical University, Tokyo, Japan.

Correspondence : Hiroaki Nakazawa, Department of Plastic and Reconstructive Surgery, Tokyo Women's Medical University, 8-1, Kawada Cho, Shinjyuku Ku, Tokyo, Japan.

E-mail : nakazawa@prs.twmu.ac.jp.

© 2005, Acta Orthopædica Belgica.

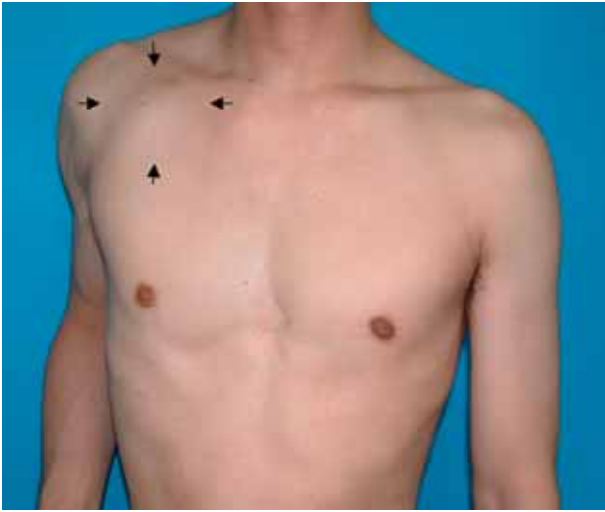


Fig. 1. — A 34-year-old man presented with a 5-year history of paraesthesia of the right palm, and the right middle and ring fingers. A tumour (5 cm in diameter) became visible in the subclavicular area when he abducted the acromioclavicular joint.



Fig. 3. — MRI in coronal view showed the tumour connected with the fascicles of the brachial plexus.

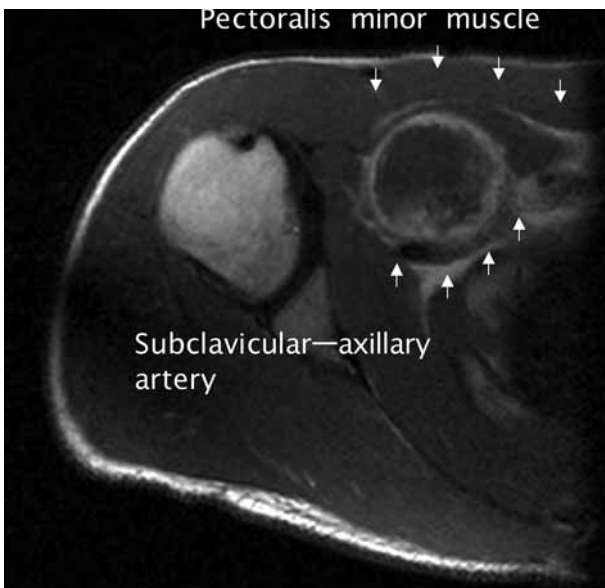


Fig. 2. — T1-weighted MRI showed a cystic lesion with a thick capsule beneath the pectoralis minor muscle and compression of the subclavicular-axillary artery was seen in horizontal section.

arm. These clinical findings indicated a thoracic outlet syndrome caused by the tumour. T1-weighted magnetic resonance imaging (MRI) showed a

cystic lesion with a thick capsule in the pectoralis minor space beneath the pectoralis minor muscle, and compression of the subclavicular and axillary arteries and veins on horizontal section (fig 2). The tumour was shown to be connected with the brachial plexus in sagittal section (fig 3), and was suggested to be a neurogenic tumour.

Finally, we diagnosed the tumour as a neurilemmoma causing thoracic outlet syndrome and decided on excision of the tumour. The operation was performed via the axillary approach. The tumour was attached to the lateral fascicles of the brachial plexus (fig 4), and was excised without disturbing the nerve fascicles. The tumour was mostly cystic and part of it consisted of a yellowish solid mass (fig 5). Pathological findings indicated a neurilemmoma, which showed the pattern of alternating Antoni A and B areas. Antoni A areas were composed of compact spindle cells and showed whorls of cells, while Antoni B areas were far less orderly and less cellular (fig 6). The patient's postoperative course was uneventful. The paraesthesia of the hand had recovered by the day after surgery, and the patient was discharged on the sixth postoperative day with excellent relief of symptoms.



Fig. 4. — The tumour was attached to the lateral fascicles of the brachial plexus.



Fig. 5. — Transverse section of the tumour. It was mostly cystic and consisted partially of a yellowish solid mass.

DISCUSSION

Neurilemmoma is relatively uncommon, and in the peripheral nervous system these tumours are usually found in association with one of the main nerves of the limbs. Pain and neurological symptoms are uncommon in most cases.

Thoracic outlet syndrome was defined in 1956 by Peet *et al* who united cervical rib syndrome, scalenus syndrome, and hyperabduction syndrome (5). Three anatomical structures are responsible for this syndrome ; 1) the scalene triangle,

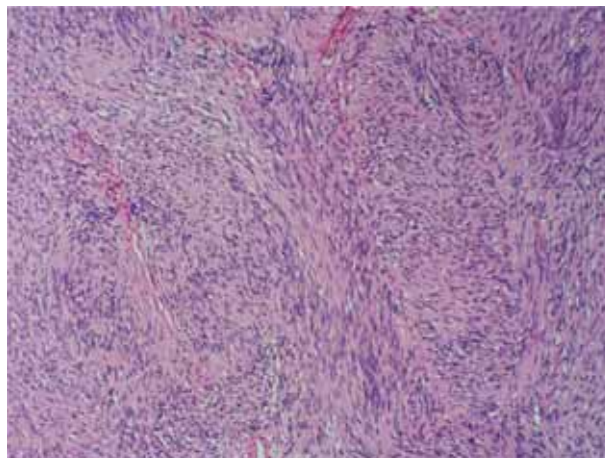


Fig. 6. — Pathological findings showed a pattern of alternating Antoni A and B areas. Antoni A areas were composed of compact spindle cells and showed whorls of cells, while Antoni B areas were far less orderly and less cellular (Haematoxylin-eosin staining ; $\times 100$).

2) the costoclavicular space, and 3) the pectoralis minor space. Stenosis of these areas causes compression of the brachial plexus, but Pang and Wessel, who reviewed the literature, found no reports of brachial plexus tumours causing thoracic outlet obstruction (4). There have been only three case reports of neurilemmomas as cases of thoracic outlet syndrome. McAllister *et al* presented the first case report of thoracic outlet compression syndrome caused by a schwannoma in the T1 nerve root in 1989 (3). Atasoy described the syndrome caused by a schwannoma of the C7 nerve root in 1997 (1). Hornic *et al* reported a case of neurilemmoma originating from the T1 nerve root in the left superior mediastinum as the cause of combined thoracic outlet and Horner's syndrome (2). Although these authors did not clearly mention the sites of stenosis, it is likely in these cases that the site of stenosis was the scalene triangle as the tumours originated from the T1 nerve root, C7 nerve root, and T1 nerve root respectively.

To our knowledge, this is the first report of a neurilemmoma originating from the lateral fascicles of the brachial plexus in the pectoralis minor space causing thoracic outlet syndrome.

REFERENCES

1. **Atasoy E.** Thoracic outlet compression syndrome caused by a schwannoma of the C7 nerve root. *J Hand Surg* 1997 ; 22-B : 662-663.
2. **Hornick P, John L C HY, Murray A et al.** Neurilemmoma as a cause of combined thoracic outlet and Horner's syndrome. *Thorac Cardiovasc Surg* 1991 ; 39 : 232-233.
3. **McAllister RMR, Watkin G, Adiseshiah M.** Unusual cause of thoracic outlet syndrome. *Br J Surg* 1989 ; 76 : 1257-1258.
4. **Pang D, Wessle HH.** Thoracic outlet syndrome. *Neurosurgery* 1988 ; 22 : 105-121.
5. **Peet MR, Henriksen JD, Anderson TP et al.** Thoracic outlet syndrome ; Evaluation of a therapeutic exercise program. *Proc Staff Meeting Mayo Clinic* 1956 ; 31 : 281-287.