

Ganglion causing paralysis of the suprascapular nerve

Diagnosis by MRI and ultrasonography

Kenji Takagishi¹, Kenji Maeda¹, Toshiaki Ikeda², Moritoshi Itoman¹ and Makoto Yamamoto¹

A 26-year-old man had a right infraspinatus muscle weakness and aching of the shoulder due to suprascapular nerve entrapment confirmed by electromyography. MRI revealed a well-defined area of increased signal intensity over the suprascapular notch. An ultrasonogram showed a homogeneous hypoechogenic area at the base of the scapular

spine. A diagnosis was made of a ganglion compressing the inferior branch of the suprascapular nerve. After removal of several ganglia, the patient had immediate pain relief, and normal electromyographic findings were obtained 5 months postoperatively.

Departments of ¹Orthopedics and ²Radiology, School of Medicine, Kitasato University, 1-15-1, Kitasato, Sagami-hara, Kanagawa, 228 Japan. Tel +81-427 78 8022. Fax +81-427 78 8441
Submitted 91-03-26. Accepted 91-05-25

Suprascapular nerve entrapment can be caused by various pathologic conditions, including anomalies of the suprascapular notch, fractures of the scapula, and ganglia pressing on the nerve (Post and Mayer 1987). Of these, a ganglion in the shoulder region with suprascapular nerve compression is uncommon (Ganzhorn et al. 1981, Hirayama and Takemitsu 1981, Thompson et al. 1981, Neviaser et al. 1986, Hama et al. 1988). We report such a case of a cyst diagnosed preoperatively by MRI and ultrasonographic scanning.

Case report

A 26-year-old, right-handed Japanese man was referred with a 2-month history of dull aching and weakness of the right shoulder. There was no history of trauma. He had wasting of the right infraspinatus muscle and weakness of external rotation and abduction of the right shoulder. A radiograph and arthrogram of the shoulder were normal. Electromyographic and nerve-conduction studies demonstrated only an isolated partial denervation of the right infraspinatus muscle. A MRI revealed a well-defined area of increased signal intensity over the suprascapular notch of the right scapula in T2-weighted images (Figure 1). Ultrasonography was performed twice. In the first study, only atrophy of the infraspinatus muscle was demonstrated. On the second ultrasonogram, which was made after the results of MRI were obtained, a

homogeneous hypoechogenic area was demonstrated at the base of the scapular spine (Figure 2). No abnormalities were seen in the supraspinatus fossa and in the scapular foramen. A diagnosis was made of a cyst compressing the inferior branch of the suprascapular nerve.

Upon operative exploration, a 1.5 × 3-cm ganglionic cyst, which appeared to have arisen from the fibrous tissue on the scapula itself or from the posterior capsule of the shoulder, was found, with compression of the inferior branch of the suprascapular nerve and the suprascapular artery (Figure 3). More than 10 ganglia of less than 2 mm in size were seen in the posterior capsule of the shoulder. The ganglia were removed, and the nerve was left intact. The pathology was consistent with a ganglionic cyst.

After the operation, the patient immediately had decreased pain; and 5 months postoperatively, normal electromyographic findings were obtained. However, when the patient was last seen 1 year after the operation, there were mild atrophy of the infraspinatus muscle and slight weakness during external rotation and abduction. No evidence of local recurrence was found on the ultrasonogram.

Discussion

The mixed suprascapular nerve (C4 to C6) arises from the upper trunk of the brachial plexus. After passing



Figure 1. Two cystic structures are seen on a magnetic resonance scan.

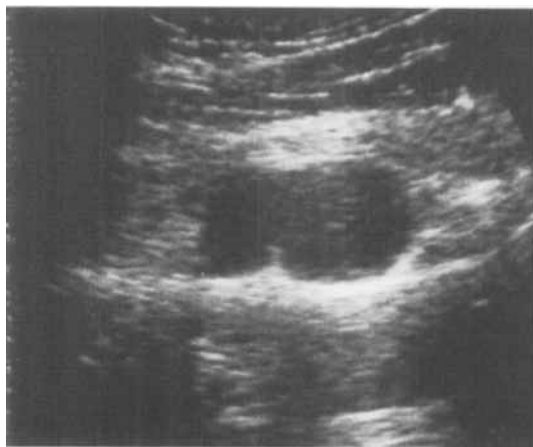


Figure 2. Cystic lesions are demonstrated on an ultrasonogram.

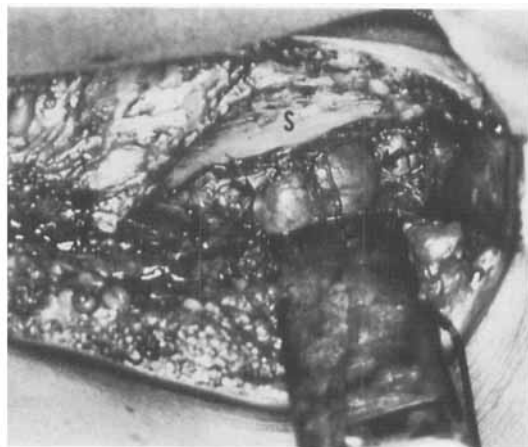


Figure 3. Intraoperative photograph showing ganglia in the region of the spinoglenoid notch and in the posterior capsule of the shoulder. S: spine of the scapula.

through the suprascapular foramen, it innervates the supraspinatus muscle and provides articular branches to the shoulder and acromioclavicular joint. The nerve courses laterally and inferiorly around the spinoglenoid notch to innervate the infraspinatus muscle in the infraspinatus fossa.

The exact cause and location of compression of the suprascapular nerve are difficult to determine; and in many cases the lesion probably represents a traction neuropraxia or axonotmesis—which will usually recover if given sufficient time—rather than a true entrapment neuropathy caused by lesions, such as a ganglion, which requires surgical decompression

(Drez 1976). There is a clinical problem in the differentiation between patients who have rotator cuff tears and those with suprascapular nerve lesions. Both types of patients have problems abducting the shoulder in the presence of strong deltoid contractions, and both may manifest considerable atrophy of infraspinatus muscles. Electromyographic studies and arthrography are useful for differentiating one lesion from another. However, the exact cause of the suprascapular nerve entrapment is not shown by these tests. On the other hand, MRI and ultrasonographic scanning are effective means for making a diagnosis of rotator cuff tear (Middleton et al. 1985, Seeger et al. 1988). Hama et al.

(1988) first reported that ultrasonography scanning is a useful diagnostic method for disclosing a ganglionic cyst that is causing suprascapular nerve entrapment. A space-occupying lesion in the spinoglenoidal notch, but no abnormality of the rotator cuff, was shown in our patient. Taken together, these examinations can be useful for determining the diagnosis and location of a ganglion causing suprascapular nerve entrapment, as well as for the diagnosis of a rotator cuff tear.

References

- Drez D Jr. Suprascapular neuropathy in the differential diagnosis of rotator cuff injuries. *Am J Sports Med* 1976; 4 (2): 43-5.
- Ganzhorn R W, Hocker J T, Horowitz M, Switzer H E. Suprascapular nerve entrapment. *J Bone Joint Surg (Am)* 1981; 63 (3): 492-4.
- Hama H, Yamamuro T, Iida H, Tada K, Yoshida M. Suprascapular nerve palsy due to a ganglion: A case report. *Seikeigeka* 1987; 38 (4): 511-4.
- Hirayama T, Takemitsu Y. Compression of the suprascapular nerve by a ganglion at the suprascapular notch. *Clin Orthop* 1981; 155: 95-6.
- Middleton W D, Edelstein G, Reinus W R, Melson G L, Totty W G, Murphy W A. Sonographic detection of rotator cuff tears. *AJR Am J Roentgenol* 1985; 144 (2): 349-53.
- Neviaser T J, Ain B R, Neviaser R J. Suprascapular nerve denervation secondary to attenuation by a ganglionic cyst. *J Bone Joint Surg (Am)* 1986; 68 (4): 627-8.
- Post M, Mayer J. Suprascapular nerve entrapment. Diagnosis and treatment. *Clin Orthop* 1987; 223: 126-36.
- Seeger L L, Gold R H, Bassett L W, Ellman H. Shoulder impingement syndrome: MR findings in 53 shoulders. *AJR Am J Roentgenol* 1988; 150 (2): 343-7.
- Thompson R C Jr, Schneider W, Kennedy T. Entrapment neuropathy of the inferior branch of the suprascapular nerve by ganglia. *Clin Orthop* 1982; 166: 185-7.