Entrapment Neuropathy of the Inferior Suprascapular Nerve in a Weight Lifter

Rick W. Wilson

Suprascapular nerve palsy has been frequently reported in athletes, particularly baseball pitchers, volleyball players, and weight lifters, but it is easily overlooked during the evaluation of shoulder pain. Entrapment of the suprascapular nerve is usually suspected only after atrophy is noted. The presence of painless weakness of the external rotator muscles should alert the clinician to the presence of nerve damage, which can be confirmed by electromyography. This case study demonstrates the usefulness of isokinetic testing and magnetic resonance imaging in identifying cystic lesions causing neuropathy among athletes who have failed conservative treatment for shoulder pain.

A 28-year-old male developed pain in the posterior aspect of the nondominant left shoulder. This period coincided with peak weight training volume during preparation for a competition scheduled for the following month. Symptoms appeared without antecedent injury and were progressively exacerbated by weight training. The pain was quite severe at first, forcing the patient to discontinue upper extremity weight training due to the intensity of his symptoms. His pain gradually diminished to a mild aching during a 4-week period of rest but failed to resolve completely.

The patient was referred to physical therapy for rehabilitation of left glenohumeral joint instability at about 8 weeks after the onset of symptoms. Examination revealed a muscular white male whose previous medical history was unremarkable except for a training diet high in amino acid supplements. The patient neither smoked or drank. Cervical range of motion was normal and painless. Upper extremity sensation was intact and reflexes were normal. Detailed evaluation of the shoulder demonstrated full active range of motion with a painful arc of active abduction. Painless weakness (4/5) was evident during a manual muscle test of the left external rotator group. Strength of the isolated supraspinatus (Jobe's test) was normal. Isokinetic testing (30°/s) revealed external/internal rotator torque ratios of 35% at the left shoulder and 62% at the unaffected right.
shoulder. The patient was referred to a neurologist for electrodiagnostic testing to rule out a suprascapular nerve palsy and was started on a strengthening program consisting of isometrics and gentle resistive exercises using rubber tubing. Electromyography (EMG) and nerve conduction studies identified isolated denervation of the left infraspinatus. No abnormalities were found in the supraspinatus.

At 3 months post onset, the patient’s symptoms had subsided to the point that he was able to perform isokinetic strengthening in concentric and eccentric modes three times weekly without discomfort. However, over the next 6 weeks his strength failed to improve. The isokinetic external/internal rotator torque ratio was 39%, compared to the 35% baseline ratio established during the initial evaluation. Obvious atrophy of the infraspinatus and apparent hypertrophy of the supraspinatus and teres minor were observed. Following orthopedic consultation, magnetic resonance imaging (MRI) was obtained demonstrating a cystic mass near the posterior glenoid neck, and the patient was scheduled for surgery. Subsequently, a 2 cm by 3 cm mucinous cyst was excised from the posterior-inferior aspect of the left glenoid. During this procedure, the deltoid was split from the level of the scapular spine distally for 5 cm, and the superior aspect of the infraspinatus was reflected to reveal the glenoid neck. The cyst was easily removed and no tendrils to the glenohumeral or acromioclavicular joints were found. The patient tolerated the procedure well, experiencing no additional postoperative weakness or paresthesias.

Rehabilitation was resumed after 1 week of immobilization in a sling. Active-assisted range of motion and isometric strengthening were initiated at that time. Sutures were removed at 2 weeks. The patient was able to progress to isokinetic strengthening without pain by the 4th postoperative week. By the 4th postoperative month he had attained an isokinetic external/internal rotation torque ratio of 67% and was able to return to weight training. A follow-up EMG was recommended but declined by the patient.

Discussion

A review of the literature reveals several reports of suprascapular nerve palsy in athletes (1, 2, 4, 6, 8–10). In four of these case studies, suprascapular nerve palsy was specifically associated with weight lifting (2, 6, 8). Ganglion cysts were surgically identified as the source of nerve injury in two of these cases (6, 8). In the two remaining cases reported by Black and Lombardo (2), symptoms resolved without surgical intervention and the source of the entrapment was not determined.

The increasing availability of magnetic resonance imaging has provided additional evidence linking cystic lesions to suprascapular nerve palsies. Using MRI, Fritz et al. (5) identified 27 masses associated with suprascapular nerve lesions. Eleven cases (40%) involved atrophy of both the supraspinatus and infraspinatus, while nine (33%) were associated with isolated infraspinatus atrophy similar to this case. Among these 27 masses, there were 21 ganglion cysts, two synovial sarcomas, one Ewing sarcoma, one chondrosarcoma, one renal cell carcinoma, and one hematoma associated with scapular fracture. Weight lifters comprised 7 of the 21 patients with ganglion cysts.

Reports describing compression of the motor branch of the suprascapular
nerve to the infraspinatus have also implicated the inferior transverse scapular (spinoglenoid) ligament (1, 2, 4, 7). However, surgical confirmation of this speculation has been offered in only two cases (1, 7). After dissecting 75 shoulders of 39 cadavers, Demaio et al. (3) were able to isolate this structure in only 3% of the specimens and discounted the role of the inferior transverse scapular ligament in this condition. These authors suggested that isolated infraspinatus denervation may also result from crush injury, traction from eccentric contraction of the infraspinatus, or thrombosis of the vasa nervorum.

Summary

This study supports previous findings that cystic masses appear to be responsible for a significant number of suprascapular neuropathies, especially among weight lifters. In this case, the painless weakness was identified during the initial clinical evaluation, and inferior suprascapular nerve palsy was confirmed by EMG. Although the patient was asymptomatic during normal activity after 6 weeks of rehabilitation, he was unable to return to weight lifting due to pain. Serial isokinetic testing revealed that external rotator torque had failed to increase significantly from baseline values. Further evaluation using MRI identified a cyst near the spinoglenoid notch that ultimately required surgical excision. Following surgery, the patient regained normal external rotator strength and returned to weight lifting.

References