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Current trends in management of Suprascapular Nerve entrapment

Introduction:

Suprascapular nerve injuries have become increasingly recognized as a cause of shoulder pain and dysfunction¹. Recent advances in diagnostic and surgical techniques have simplified the management of injuries of this nerve. The purpose of this article is to provide a simplistic overview of this condition for medical practitioners and patients.

Historical aspects:

Kopell and Thomson are often credited with the first description of suprascapular nerve injuries; however, the earliest mention of this condition is found in the works of André Thomas.

What, and where, is the suprascapular nerve?

The suprascapular nerve is one of the several nerves that originate in the brachial plexus (nerves arising from the neck). The nerve passes through a small notch/tunnel in the scapula (the bone that forms the shoulder blade), and then through a second tunnel (spinoglenoid notch). Thereafter, it makes its way to the back of the shoulder. (Figure 1) Here it provides sensation to some parts of the shoulder (ligaments, bursa, AC joint), and sometimes to skin of upper arm. The main supply of the nerve is to two important muscles of the rotator cuff of the shoulder, viz. Supraspinatus, and Infraspinatus. (details in section on Rotator Cuff)

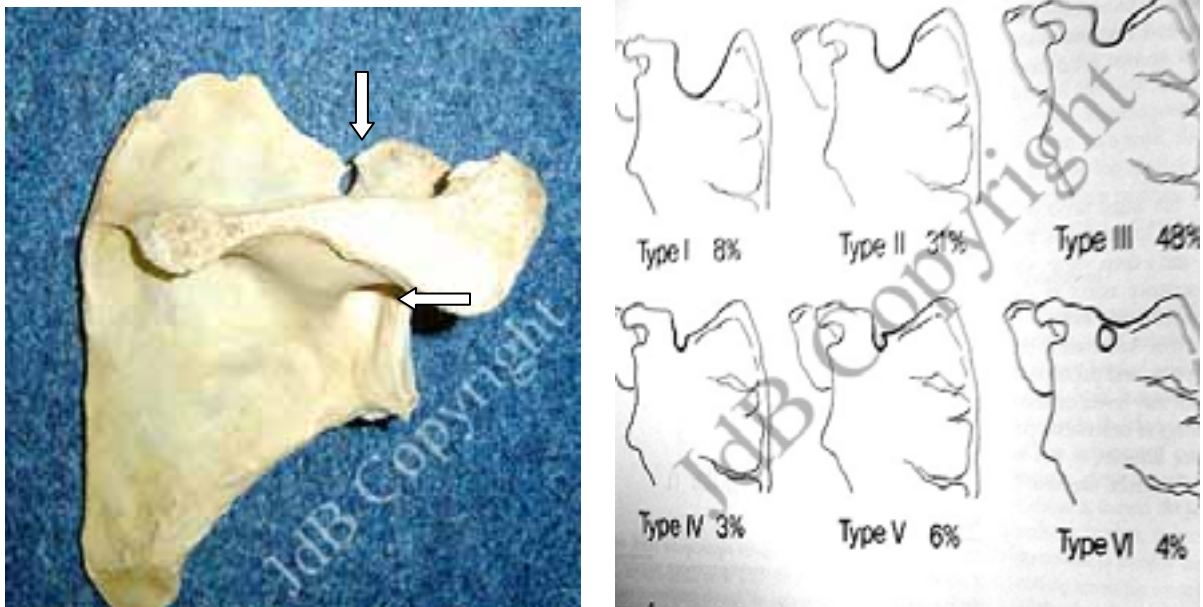
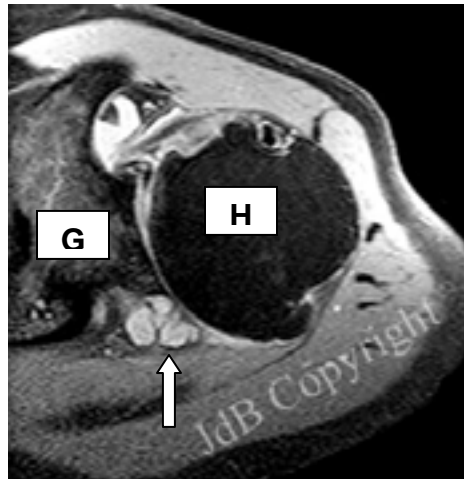


Figure 1: Left: The bone that forms the shoulder blade (scapula) is shown. Arrows show the tunnels where the nerve is usually trapped. **Right:** Different types of tunnels/ notches are shown.

How can this nerve get injured?

The following causes of suprascapular nerve injury have been recognized:

1. Trauma: Fractures of Scapula (shoulder blade), collar bone (clavicle), shoulder dislocations, and gunshot/ stab injuries.
2. Iatrogenic (during surgery): During repair of large, old tears of the rotator cuff.
3. Repetitive overuse: repeated overhead use of the arm injures the nerve against the roof of the one of the two tunnels (suprascapular ligament, spinoglenoid ligament). eg, in volleyball / baseball / tennis / football players, fencers, figure skaters, dancers, weight-lifters, and hunters who use a bow,
4. Tumors around the nerve may compress it, eg. cysts.



MRI of the shoulder joint with ball (H) and socket (G). Arrow shows a tumor (Cyst) compressing the nerve in one of the tunnels.

What happens when the suprascapular nerve is injured?

The typical patient is between the ages of 20 and 50 years. The dominant shoulder is usually involved.

The main complaint is PAIN, which is dull, and the patient points to the back of the shoulder when asked to localize. The pain may increase when using the arm for overhead activities. Some patients may have little or no pain.

WEAKNESS and WASTING (Thinning, “withering away”) of shoulder muscles at the back of the shoulder is always present. (Figure 2). This is important to remember, as a substantial number of patients may have little, or no pain.



Figure 2: Arrows show wasting of muscles.

How does the physician/ surgeon diagnose this condition?

The diagnosis should be SUSPECTED in any patient between 20 to 50 years of age, involved in overhead activities/ sports , or in an accident involving the shoulder (see list above), with pain and muscle wasting around the back of the shoulder.

Once suspected, the strength of the specific shoulder muscles should be tested and documented. This should be done preferably with a special instrument, eg. ISOBEX dynamometer. (Figure 3).

A specialized muscle test, called EMG (electromyography) can confirm the injury, and can pinpoint the exact site where the nerve is injured. This is also important to assess recovery after treatment. (Figure 4).

Imaging methods include ultrasound, and MRI (magnetic resonance imaging). (Figure 5a and 5b).



Figure 3: ISOEX for testing muscle strength.



Figure 4: EMG for testing activity.



Figure 5a: Ultrasonography shows a cyst at the spinoglenoid notch.



Figure 5b: MRI shows a SLAP tear, which is sometimes associated with compression of the nerve.

How is this injury treated?

Suprascapular nerve injury may be treated **without surgery**, in some patients, by avoiding overhead activities, and rehabilitation of muscles. **HOWEVER**, although some patients may improve, the overall success rate is unknown, and recovery cannot be predicted¹.

Surgical treatment depends on the cause. The specific cause is treated (eg, tumor, fracture) and the nerve is released from the tunnel that has trapped the nerve. Usually, the release is

performed at the suprascapular notch (the first tunnel) and sometimes at the spinoglenoid notch (the second tunnel).

In most surgical centers, the surgery is performed **OPEN**, ie. by incising the skin, muscles, and surrounding tissues to gain access to the nerve. Recent advances in arthroscopy have made this surgery possible by Endoscopic methods, ie. **KEYHOLE surgery**. However, at present, this technique is available only in selected centers in the world²⁻⁶. The keyhole technique is postulated to permit better visualization of the nerve and its blood vessels, as well as the exact site of compression, thereby leading to greater accuracy in releasing the injured nerve. (Figure 6).

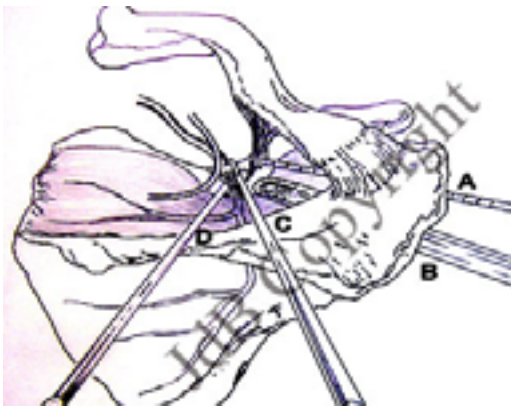


Figure 6a: Technique of arthroscopic decompression of SS nerve.



Figure 6b: The ligament is cut with a special instrument through a keyhole, and is seen on the monitor.

What are the results of surgery?

Surgical release of the suprascapular nerve is associated with a high rate of pain relief and functional improvement. However, resolution of muscle wasting is less predictable^{1,6}.

Suggested reading:

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