

Lesions of the Posterior Branch of the Axillary Nerve: Common, but not previously Described: A New Syndrome?

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Abstract

A previously undescribed syndrome following a shoulder injury encountered both in clinical and medico-legal practice is diagnosed as a neurological injury.

Introduction

The literature tells us that axillary nerve lesions are common in association with dislocations of the shoulder or fractures of the proximal humerus. Most of these lesions (due to neuropraxia) recover completely within a year. The literature also tells us that apart from these two situations axillary nerve lesions are uncommon. The aim of this paper is to indicate that lesions of the posterior branch of the axillary nerve are quite common, and the diagnosis is simply being missed. These patients usually present following a shoulder injury with persistent shoulder pain for which no obvious cause can be found but is frequently attributed to impingement. The key to making the diagnosis is the finding of diminished sensation over the deltoid muscle in the area supplied by the axillary nerve.

Material

The material for this review is a collection of 52 cases, with a gender bias male: female = 3:2.

Mechanism of injury

The commonest mechanism of injury in these cases is a history of traction to the shoulder, either by trying to prevent a heavy load from falling or simply lifting a load being unexpectedly heavy.

Anatomy of the Axillary Nerve

The axillary nerve is a branch of the posterior cord of the brachial plexus (C5 and C6) which passes backwards through the quadrilateral space together with the posterior humeral circumflex artery. The space is bounded superiorly by the teres minor muscle, inferiorly by the teres major muscle, medially by the long head of triceps and laterally by the humeral shaft (**Figure 1**).

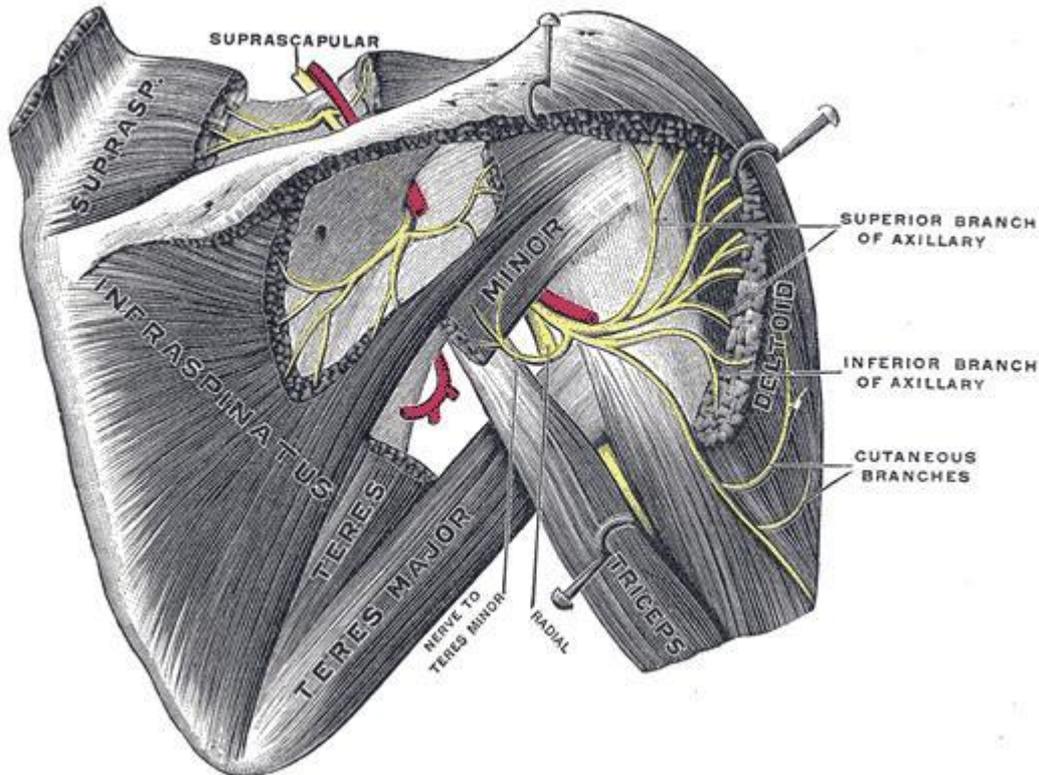


Figure 1: Space is bounded superiorly by the teres minor muscle, inferiorly by the teres major muscle, medially by the long head of triceps and laterally by the humeral shaft.

Distal to the subscapularis muscle the nerve divides into anterior and posterior branches. The anterior branch contains all the fibres that supply the anterior and lateral deltoid muscle. The posterior branch contains the majority (and sometimes all) of the fibres to the posterior deltoid *as well as all the sensory fibres*. Note that lesions of the axillary nerve itself, if severe enough, will result in wasting of the whole of the deltoid muscle, whereas lesions of the posterior branch of the nerve, only involve the posterior deltoid.

Diagnosis

There are three clinical signs that help to make the diagnosis:

- Diminished sensation over the deltoid (a sign without which one cannot make the diagnosis i.e., it is present in every case) (**Figure 2**).
- A localised area of tenderness posteriorly over the course of the axillary nerve in relation to the lower part of the glenohumeral joint, present in about two-thirds of cases

- Wasting of the posterior deltoid is present in about one-third of cases (Figure 2). Compare this appearance with the normal rounded right shoulder in the same patient (Figure 3).

The following clinical testing is therefore recommended:

- Careful sensory testing over the deltoid
- Careful palpation of the posterior joint line
- Inspection of posterior deltoid bulk

These tests should be carried out in all cases of ‘non-specific’ post-traumatic shoulder pain. The diagnosis may be confirmed by electrophysiological and electromyographic tests.

Case Study 1

A 42-year-old woman in good general health, working in the fashion industry sustained a traction injury to her left shoulder in February 2011. When examined in 2015 had the clinical signs noted above, namely sensory loss over the deltoid, wasting of the posterior deltoid and localised tenderness over the posterior joint line.



Figure 2: Diminished sensation over the deltoid.



Figure 3: Normal rounded right shoulder in the same patient.

Motor and sensory nerve conduction studies carried out in August 2020 reported electrophysiological abnormalities consistent with a partial left posterior axillary nerve lesion.

Conclusion

- The author presents a previously unrecognised syndrome with three objective signs.
- Conservative treatment had been unsuccessful, and most patients had had decompressive surgery carried out without improvement.
- The tests described should be carried out in all cases of ‘non-specific’ post-traumatic shoulder pain, in the hope that the correct diagnosis would save many patients from inappropriate subacromial surgery.

The importance of this condition is that its ‘non-diagnosis’ may ‘explain’ why ill-advised but frequently undertaken subacromial decompression for isolated so-called ‘sub-deltoid bursitis’ reported on ultrasound or MRI, frequently fails to relieve associated symptoms.

References

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