



Brachial Plexus Impingement (Thoracic Outlet Syndrome)

A nerve bundle in the neck and upper chest is trapped and compressed, most likely by a lower neck muscle or an upper chest muscle. Sometimes an artery close by is also compromised.

The *brachial plexus* is a nerve bundle formed from the grouping together of all of the nerve roots arising from the spine in the region of the lower neck and very upper part of the back, from the fifth cervical vertebra and extending into the first thoracic vertebra. See Figure 1 overleaf.

This bundle ultimately divides into recognisable peripheral nerves; the *radial* nerve, the *median* nerve, the *ulnar* nerve and a number of other less well known and smaller nerves which supply the arm. The brachial plexus is prone to compression or impingement.

Impingement of the brachial plexus is often referred to as either *thoracic outlet syndrome* or *thoracic outlet obstruction*.

(a) Symptoms of Brachial Plexus Impingement

Pain

The result of impingement or compression of the brachial plexus is *pain* that radiates down the arm and into the hand and fingers. The pain is often very debilitating.

The *quality* of the pain is similar to that experienced in *nerve root compression* (where the nerve is compressed right where it exits the spine) following *herniation* or *prolapse* of an *intervertebral disc*. You may need to ask your practitioner to explain the terms herniation, prolapse and intervertebral disc.

However the *distribution* of the pain does not follow any pattern typical of nerve root compression at the level of the spine. Further the pattern of pain is more widespread than it would be if a single *peripheral* nerve were involved (such as the radial, median or ulnar nerve). The pain is so widespread because the nerves are impinged at a point which involves *all* of them.

Compromised Circulation

The subclavian artery (which supplies the arm and hand) follows the path of the brachial plexus fairly closely, and if the brachial plexus is compressed strongly enough, circulation to the arm and hand may be compromised. The hand may look a little blue.

(b) Causes of Brachial Plexus Impingement

There are three main causes of *brachial plexus* impingement.

1. *Pancose Tumour of the Lung*. This is a medical emergency. You do not have this problem. If you did, your practitioner would have referred you straight to a medical practitioner.
2. *Cervical Rib*. If your practitioner believes you have this problem, you may be referred to a medical practitioner, as surgery may be required to correct the problem.
3. *Muscle Tension or Spasm*. The brachial plexus may be impinged by a tight muscle.

Compression by Muscle Tension or Spasm

The brachial plexus may be compressed by either of *scalenus anterior* or *pectoralis minor* because both the *brachial plexus* and the *subclavian artery* pass under *both* of these muscles.

See Figure 1 and Figure 2 below. If tight, either one may exert undue pressure and compromise the nerve plexus *and* if the compression is severe enough, the artery as well.

Figure 1: Brachial Plexus in Relation to Scalenus Anterior and Pectoralis Minor

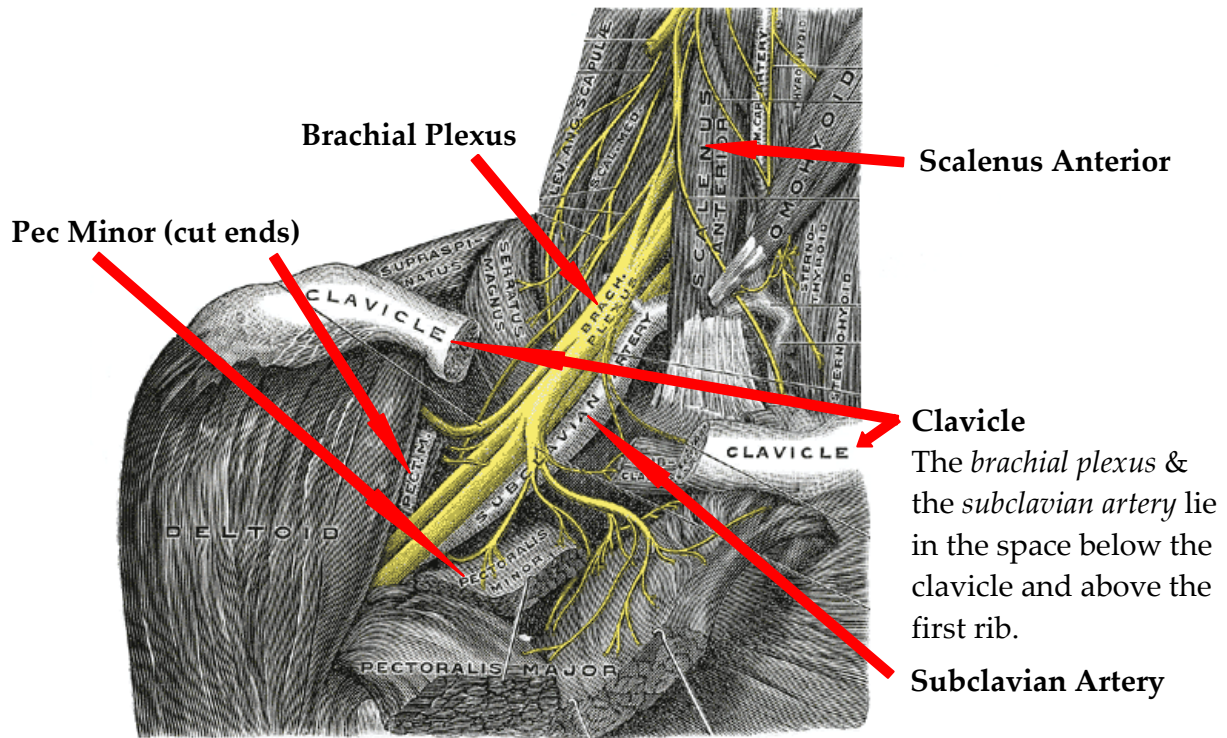
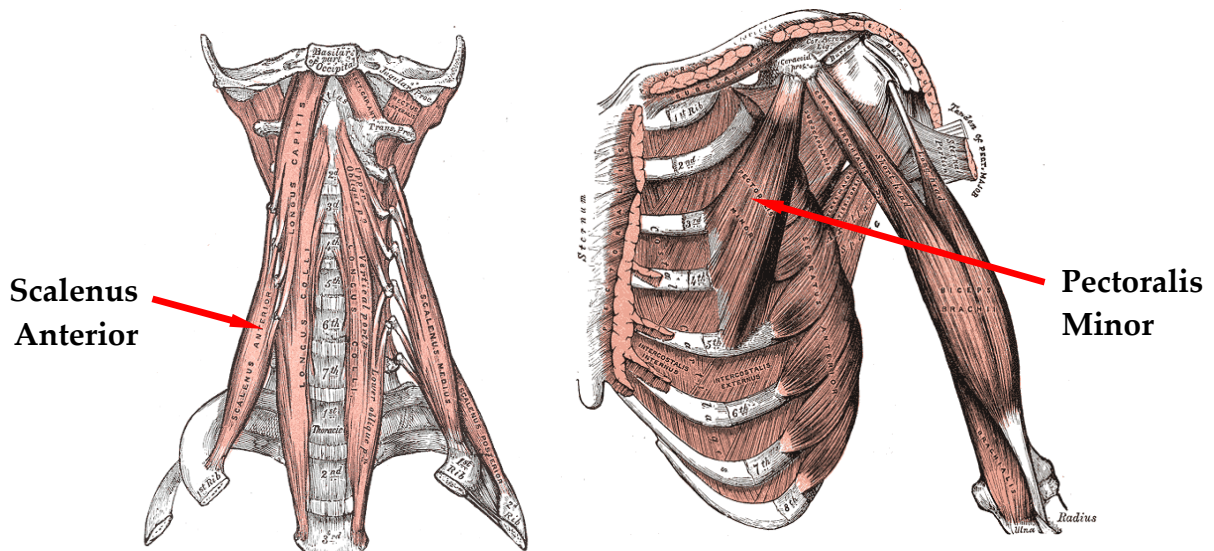


Figure 2: Scalenus Anterior and Pectoralis Minor in Arm-Hand Pain



(c) Treatment

Your practitioner will release *scalenus anterior* and *pectoralis minor* to make sure any brachial plexus impingement due to muscle tension is eliminated. Improvement is generally *immediate*.