

Shoulder impingement syndrome

Description

Impingement syndrome is considered to be a situation in which there is pain with shoulder motions of abduction and flexion above chest height, internal rotation of the shoulder and protraction of the shoulder. This condition may occur in all age groups whether or not there is accompanying degeneration or pathology of the rotator cuff, labrum or biceps tendon. One study noted that conditions such as supraspinatus pathology were primarily age related in a group of people with impingement syndrome (Frost et al. 1999).

Symptoms

With impingement syndrome, there is pain with motion as described above. There is not necessarily weakness as demonstrated with objective tears of the rotator cuff. Impingement pain may reflect inflammation in the structures of the subacromial bursa which has a much denser population of pain receptors than do other structures in the shoulder (Soifer et al. 1996).

Impingement may reflect inflammation associated with a sprain injury of the rotator cuff structures, irritation of the bursa and/or the bursal surface of the rotator cuff when there are osteophytes on the under surface of the acromial arch or when the acromion itself limits the amount of space available for the underlying tissues.

Acromial structure can be described as three different types:

- A type I acromion is considered to be quite flat with little restriction in the caliber of the subacromial arch.
- A type II acromion is considered to be one that in which the acromion has a down-sloping character.
- A type III acromion is considered to be present when there is significant downward hooking of the acromion consequently greatly restricting the caliber of the subacromial arch area.

Some studies have suggested impingement and progressive degenerative rotator cuff tearing may be correlated with the greater degree of acromial arching in type II and even more with type III acromions. One of the difficulties of this concept though, is that there is often poor inter-observer reliability in the interpretation of imaging studies. With more sophisticated imaging interpretation techniques, this may now be less problematic than it had been in the past. Although

there may be excess fluid within the bursa with inflammation, seemingly large amounts of fluid may be found in the bursa of asymptomatic people as well. Ultrasound reports often comment there is impingement of the rotator cuff on dynamic imaging studies. This may indicate a potential for impingement. However, clinical correlation with ultrasound imaging of this nature is poor.

Exam

For these reasons, impingement is primarily diagnosed on a clinical basis. To diagnose impingement, there must be pain with internal rotation of the humeral head in positions where there is significant decrease in the caliber of the subacromial space and/or supraspinatus outlet. The most common clinical tests for impingement are Neer's test and the Hawkins-Kennedy test. Forceful flexion, abduction and protraction of the shoulder can also result in similar pain.

To differentiate impingement from other shoulder conditions pain by itself is a poor discriminator. If there is actual weakness associated with motions such as flexion, abduction and protraction, a rotator cuff tear may be present. With weakness of biceps motions or point pain over the bicipital groove on the anterior aspect of the shoulder, a biceps tear may be present. With clunking and a sense of instability the underlying condition may well be a labral tear.

When there is overt weakness or instability present, specialized imaging may be indicated.

Causation

Impingement reflects a situation in which inflammation of the shoulder is present in conjunction with compression of structures under the subacromial arch. It can start suddenly, after an injury, or more commonly comes on gradually (from middle age onwards) unrelated to any obvious cause. Impingement may arise following an acute strain injury of the shoulder or from prolonged forceful activity with the arms elevated, abducted, protracted, internally rotated or a combination of these postures. These are commonly associated with recreational activities such as swimming, racquet sports, or strength training. Predisposing factors can include age, genetics, shoulder anatomy, degenerative conditions such as osteoarthritis and rotator cuff tendinopathy, and previous shoulder injuries.

Treatment

Regardless of the configuration of the acromion, the most practical way to think of impingement syndrome is that there is inflammation of the tissues in the space underlying the acromial arch. The primary structures involved are the supraspinatus muscle tendon complex and the subacromial bursa. Once impingement pain and swelling sets in, the vicious circle of inappropriate activity, inflammation, swelling, impingement and pain can become entrenched and difficult to treat.

Phase one

The initial treatment is conservative with stopping forceful shoulder use and avoiding overhead activity. Anti-inflammatory medication can be useful. Physiotherapy is helpful to retrain shoulder motion and improve strength into a more functional manner.

If initial conservative therapy is not fully effective, sub-acromial steroid injections are both therapeutic and diagnostic. If the injection into the sub-acromial space results in significant relief of pain during the injection appointment, this is good diagnostic evidence that there is impingement pain present. The function of steroids in this situation is to reduce the degree of swelling and inflammation present.

During the period of reduced pain following steroid injection, physiotherapy is important to strengthen the scapular and rotator cuff muscles to ensure that the humeral head is stable and positioned correctly in the humeral head. If an initial injection is not successful, injections with accompanying therapy can be repeated several times at one-month intervals. The effects of steroids are temporary, and their function is simply to allow inflammation and swelling to settle. Persistent impingement pain despite appropriate conservative therapy may indicate the presence of a more enduring mechanical impingement.

Phase two

If the first two phases of treatment are not effective, surgical assessment is the most usual next step. There is controversy in the orthopedic literature whether surgery is indicated at all when there is no obvious pathology present. Neer, the orthopedic surgeon who did much of the initial work on impingement, cautioned that surgery not be performed until at least a year had passed (Neer, 1983). Several trials and meta-analyses have demonstrated that surgery after failed conservative therapy does not have a better outcome than those without surgery (Ketola et. al. 2015, Dong et. al. 2015, Diercks et. al. 2014).

The initial phases of treatment are clear. The role of surgery is more difficult.

Other diagnoses

As noted above, a number of other diagnoses may present with shoulder pain. In fact inflammation of subacromial tissues such as the bursa may commonly accompany other diagnoses as well.

Rotator cuff tears of a significant degree may show weakness on resisted testing of rotator cuff function.

Frozen shoulder/adhesive capsulitis shows objective limitation of motion, especially in external rotation. The characteristic clinical finding is a firm anatomical reduction in range of motion of the shoulder. Frozen shoulder is frequently misdiagnosed when people are unwilling to do some motions due to pain. True frozen shoulder should occur with fibrosis of the capsule of the shoulder.

Shoulder instability can have accompanying pain. People with instability are apprehensive when the shoulder is externally rotated – especially with the arm abducted.

Neck problems may refer to the shoulder. The converse is also true as people with impingement frequently have a presenting concern of neck pain (Gorski & Schwartz, 2003).

Cancers of the neck, breast and axilla may present with pain referring to the shoulder.

Osteoarthritis of the shoulder may be painful, but imaging studies show poor correlation between pain and the presence of degeneration.

References

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