

## **Shoulder - Subacromial Impingement Syndrome**

Shoulder pain accounts for over 30% of physician visits for musculoskeletal pain in the United States. The prevalence of shoulder pain is 7-27% with a sharp increase in prevalence in persons aged over 50 years. Subacromial Impingement Syndrome (SAIS) is a frequent cause of shoulder pain. With summer fast approaching, overhead or repetitive loads such as gardening, DIY, swimming and throwing sports such as cricket and softball can often lead to the onset of SAIS.

SAIS is often characterised by painful functional limitation of the shoulder. It manifests in the subacromial space, between the humeral head inferiorly, and the superior acromion and coracoacromial ligament (figure 1). SAIS involves the entrapment and eventual compromise of the subacromial bursa or rotator cuff, either due to pathomechanics (bursitis, rotator cuff tendinosis or partial thickness tear), inflammatory or osseous protrusions into the subacromial space. Injury to the rotator cuff commonly involves the supraspinatus tendon, due to direct compression to the tendon within the subacromial space, and by tension overload applied to the tendon leading to tendon degeneration during repetitive activities. Therefore, it is important to highlight that SAIS is not a diagnosis, but a term given to pain arising from a structure within the subacromial space. The patient presenting with SAIS can often not recall a painful trauma, but further questioning into recent changes in routine can often highlight the reason for the onset of their symptoms.

Accurate and early identification of the factors causing the subacromial impingement symptoms is essential for appropriate management. This will establish whether the injury will respond to physiotherapy or require further intervention. Initial use of the ACC shoulder management algorithm will assist in identifying any red flags or indications for early referral. Differential diagnosis can be achieved by subjective and objective assessment tests used to load the subacromial structures, of which the impingement tests have been proven to have good reliability and diagnostic accuracy (1). Radiography and ultrasound imaging have also shown excellent correlation with diagnostic testing (1,2). It is important that both x-ray and ultrasound imaging are performed when indicated, to gain a complete diagnostic picture, including variances in the acromion and any osseous protrusions.

Repetitive overhead tasks, sedentary postures (characterised by increased thoracic kyphosis, protracted chin and rounded shoulders), poor work-place ergonomics, and poor lifting or training technique can compromise the integrity of the subacromial space and lead on to SAIS. Muscle imbalances in both the scapulothoracic and scapulohumeral regions can decrease the subacromial space. SAIS can be managed surgically or conservatively, although in the majority of cases conservative management precedes surgery (3). Early intervention for those presenting with mild impingement signs can include correction of scapula position through stretching and scapula stability exercises. Postural taping and cues like mirrors can also prove highly beneficial to provide biofeedback on correct postures, movement patterns and scapula position. Rotator cuff strength, specifically subscapularis, is important for maintaining glenohumeral depression. Those that present with more advanced stages of SAIS may also require other strategies such as joint mobilisation to assist with any glenohumeral joint capsular restriction, or acupuncture to desensitise painful structures. The key is early intervention to prevent the onset of any of these secondary conditions associated with the impingement.

A successful conservative outcome relies on the identification of factors that may be contributing to the onset of an individual's subacromial symptoms, and relies on compliancy with a rehabilitative programme. Early subacromial symptoms do respond well to conservative physiotherapy management with a good long term outlook.

## References:

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- Michener et al., (2009). Reliability and Diagnostic Accuracy of 5 Physical Examination Tests and Combination of Tests for Subacromial Impingement. *Archives of Physical Medicine and Rehabilitation*, 90. 1898-1903.
- Kelly et al., (2009). Clinical Outcomes of Exercise in the Management of Subacromial Impingement Syndrome: A Systematic Review. *Clinical Rehabilitation*, 24. 99-109.

## A Case Study

Lachlan is a 38 year old male. He presented to his GP with an 8 week history of right shoulder pain. Lachlan could not recall any traumatic event, but had noticed a gradual onset of anterior shoulder pain that was becoming increasingly more painful and stiff over the subsequent weeks. Lachlan recalled that he had been doing some extensive travelling for work in his sales role prior to this, which required him to repeatedly lift suitcases filled with clothing samples in and out of the car. Lachlan was now having difficulty reaching to put his seatbelt on, lifting his 4 year old son, drying his hair and tucking his shirt into the back of his trousers due to pain. He was unable to play his weekly social water polo match, as Lachlan had noted that throwing and swimming would increase his symptoms. Lachlan had no previous history of neck or shoulder injuries.

Lachlan was referred for physiotherapy. Lachlan described a dull ache pain over his anterior glenohumeral joint that became sharp with movement. Lachlan displayed bilateral scapula winging and a slightly elevated right scapula. He had very dominant right upper fibres of trapezius and levator scapulae musculature. Lachlan sat with an increased thoracic kyphosis, which he admitted was his normal seated posture in the car and at work. Lachlan had a loss of end of range glenohumeral joint flexion, and a painful arc from 90 – 115 degrees of abduction. He had pain on resisted external rotation testing and was weak with internal rotation testing. Lachlan had positive impingement tests and pain on palpation over the supraspinatus tendon insertion. Lachlan also had a significant loss of passive internal rotation at his glenohumeral joint.

Lachlan was diagnosed with a right supraspinatus tendonopathy secondary to subacromial impingement. This was the consequence of poor work ergonomics, sedentary postures, muscle imbalance and a recent history of a repeated lifting task.

Treatment consisted of postural correction in the car and at work. Cues such as a lumbar roll and scapula taping provided Lachlan with biofeedback as to correct postures when performing daily tasks. Lachlan started a 12 week rotator cuff strengthening and scapula stability programme, which was supervised by a physiotherapist, initially twice per week, and reducing to once per week as his symptoms settled. Manual therapy techniques consisted of trigger point release, soft tissue frictions to desensitise the supraspinatus tendon, and joint mobilisation techniques.

Lachlan was able to return to swimming after 8 weeks of performing his rehabilitation programme. He completed his first water polo match pain free at 10 weeks post intervention. At 12 weeks he reported 90% resolution of his symptoms, including moderate to heavy lifting loads. Most importantly, Lachlan now had strategies in place at work and home, as well as improved strength and stability, to prevent the otherwise likely reoccurrence of this injury.