



Decompression surgery under pressure

Keywords:

Subacromial impingement
Subacromial decompression
CSAW
FIMPACT

1. Introduction

Painful shoulders pose a substantial economic burden¹ accounting for 2–4% of primary care consultations in the UK² and 4.5 million visits to physicians annually in the USA.³

Neer⁴ described the subacromial impingement syndrome as a potential cause of subacromial pain. The mechanism proposed involved mechanical contact between the rotator cuff tendons and the extrinsic overlying acromion or bone spur that often forms at the anteroinferior margin of the acromion, narrowing the subacromial space.

Whilst subacromial pain accounts for up to 70% of all shoulder pain problems⁵ it is important to realise that such pain may be caused by a spectrum of shoulder pathology including subacromial impingement but also rotator cuff tears and calcific tendinitis. In addition, subacromial impingement is commonly associated with other pathologies including biceps tendonitis and acromioclavicular joint arthritis.

1.1. This editorial focusses on isolated subacromial impingement

There have been a number of studies published which advocate the use of physiotherapy in the treatment of subacromial impingement. A study by Hallgren et al.⁶ published in 2014 in the British Journal of Sports Medicine showed an improvement in patients treated by a three month exercise specific programme. Only 20% of patients treated by exercise went on to surgery compared to 63% in the control group. Similarly, in 2013 Ketola et al.⁷ published a randomised control trial comparing an exercise programme to subacromial decompression (in conjunction with the exercise programme). In their study of 109 patients, at 5-year follow up, no significant difference could be found between the two groups.

In contrast, other studies have indicated an improved outcome following subacromial decompression surgery over therapy. In 2018, Farfaras et al.⁸ published a prospective randomised trial with a ten year follow up period which showed significantly better outcomes in patients treated by open and arthroscopic subacromial

decompression over physiotherapy alone.

Whilst there is no doubt that many patients with isolated subacromial impingement will respond to non operative treatment alone,⁹ surgical intervention is often used in the treatment of recalcitrant cases.

In 2015, the British Elbow and Shoulder Society published a patient care pathway for the management of subacromial shoulder pain.¹⁰ This care pathway formed the basis of the commissioning guidelines which were NICE approved.¹¹

The commissioning guidelines for the management of rotator cuff tendinopathy/subacromial impingement suggest the following measures should be considered in the initial treatment of this condition:

- Education, rest, NSAIDs, simple analgesia
- Appropriate structured physiotherapy with goal setting for 6 weeks to include postural correction and motor control retraining, stretching, strengthening of the rotator cuff and scapula muscles and manual therapy
- Do not consider further physiotherapy unless there is improvement during the first 6 weeks of treatment
- Injection of corticosteroid into the subacromial space. Normally, only one injection should be considered as repeated injections may cause tendon damage
- A second injection is occasionally appropriate after 6 weeks, but should only be administered in patients who received good initial benefit from their first injection and who need further pain relief to facilitate their structured physiotherapy treatment

The guidelines further recommend arthroscopic shoulder decompression (acromioplasty) should be considered for patients with:

- Impingement pain in the absence of a rotator cuff tear
- Impingement pain with an irreparable rotator cuff tear
- Impingement pain with a cuff tear that the patient chooses not to have repaired
- Failure of appropriate conservative management

The guidelines advise that a shared decision making model should be adopted, defining treatment goals and taking into account personal circumstances.

Historically it has been considered that the mechanism by which decompression surgery is effective is by increasing the subacromial space, hence preventing extrinsic impingement of the rotator cuff tendons by the overlying acromion process.⁴ This is done by excising the anterior bony acromial spur, flattening the under-surface of the acromion and excising the overlying bursal tissue

(bursectomy). However it should be noted that this mechanism has been brought in to question in the light of recent research.

In 2009, a RCT performed by Henkus et al.¹² compared subacromial decompression (acromial resection) plus bursectomy with bursectomy alone and reported no significant difference in clinical outcome between the groups.

Recently, the Can Shoulder Arthroscopy Work (CSAW) study¹³ was published in the Lancet. This trial focused specifically on subacromial decompression in isolation and aimed to investigate whether the proposed critical surgical element, removal of bone and soft tissue, is necessary.

All of the patients in the study were suffering from subacromial impingement pain and had had symptoms for a minimum duration of three months. All patients had an intact rotator cuff or partial thickness tendon tear and had failed to respond to physiotherapy treatment and at least one cortisone injection.

The trial randomised patients to three treatment options:

- i. Arthroscopic surgery with surgical decompression
- ii. Arthroscopy without surgical decompression (placebo surgery)
- iii. No surgery and observation only.

The results of the trial were as follows:

- i. There was no difference between arthroscopic subacromial decompression and arthroscopy only (placebo surgery)
- ii. Patients improved without further treatment and with observation only
- iii. Surgery (both decompression and placebo) conveyed a small, statistically significant improvement compared to observation only but this was not considered to be clinically relevant.
- iv. The trial concluded that the difference between the surgical routes and no treatment might be the result of a placebo effect or postoperative physiotherapy

When published, the trial raised significant media interest and unsurprisingly, the economic benefit of subacromial decompression surgery was immediately brought into question.

In response to the study, a joint statement was issued by the British Elbow and Shoulder Society, British Orthopaedic Association and the CSAW study group.¹⁴ The statement noted that the trial had shown the mechanism by which subacromial decompression surgery provided improvement was uncertain and had demonstrated that some patients can improve without surgery. Furthermore, it highlighted the importance of involving patients in a decision making process and of applying appropriate commissioning guidelines.

There is published evidence that treating patients according to national guidelines is associated with improved outcomes. In 2017 Jacobsen et al.¹⁵ evaluated arthroscopic subacromial decompression in 244 patients selected according to national guidelines. The guidelines stated that pain must have been present for longer than 6 months and a physiotherapy programme (non-specific) must have been undertaken for a minimum of 3 months before decompression surgery was considered. Patients treated on this basis demonstrated significant clinical improvements following decompression at 6 month follow up. The authors concluded that arthroscopic subacromial decompression was a valid treatment, reducing pain and improving quality of life for patients selected for surgery according to the Danish national guidelines.

Shortly after publication of the CSAW study, a similar study was published, in the BMJ - the Finnish Shoulder Impingement Arthroscopy Control Trial (FIMPACT).¹⁶ The aim of this study was to assess the efficacy of arthroscopic subacromial decompression, comparing it with a placebo surgical intervention (diagnostic arthroscopy) and

with a non-operative alternative, exercise therapy, in a more pragmatic setting. It was a multicentre three group randomised double-blind, sham control trial. There were 210 participants with symptoms consistent with shoulder impingement syndrome for more than 3 months that had failed to improve with conventional conservative treatment.

In the primary intention to treat analysis (arthroscopic subacromial decompression versus diagnostic arthroscopy) no clinically relevant between-group differences were seen in the Visual Analogue Scale (VAS) scores at arm rest or on arm activity at 24 months. In the secondary comparison (arthroscopic subacromial decompression versus exercise therapy), statistically significant differences were found in favour of arthroscopic subacromial decompression in both VAS at rest and on arm activity at 24 months but the mean differences between groups did not exceed the prespecified minimal clinically important difference (MCID).

The FIMPACT authors argue that diagnostic arthroscopy can be perceived as a placebo intervention as tidal irrigation and arthroscopic lavage have both failed to provide a benefit over placebo procedures in knee osteoarthritis.^{17,18} One could argue that this might not be the case. If there has been an overestimation of the effects of the anterior bony spur in isolated subacromial impingement, patients may be comparatively more symptomatic from subacromial bursitis (or bursal degeneration) than previously thought.¹² It is known that corticosteroid injections have a local anti-inflammatory effect on the bursa and are a recognised treatment modality for subacromial impingement and therefore one could postulate that arthroscopic bursoscopy may dilute the effect of local inflammatory mediators associated with subacromial bursal degeneration leading to a reduction in pain.

Nonetheless, the results of the CSAW and FIMPACT trials clearly question the role by which subacromial decompression surgery is effective and raise the possibility that there is a significant placebo effect.

Whilst it is easy for surgeons to ignore the results of these important studies, good professional practice dictates that we must accept the results of these well designed trials and question our own clinical practice.

The British Elbow and Shoulder Society is working with the Royal College of Surgeons, the British Orthopaedic Association and NICE to producing revised commissioning guidelines for decompression surgery.

In addition, further clinical research is required to help surgeons define the criteria by which patients who would benefit from decompression surgery can be identified.

Finally, it is important to reiterate that the results from the CSAW and FIMPACT studies focus on isolated subacromial impingement and do not consider other possible co-existing shoulder pathologies for which subacromial decompression is performed concurrently.

Conflict of interest declaration

None.

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