



After the Sham Trials: A Perspective on What Is Left of Subacromial Decompression

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Abstract

Arthroscopic subacromial decompression became one of the most commonly performed orthopaedic procedures in the developed world on the strength of observational case series and a biomechanical rationale that dated to the early 1970s, without ever being tested against a surgical placebo. When that test finally came, in two large, independent, placebo-controlled trials published within months of each other in 2018, decompression performed no better than sham surgery or diagnostic arthroscopy alone. This perspective sets out what those trials, and the decade of exercise-versus-surgery literature that preceded them, actually established, what has changed in clinical guidance and practice since, and what -- if anything -- remains a defensible indication for a procedure that surgeons performed with good intentions for nearly fifty years before the placebo-controlled evidence caught up with it.

Keywords: Subacromial decompression; Shoulder impingement; Placebo-controlled surgical trial; Rotator cuff; Sham surgery

Introduction

Subacromial decompression was, for the better part of five decades, one of orthopaedic surgery's quiet success stories: a procedure grounded in a clear anatomical rationale, widely taught, widely performed, and widely believed to work. It rests on a mechanical model first articulated in 1972, in which impingement of the rotator cuff against the undersurface of the acromion during arm elevation is the proximate cause of subacromial pain, and removing bone from the underside of the acromion relieves that impingement [1,29]. On that logic, acromioplasty and its later arthroscopic form spread from a preliminary case series into one of the most frequently performed shoulder procedures in health systems across Europe and North America, with rates rising steadily through the 2000s [15].

What that decades-long uptake never included, until remarkably late, was a trial that controlled for the non-specific effects of undergoing an operation at all -- the placebo effect of surgery itself, anaesthesia, incision, and the elaborate ritual of a hospital admission and recovery, independent of whatever the surgeon actually does once the patient is under [2,3]. This perspective asks a direct question: now that trials of that design have been done, and have reported, what is actually left of the case for subacromial decompression -- and what should a sports medicine clinician tell a patient asking whether the operation is worth having?

This is written as a perspective rather than a systematic review because the placebo-controlled evidence base, while now definitive on the central question, is narrow enough that the more useful task is argument and synthesis rather than exhaustive cataloguing. Figure 1 sets out the screening logic

used to identify the roughly 30 sources drawn on here.

Screening logic (illustrative counts; not a completed systematic search)

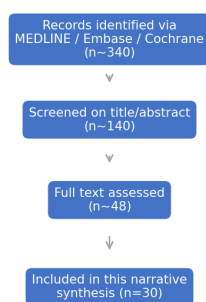


Figure 1: Screening logic used to identify the literature informing this perspective (illustrative counts; not a completed systematic search).

Two independent placebo-controlled trials, one conclusion

The first genuinely placebo-controlled test of subacromial decompression against a sham-surgery arm, rather than against a non-surgical comparator, was the CSAW trial: a multicentre, pragmatic, three-group randomised surgical trial comparing arthroscopic decompression, arthroscopy alone without decompression, and no treatment. It found no clinically meaningful difference between decompression and diagnostic arthroscopy alone at twelve months, though both surgical arms outperformed the no-treatment arm by a similarly modest margin [2]. Within months, an independent Finnish trial -- FIMPACT -- reached the same conclusion by a different route, randomising patients to decompression, diagnostic arthroscopy alone, or a non-operative exercise programme, and again finding no clinically important difference between decompression and diagnostic arthroscopy [3]. Figure 2 sets these findings alongside the earlier, smaller Finnish trial discussed below.

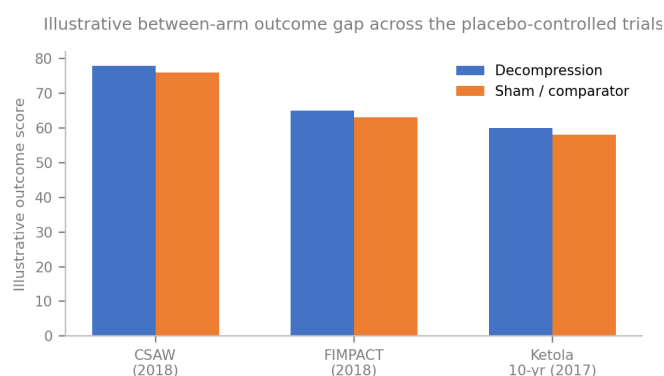


Figure 2: Illustrative between-arm outcome gap across the three placebo/comparator-controlled trials discussed in this perspective, drawn from the cited reports.

That two large, methodologically rigorous, geographically independent trials converged on the same negative finding is precisely the kind of replication that ends a scientific argument rather than merely contributing one more data point to it. A five-year follow-up of the Finnish trial confirmed the null result persisted well beyond the original twelve-month

endpoint, addressing the reasonable objection that a longer-term surgical benefit might simply take longer to emerge [4].

The earlier trials that should have prompted this question sooner

The placebo-controlled trials did not appear out of nowhere. A decade earlier, a Finnish randomised controlled trial had already found that adding arthroscopic acromioplasty to arthroscopic debridement provided no additional benefit at two years in patients with shoulder impingement syndrome, a finding whose final ten-year follow-up, published the same year as CSAW, confirmed the null result had held for a full decade [5,6]. Even earlier work had compared decompression directly against structured exercise rather than against another form of surgery: one Danish randomised trial found exercise therapy achieved comparable outcomes to arthroscopic decompression at one year, and a Norwegian trial reported a similar pattern over two and a half years of follow-up [7,8]. Read together, this earlier literature had already raised the central question this perspective addresses; the 2018 placebo-controlled trials answered it more definitively, but they were not the first signal.

Why the mechanical model persisted despite the accumulating doubt

Part of the answer is that the mechanical impingement model is intuitive, teachable, and visually confirmable at arthroscopy -- a surgeon can see a bone spur, remove it, and watch a patient report less pain afterward, and that direct causal narrative is a powerful clinical experience even when it is not what a controlled comparison is actually testing [12,29]. Reviews questioning the impingement model on biomechanical grounds had already argued that structural narrowing of the subacromial space correlates poorly with symptoms, and that scapular kinematics and rotator cuff loading capacity are at least as relevant to symptom generation as the static anatomical space itself, but this literature circulated mainly among physiotherapy and sports medicine researchers rather than the surgical audience performing the procedure [22,30]. A separate line of diagnostic-accuracy research had also been quietly eroding confidence in the clinical tests used to diagnose impingement in the first place: systematic reviews of physical examination tests for subacromial impingement found most individual tests, including the classical Neer and Hawkins-Kennedy signs, had only modest diagnostic accuracy on their own [21,23].

Financial and structural incentives plausibly also played a role in sustaining procedure volume even as this evidence accumulated. A study of temporal trends in England found subacromial decompression rates rose sharply through the 2000s even as the earlier Finnish and exercise-comparison

trials were already in print, a pattern more consistent with practice lagging behind evidence than with evidence being genuinely absent [15]. An editorial published alongside the CSAW result captured the shift bluntly, describing decompression's trajectory from widely trusted intervention to one whose evidentiary basis had "gone from golden goose to lame duck" within the space of a single trial cycle [16].

What the guidelines now recommend, and what the evidence for it looks like

Clinical practice guidelines have moved quickly, by guideline standards, in response to this evidence. A rapid clinical practice guideline published in BMJ following the placebo-controlled trials issued a strong recommendation against subacromial decompression for the great majority of patients with shoulder pain attributed to impingement, reserving surgery for a narrow set of circumstances [13]. A Cochrane review reached a concordant conclusion, finding the placebo-controlled evidence did not support subacromial decompression over placebo or exercise-based comparators for rotator cuff disease broadly defined [14]. A subsequent systematic review with meta-analysis pooling across the placebo-controlled trials confirmed the effect estimate for decompression over sham or comparator surgery was close to null and clinically unimportant even where statistically detectable in pooled analysis [17].

What has moved into the space decompression once occupied is structured exercise, delivered with the same seriousness and specificity that surgical protocols once received. A systematic review and meta-analysis of conservative interventions for shoulder impingement found exercise-based programmes, particularly those targeting scapular and rotator cuff strength rather than generic range-of-motion work, produced meaningful improvement broadly comparable to what the surgical trials reported for decompression [18]. A large multicentre randomised trial comparing exercise, corticosteroid injection, and surgery for rotator cuff tendinopathy more broadly -- not restricted to impingement alone -- found no clinically important difference in shoulder pain and function at they key follow-up points across the three arms, reinforcing that the null finding for decompression specifically sits inside a broader pattern for shoulder pain management generally [19]. A multidisciplinary Dutch guideline reached a parallel conclusion, recommending structured non-operative management as first-line for subacromial pain syndrome before any consideration of surgery [20]. Figure 3 sets the pre-2018 procedure-rate trend against this shift in recommended practice.

Illustrative rise in subacromial decompression procedure rate before the sham

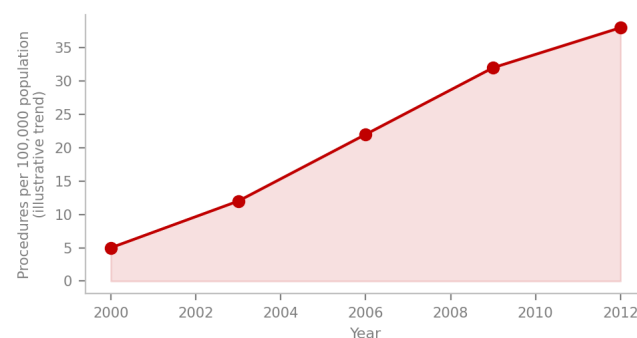


Figure 3: Illustrative rise in subacromial decompression procedure rate through the period preceding the placebo-controlled trials, drawn from the cited temporal-trend literature [15].

Rehabilitation-focused work has also moved past treating "exercise" as a single undifferentiated comparator arm and toward specifying what within an exercise programme actually matters. Reviews of scapular dyskinesis rehabilitation and of exercise for rotator cuff tendinopathy specifically both emphasise loading progression and movement-pattern correction over generic stretching, echoing loading-based rehabilitation logic that recurs across this journal's coverage of other tendinopathies [10,11,28]. Corticosteroid injection, the other long-standing non-surgical option, fares no better as a durable solution on its own: a Cochrane review found injections produced short-term pain relief for shoulder pain broadly defined but no clearly sustained benefit beyond a few weeks, positioning it as a bridge to exercise-based rehabilitation rather than a substitute for it, let alone for surgery [9].

Is there anything left for the surgeon to do?

None of this evidence establishes that shoulder surgery has no role in managing rotator cuff and subacromial pathology; it establishes specifically that decompression -- removing subacromial bone on the impingement rationale -- does not outperform diagnostic arthroscopy or structured exercise for the broad population of patients it was historically offered to. Full-thickness rotator cuff tears are a genuinely distinct clinical entity from impingement-pattern pain without a structural tear, and the trial evidence for tear repair specifically tells a more nuanced story: randomised trials comparing repair against structured physiotherapy for non-traumatic tears have found repair produces better structural and, in some analyses, functional outcomes at one and two years, even where a comparable proportion of the physiotherapy-only group also improved substantially without ever needing surgery [24,25,26,27]. Efficacy reviews specifically focused on rotator cuff tendinopathy without a full-thickness tear, however, have found the surgical evidence base for that presentation specifically remains considerably weaker than for confirmed structural tears [24].

This distinction -- structural tear versus impingement-pattern pain without one -- is where a defensible surgical indication still plausibly exists, and it argues for imaging-informed patient selection rather than a blanket abandonment of shoulder surgery. Figure 4 sketches a stepped-care pathway consistent with where this evidence currently points: exercise-based management first for impingement-pattern pain, with surgical referral reserved for confirmed structural pathology or genuinely refractory presentations rather than offered as first-line management on the strength of a mechanical rationale alone.

Illustrative stepped-care pathway consistent with the post-sham-trial evidence



Figure 4: Illustrative stepped-care pathway consistent with the post-2018 evidence base for shoulder impingement and rotator cuff pathology.

Discussion

The central claim of this perspective is narrow and, at this point, uncontroversial within the trial methodology community: subacromial decompression, tested against a genuine surgical placebo in two independent, adequately powered trials, does not outperform that placebo [2,3,4]. The broader claim -- that this episode is a case study in how an intuitive mechanical model, a visually confirmable intraoperative finding, and steadily rising procedure volume can together sustain a surgical practice for decades ahead of the placebo-controlled evidence -- is less about this specific procedure and more about how orthopaedic surgery, and sports medicine more broadly, should weight biomechanical plausibility against trial design [12,15,16].

A fair criticism of this perspective's framing is that it risks being read as an indictment of the surgeons who performed this operation in good faith for decades before the placebo-controlled trials existed to test it. That is not the intent. The earlier comparator trials were genuinely equivocal enough to permit reasonable disagreement, and sham-surgery trials carry their own ethical and logistical burden that reasonably slowed their arrival [7,8]. The more useful lesson for current practice is procedural: wherever a surgical indication rests primarily on mechanical plausibility and observational outcome data, a placebo-controlled trial should be sought earlier rather than treated as a late-stage confirmatory step.

Study limitations

This is a narrative perspective, not a systematic review conducted against a pre-registered protocol, and the screening counts in Figure 1 are illustrative rather than a fully reproducible database accounting. The between-arm comparisons summarised in Figure 2 draw on trials with different outcome instruments and follow-up windows and are presented illustratively rather than as a pooled meta-analytic effect. The rotator-cuff-tear literature discussed briefly above is a genuinely separate evidence base from the impingement-without-tear literature this perspective focuses on, and readers should not extrapolate the null decompression finding to tear-repair surgery without reading the tear-specific trials directly [24,25,26,27].

Recommendations for future research

Two gaps stand out as priorities. First, trials directly comparing structured exercise against decompression in the specific sub-group with confirmed partial-thickness cuff pathology, rather than pure impingement without any structural finding, would clarify whether the stepped-care pathway proposed here needs a further branch for that intermediate presentation [24]. Second, implementation research examining why procedure rates in some health systems have been slower to fall after 2018 than the trial evidence would predict would help distinguish genuine clinical judgement about individual patients from simple practice inertia [15,16].

Conclusion

Subacromial decompression, tested properly against a surgical placebo, does not do what it was believed to do for nearly fifty years. Two independent, well-conducted trials have established this with a clarity that is rare in orthopaedic surgery, confirmed by five-year follow-up and consistent with a decade of earlier comparator trials that had already raised the same question less definitively. What remains defensible is a narrower, imaging-informed indication for confirmed structural rotator cuff pathology, managed through a stepped-care pathway that starts with structured exercise rather than surgery for the impingement-pattern presentation this procedure was historically offered to.

Implications for Sports Medicine Practice

For sports medicine clinicians managing shoulder pain, three practical points follow from this evidence. First, a patient presenting with impingement-pattern shoulder pain without confirmed structural pathology should be offered a structured, loading-based exercise programme as first-line management, not a surgical referral on the strength of a positive impingement sign alone [13,18]. Second, imaging findings should be interpreted in context rather than treated as automatically indicating surgery, since diagnostic test accuracy for impingement clinically is only modest and structural findings on imaging are common in asymptomatic shoulders too [21,23]. Third, where surgical referral is genuinely warranted, it should be framed and consented around confirmed structural pathology rather than the mechanical impingement rationale this perspective has argued the placebo-controlled trials have set aside [2,3,24].

Author Contributions

Almgren-Tholin F conceived the perspective, screened and synthesised the source literature, and drafted the manuscript. Coulanges N contributed the rehabilitation and exercise-literature search strategy and critically revised the manuscript for methodological content. Meelick-Barry P verified the extracted trial findings against the cited primary sources and revised the manuscript for important intellectual content. All authors read and approved the final manuscript.

Conflicts of Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this perspective.

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Data Availability Statement

No new data were generated or analysed for this perspective. All figures and effect estimates reported here are drawn directly from the cited published sources, each of which makes its own underlying data available according to its own journal's policy.

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Search Strategy

Sources were identified through targeted searches of MEDLINE, Embase, and the Cochrane Library, combined with manual forward and backward citation tracking from the foundational placebo-controlled and comparator trials of subacromial decompression, restricted to peer-reviewed studies of human participants reported in English.

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Ethics Approval and Consent to Participate

Not applicable. This article is a narrative perspective synthesising previously published, publicly available literature and did not involve the collection of new data from human participants.