



Should arthroscopic lavage and debridement be performed for osteoarthritis of the knee?

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INTRODUCTION

Osteoarthritis (OA) is the most common cause of joint pain, causing significant functional limitations worldwide¹. It is a degenerative disease of synovial joints characterised by articular surface damage and secondary inflammation. There is no cure for OA, and conservative measures such as exercise and medication are recommended before surgical intervention². Pain relief is the main objective of treatment.

One of the surgical options for mild to moderate OA of the knee is arthroscopy, where an endoscope is placed inside the knee joint under general anaesthetic. The procedure can be both diagnostic, offering detailed imaging of joint damage, and therapeutic, where the joint may undergo lavage or debridement. During lavage, irrigation fluid is washed through the joint to clear out debris that may promote inflammation. During debridement, loose bodies or osteophytes may be removed, preventing any obstacles to joint movement³. Under the category of debridement, arthroscopic partial meniscectomy (APM) can be performed of the knee, where pieces of torn meniscus are removed. Meniscal lesions may be one of the first signs of the OA disease process, and are a common finding in OA of the knee⁴.

A large randomised controlled trial (RCT) in 2002 found that arthroscopic lavage or debridement provided no more pain relief than sham surgery for OA of the knee³. Several other RCTs have reported little benefit of arthroscopy over conservative treatments^{5,6}. In spite of this, clinicians seem reluctant to stop arthroscopies. They are still being routinely performed, particularly for torn menisci. I met a patient who was described as an arthroscopy addict, waiting to have his third arthroscopy of the year for OA of his knee. In this essay, I wish to discuss whether these operations should continue considering the plethora of evidence against them.

EARLY EVIDENCE FOR ARTHROSCOPY

The use of arthroscopy in OA of the knee was initially supported by a host of early studies. Sprague (1981) found that 84% of patients who underwent arthroscopic debridement for OA of the knee had a positive outcome defined by a subjective score of pain⁷. Similarly, Richards and Lonergan (1984) found that 81% of patients had improvement in pain following arthroscopic debridement for OA of the knee⁸.

However, many of these early studies were uncontrolled and retrospective, allowing for recall bias.

The first RCT, which used placebo as a control against arthroscopy, showed mixed efficacy of lavage⁶. Patients received either 3000ml or 250ml (the minimum amount required for an arthroscopy) of irrigation fluid for washout. There was no statistically significant improvement of the primary outcome – an aggregate score of stiffness, disability and pain. However, there were statistically significant improvements in pain alone ($p=0.02$) (see Figure 1).

This, combined with earlier studies, may suggest that arthroscopy is a useful therapeutic approach to deal with osteoarthritic pain of the knee. However, the control of this study is questionable.

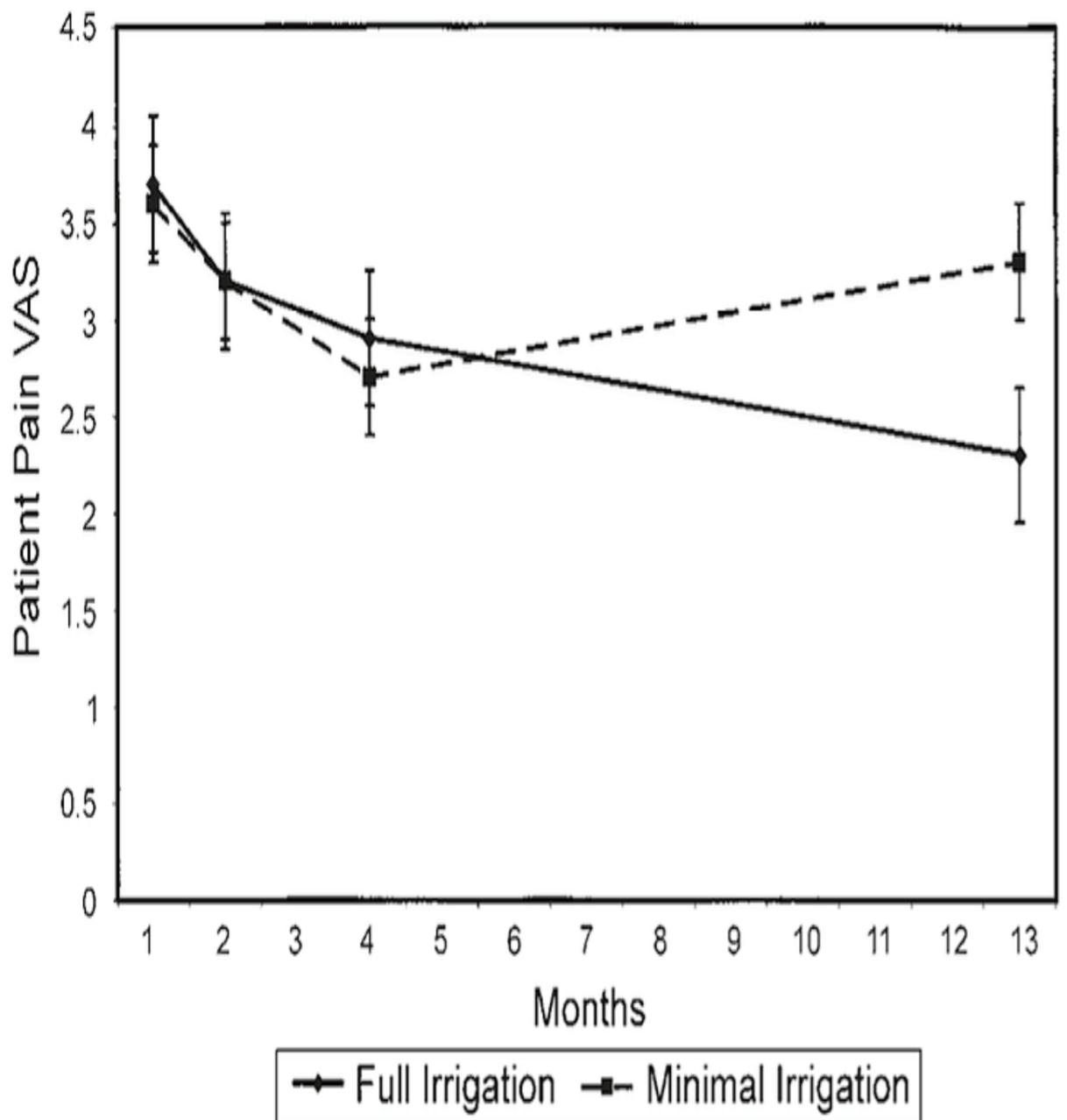


Figure 1:
Changes in self-reported pain by the visual analogue scale (VAS) following arthroscopic lavage with 3000ml (full irrigation – full line) or 250ml (minimal irrigation – dotted line) irrigation fluid. Extracted from Kalunian et al. (2000).

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The authors describe their minimal irrigation fluid group as a placebo group, yet the patients still underwent a procedure where an endoscope was inserted and fluid passed through their joint. Therefore it does not act as a true placebo. Furthermore it remains unclear why the improvement in pain took more than half a year to present.

To settle this contention, a much larger RCT was conducted in 2002³. Patients were randomised to receive either debridement, lavage or sham surgery where an endoscope was not inserted and the joint was not washed out. The primary outcome – self-reported pain – improved no more than placebo over the course of two years (see Figure 2). This provided the best evidence that arthroscopy has no real benefit and shouldn't be offered for OA of the knee.

Following these results, the American

Academy of Orthopedic Surgeons (AAOS) decided that arthroscopic lavage and debridement should not be indicated for knee OA⁹.

Accordingly, a decrease in arthroscopy rates for OA of the knee in the NHS has been reported, with an 80% decline in lavage in particular¹⁰.

MENISCAL TEARS AND OSTEOARTHRITIS

Whilst the number of arthroscopic lavage and debridement procedures has fallen, the number of APMs performed in the NHS has increased by 230%¹⁰. Meniscal tear may present on its own or in the context of OA. However, since more than three quarters of patients with knee OA have meniscal tears⁴, arthroscopy is still being performed for OA of the knee, just under a new guise. This is counterintuitive

since previous RCTs found that APM, under the category of debridement, was of limited use.

Nonetheless, clinicians appear to be unmoved by this evidence. They may feel that the physiological explanation – that meniscal tears are an irritable mechanical block in the joint – is still too convincing¹¹. Numerous RCTs have been conducted to investigate the benefit of specifically APM over conservative treatments in osteoarthritic knees, with mixed results. In the first large RCT, patients were given an exercise regime or both APM and an exercise regime. Patients in the APM group had a slightly greater improvement in pain and function¹². Whilst the difference was not statistically significant, it has been argued that it is still clinically meaningful¹³. Another large RCT later compared APM against physiotherapy with APM⁵. Similarly, they found minor improvement in pain in the first six

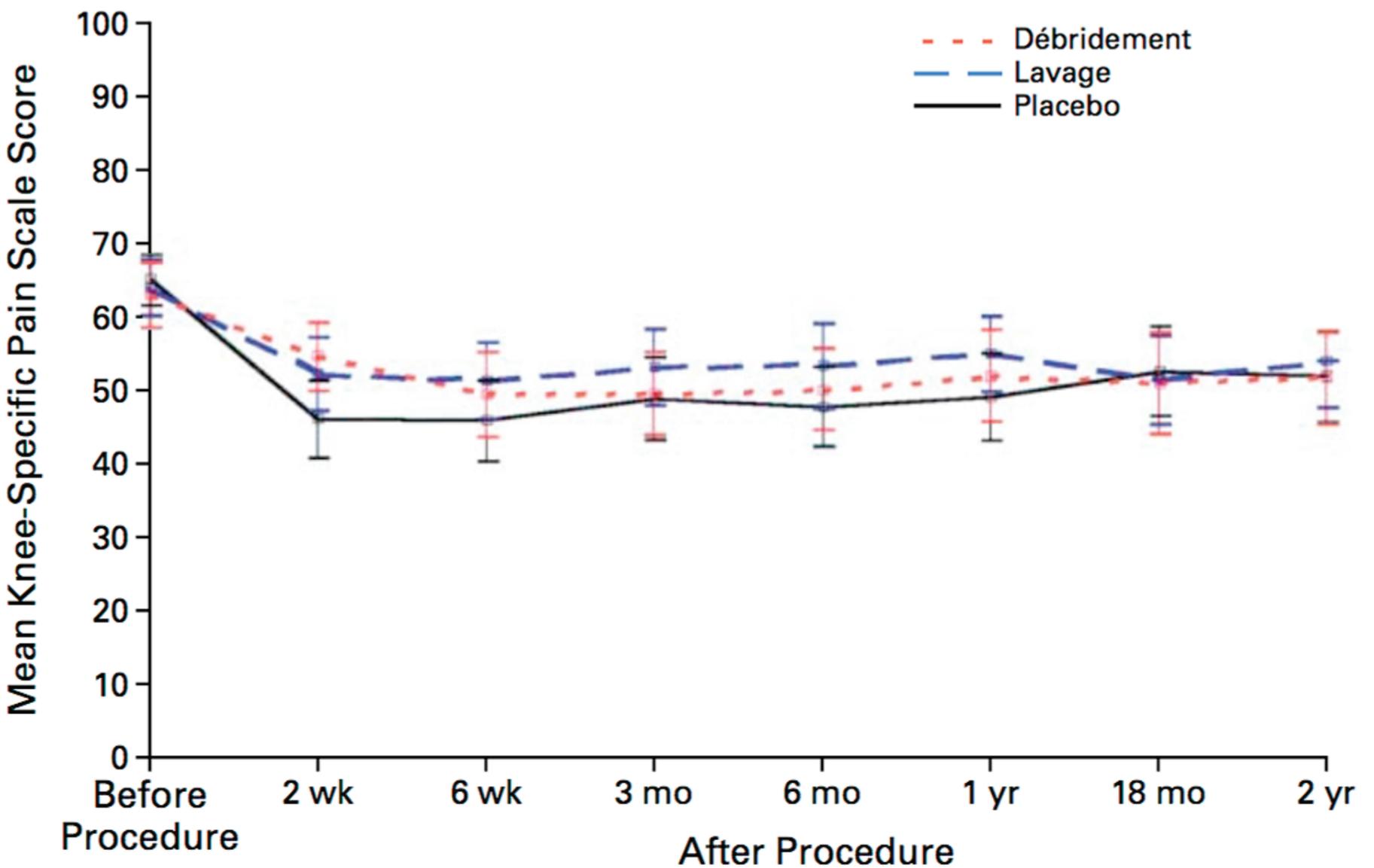


Figure 2:
Knee pain following arthroscopic debridement, lavage or placebo in OA patients monitored over two years.
Extracted from Mosely et al (2002)³



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months in the APM group, although the difference in pain at six or twelve months was also not statistically significant. This suggests that there is little additional benefit in performing APM for OA of the knee. Unfortunately, in this study, 74% of patients were excluded from being eligible for the trial. This massively undermines the generalizability of the results. Whilst many patients were not eligible because they had undergone a previous APM – since the procedure is so common – many also declined to take part because they had a strong preference for APM over physiotherapy. This causes selection bias, since treatment preference may dictate outcome.

Treatment preference creates a big issue within several RCTs investigating APM. Khan et al. (2014) argue that most of these RCTs have a high risk of suffering from poor blinding¹⁴. If patients would prefer to have APM and discover they've had the procedure during a trial, they may be more likely to report greater subjective improvements in pain. This may explain the minor, statistically insignificant, pain relief observed. These mild pain benefits – perceived or otherwise – may be the reason why clinicians struggle to break

the habit of performing arthroscopies for OA of the knee.

Since APM has been shown to have insignificant benefit over conservative measures, a later study considered how arthroscopy may be useful in cases where conservative measures fail. Sihvonen et al. (2013) only enrolled patients who were unresponsive to conservative approaches including physiotherapy and exercise. Unfortunately, they found that APM provided no improvement in pain or function over sham surgery (see Figure 3)¹⁶. However, this study excluded a large proportion of participants because of the location of their meniscal tear, weakening its generalisability. Current treatment guidelines in the NHS do not exclude patients from arthroscopy based on the location of a meniscal tear¹⁷. In addition, arthroscopy is indicated for mild to moderate OA, which usually does respond to conservative approaches like physiotherapy.

Although the authors of this study conclude that APM is of “no value” for degenerative tears, since the outcomes of surgery are no better than placebo, the APM group still showed marked improvement in outcome. Accordingly, one could

argue that it might have some clinical value, and that we should offer it. Even if the benefits of APM are only attributable to the placebo effect, more research should be done investigating the value of sham interventions and how else they might be used therapeutically. In addition, since exercise regimes in other RCTs were not controlled against sham exercises, it is plausible to say that their benefit also arises from a placebo effect. It may seem even more likely that the benefits of APM arise from placebo considering that most patients with OA and no meniscal tear have the same level of pain as patients with OA and a meniscal tear¹⁸. Indeed, it has been shown that 60% of patients from a community sample have a meniscal tear with no symptoms⁴.

Strengthening the argument towards offering arthroscopy for OA of the knee, a recent RCT found that APM actually offered a clinically and statistically significant improvement in pain over twelve months ($p = 0.004$)¹⁵. Patients received exercise or exercise plus surgery. This finding contradicts the conclusions of previous RCTs that arthroscopy has little to no benefit over conservative treatments or placebo.

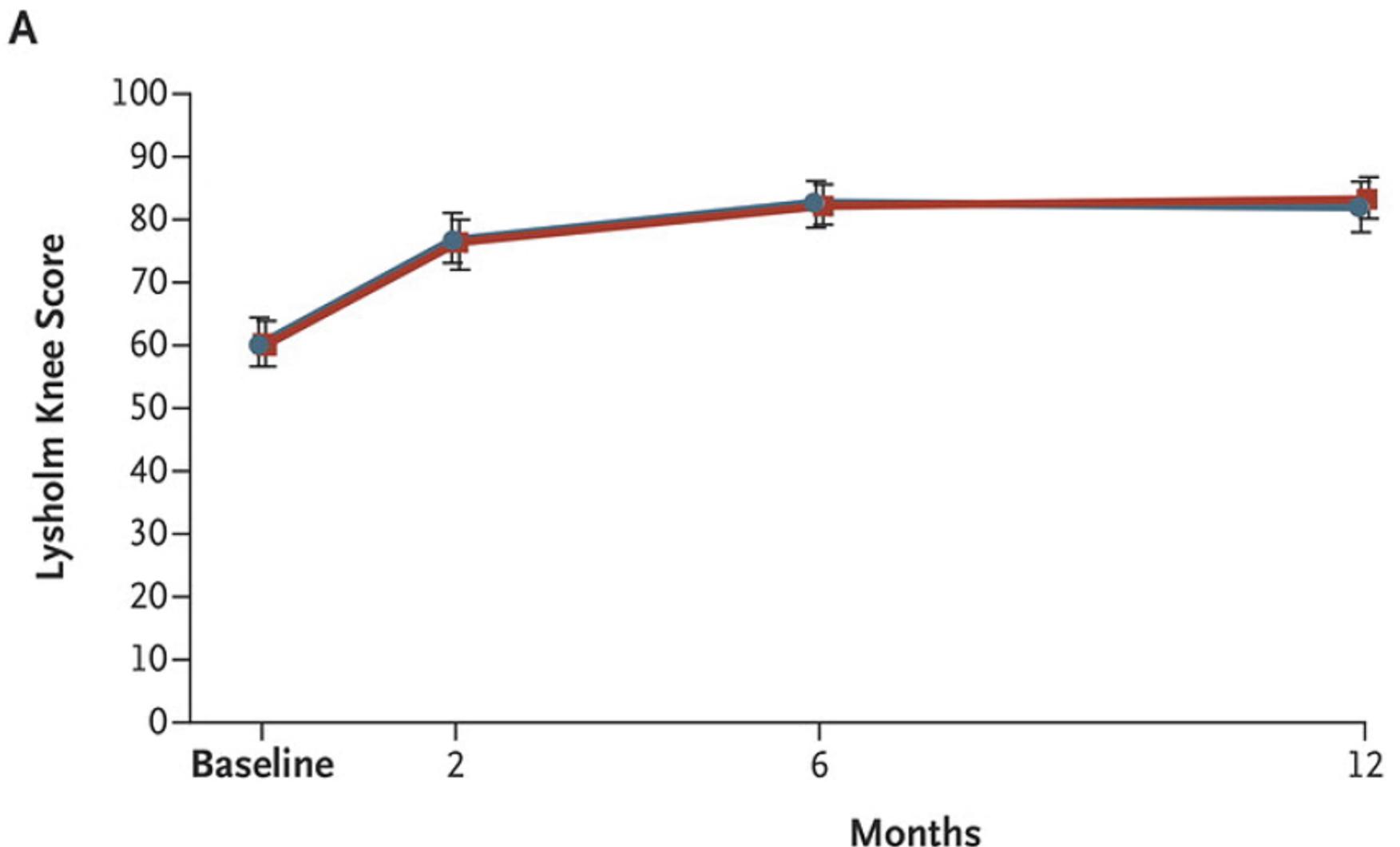


Figure 3
Changes in Lysholm Knee Score pain- a measure of function and pain -over 12 months following APM or sham surgery.
Extracted from Sihvonen et al. (2013)

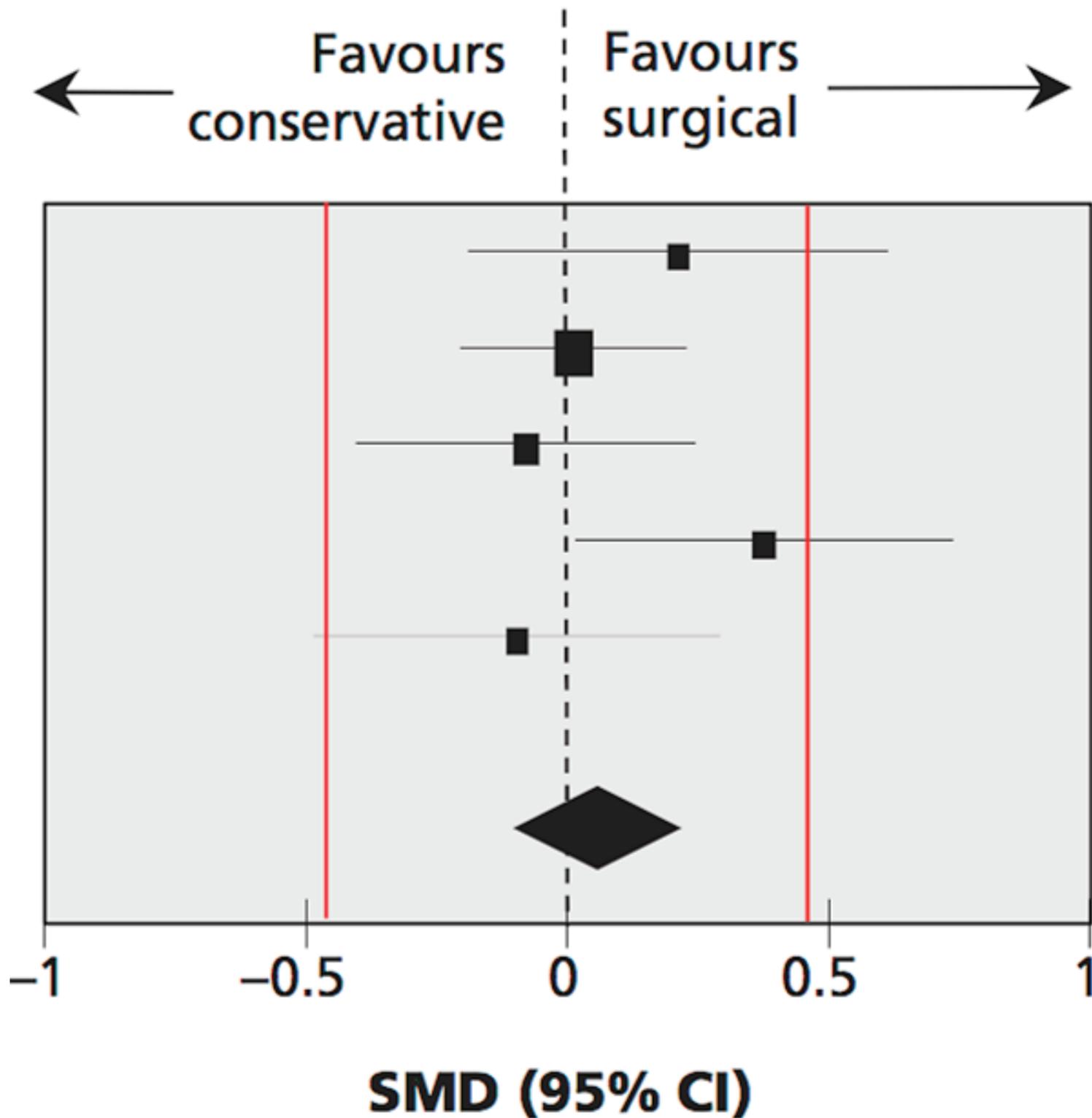


Figure 4

Pooled data on long term function and pain outcomes following APM in OA of the knee. Extracted from Khan et al. (2014).
CI= confidence interval

It is difficult to balance up these contradicting trials to make an appropriate clinical assessment. However, a meta-analysis of the five largest RCTs investigating APM concluded that there is moderate evidence that the procedure has no benefit over conservative treatments or placebo (see Figure 4). In light of this, the AAOS do not recommend APM for OA of the knee¹⁰.

Another factor in the decision to offer APM for OA of the knee is that the procedure may accelerate the development of OA. It has been shown that patients who did not have radiological evidence of OA before APM were significantly more likely to develop radiological changes afterwards¹⁹. Thus, having APM becomes a major risk factor for worsening osteoarthritic

changes. Therefore, a surgeon should ensure that this risk of hastening OA development is outweighed by the benefit of relieving any meniscal rub through APM.

In this context, NICE (National Institute for Health and Care Excellence) guidelines say that arthroscopic lavage and debridement should only be offered where knee OA is associated with clear mechanical locking¹⁷. Mechanical locking is usually caused by a meniscal tear²⁰. Therefore, NICE appear to consider this risk. However, it is argued that making a differential assessment of mechanical locking is difficult²⁰. This may lead to more people having arthroscopy than is recommended. If the meniscus isn't damaged, and the patient doesn't have

mechanical locking, then APM may do more harm than good by accelerating OA development. NICE amended their guidelines in 2014 to separate "mechanical locking" from morning stiffness, radiological evidence of loose bodies or the joint "giving way"¹, but the impact this will have on procedure rates is, as of yet, unclear.

CONCLUSION

It seems surprising that these operations continue since they are shown to have little to no benefit against conservative measures or placebo. Even though the procedure is endorsed by NICE guidelines, which are founded on the basis that the procedure is clinically and cost-effective,



the evidence does not suggest that we should offer arthroscopy in the form of APM or otherwise. It may seem tempting to argue that in such a debilitating, incurable disease as OA any treatment that might help is worth trying. However, it would be safer and cheaper to promote conservative treatments, which have the same efficacy. In addition, performing the operation carries the risk of worsening a patient's OA and contradicts doctors' responsibility to do no harm. Even if arthroscopy causes minimal pain relief by placebo effect, this can be administered much more safely without having to place a patient under general anaesthetic.

Doctors have a duty to practise evidence-based medicine, and by this principle we should not keep offering arthroscopic lavage and debridement for OA of the knee.⁹

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