

Accepted Manuscript

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PII: S1063-4584(19)31145-8

DOI: <https://doi.org/10.1016/j.joca.2019.07.011>

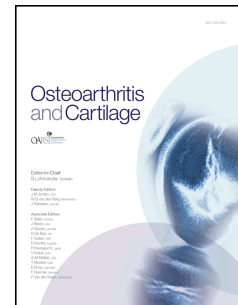
Reference: YJOCA 4512

To appear in: *Osteoarthritis and Cartilage*

Received Date: 6 July 2019

Revised Date: 11 July 2019

Accepted Date: 13 July 2019



Please cite this article as: Lohmander L, Järvinen TL, The importance of Getting it right the first time, *Osteoarthritis and Cartilage*, <https://doi.org/10.1016/j.joca.2019.07.011>.

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OAC10038 revision 1 clean 190710 for Osteoarthritis and Cartilage

Editorial

THE IMPORTANCE OF GETTING IT RIGHT THE FIRST TIME

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Grant Support

TLNJ is supported by unrestricted academic grants from the Sigrid Juselius Foundation, the State funding for university-level health research (Helsinki University Hospital), the Social Insurance Institution of Finland (KELA), and the Academy of Finland. These organizations had no involvement in the writing of the manuscript or its intellectual content.

Role of authors

Both authors wrote the first draft, and edited and approved the final submitted manuscript.

Conflict of interest declaration

LSL provides consulting advice for Arthro Therapeutics AB, GSK, Johnson & Johnson Innovation, Pfizer, Regeneron. TLNJ has no conflict to declare.

In this issue of *Osteoarthritis and Cartilage*, Abram and coworkers report an increase in the proportion of patients undergoing knee arthroplasty (TKR) within 1 or 2 years of arthroscopic partial meniscectomy (APM)¹. The proportion of patients, all in care funded by the National Health Service in England, undergoing TKR within 1 year of APM increased by 141% between 1997 and 2016. The authors noted particularly high rates of TKR conversion for patients over the age of sixty years, with a 1-year rate of APM to TKR conversion of 10% and a 2-year rate of 17%. There was a ten-fold variation in the conversion rate between healthcare regions. The obtained estimates on the incidence of TKR conversion after APM are aligned with the prior evidence, summarized in a systematic review².

So why is it in this context important to get it right the first time, that is, to begin by choosing the right treatment for the right patient at the right time?

There is no clinically relevant benefit of arthroscopic surgery over a structured exercise program or sham surgery in the middle-aged or older patient with knee pain³. More specifically, arthroscopic debridement and lavage provide no benefit over that of sham surgery for patients with knee OA, and APM has been shown not to provide any clinically relevant benefit over sham surgery, or a structured exercise program, for the middle-aged or older patient with knee pain. The high rates of TKR conversion for patients over the age of sixty years is particularly troubling, as we have known for years that arthroscopic surgery for knee pain is least effective in patients with osteoarthritis, and the older one gets, the higher the likelihood that the knee pain is due to having knee OA.

Of further concern, an observational study showed that APM in this patient group was associated with an increased risk for progression of radiographic OA⁴. In this nested case-control study based on the Osteoarthritis Initiative, the authors reported that partial meniscectomy was strongly associated with incident radiographic OA within 1 year, and with an increased risk of worsening cartilage damage, compared to the matched group without meniscectomy. Importantly, these observational study results were confirmed in a follow-up MRI analysis of the MeTeOR randomized trial comparing arthroscopic partial meniscectomy with physical therapy for patients with knee OA and a meniscal tear⁵. Patients undergoing APM had greater advancement of MRI-based OA markers over 18 months than those treated non-operatively.

A widely held contention among frontline practitioners is that within the overall population included in the randomized trials to date, subgroups may exist that could benefit from APM⁶. However, low-risk-of-bias evidence for the existence of subgroups with a more favorable outcome is lacking, while secondary analyses of RCTs speak against the existence of such subgroups^{3,7-9}. These studies found no evidence to support the prevailing ideas that patients with mechanical symptoms, acute onset of symptoms, certain meniscus tear characteristics or those who have failed initial conservative treatment – the subgroups most commonly argued to be optimal candidates – would be more likely to benefit from APM.

How should we interpret the finding that almost 1 out of every 5 patients who undergoes APM ends up having TKR within 2 years of the index surgery? In their publication¹, the authors argue that *“Knee arthroplasty may be considered the undesirable outcome of end-stage symptomatic osteoarthritis and, in the context of APM surgery, may indicate that APM*

was performed in a patient with already advanced osteoarthritis, or that the outcome following APM was characterized by rapidly progressive osteoarthritis". For most medical, non-lifesaving interventions, an almost 20% failure rate within 2 years after the delivery of the intervention would be a cause for serious concern.

What could be the possible explanations for the 10-fold variation in the services provided? Some of this is likely to be attributable to actual between-regions differences in the prevalence of the OA disease *per se* and demographics. However, this would explain only a minor part of the 10-fold variation. A recent study assessing the extent of geographical variation across musculoskeletal surgical procedures and associated factors in Ireland showed that there was minimal variation in hip fracture care while elective hip, knee and spinal procedures – those with the most ambiguous, 'relative' indications – showed highest variation, suggesting that variation in surgeon's beliefs is an important factor¹⁰.

Findings like these might amplify demands to curtail the autonomy of the orthopedic surgeons in defining the indications for their surgeries. Frontline practitioners have recently issued a consensus statement concluding that knee arthroscopy/APM is still a valid procedure if and when patients are chosen correctly¹¹. We would not want to discourage a clearly genuine effort to facilitate the consistent identification and treatment of patients with meniscal lesions, but note that the latest evidence suggests that this effort might turn out to be a tall order. A recent study that set out to identify those most likely to benefit from APM failed to identify any subgroups of patients with certain characteristics having a favorable outcome at 1 year following meniscal surgery, despite combining a large number of preoperative factors presumed clinically relevant¹². By the same token, an electronic

survey carried out on 194 orthopaedic surgeons and residents in the Netherlands and Australia – based on the actual patient cases of the ESCAPE trial¹³ – showed that orthopedic surgeons' predictions of outcome from APM in patients with non-obstructive meniscal tears were no better than prediction expected by chance alone, regardless of level of clinical experience¹⁴. We applaud the arthroscopy consensus statement in concluding that validation [of the introduced concepts] in clinical practice is now required and several areas of uncertainty in relation to treatment should be a priority for future high-quality prospective studies¹¹.

Unsustainable growth in healthcare expenditure demands effective cost-containment policies. Medical overuse has already resulted in healthcare costs outstripping GDP-growth with diminishing returns in population health. Even care that is apparently high quality, safe, efficient, and cost-effective in other circumstances, will decrease in value when delivered to the wrong patient at the wrong time. The outlook becomes grimmer when the efficacy of the intervention is highly questionable. This is the case regarding APM for patients with 'degenerative' knee disease.

Consistent low-risk-of-bias evidence shows that first-line treatment for the middle-aged or older patient with knee pain should be education, a structured exercise program, and where appropriate, referral to a weight-control program^{3,15}. Getting it right first time, this would markedly decrease a perceived need for APM. As a bonus, this may also decrease some of the need for TKR¹⁶.

For all the dark clouds looming over the practice of knee arthroscopy in patients with knee pain and 'degenerative' knee disease, there seems to be some light at the end of the tunnel. Medical reversals are painstakingly difficult¹⁷. However, orthopedic surgeons are to be praised for their exceptional character and self-esteem in accepting the inevitable and for their collective courage in abandoning prior faulty beliefs: During the past few years, we have witnessed a decline in the rates of arthroscopies and meniscectomies in many European countries and even in the US^{3,18}. This makes orthopedic surgeons stand out from most other medical specialist groups.

Striving to get it right first time, Abrams and colleagues conclude by recommending the development and adoption of national treatment guidance for arthroscopic meniscal surgery to improve and standardize treatment selection^{1,19}. Although we highly commend this initiative, we encourage them to aim higher: There appears to be an urgent need to implement processes to reduce inappropriate arthroscopic knee surgery in the UK. A clinician-led evidence-based policy with proven success could be a tempting model to build on²⁰.

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