A Trustworthy and Digital Evidence Ecosystem for increased value and reduced waste in research and health care

Per Olav Vandvik
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Declaration of interests
Evidence-based medicine: Great advances
Meniskoperasjon, kjønns- og aldersjusterte rater pr. 100.000 innbygger pr. boområde, fordelt på offentlig og privat behandler, gj.snitt for perioden 2011-2013

<table>
<thead>
<tr>
<th>Boområde/oppfølgningsområde</th>
<th>Privat behandler</th>
<th>Offentlig sykehus</th>
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<td>Nord-Trøndelag</td>
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</table>

Kilde: NPR/SSB
Director of regional hospital trust: “Almost impossible to know what is the right thing to do”
Finding trustworthy answers to clinical questions

Surgery for degenerative meniscal tears?

AUDIT
Implement

Apply the recommendations on individual patients

FOCUSED QUESTIONS

Search for recommendations in evidence-based guidelines

Can you trust and use those recommendations?
No trustworthy guidelines in Norway

More Results...

Systematic reviews

PLUS Syntheses

Arthroscopic surgery for degenerative tears of the meniscus: a systematic review and meta-analysis. (Systematic Review)

PLUS Studies

Efficacy of magnetic resonance imaging evaluation for meniscal tear in acute anterior cruciate ligament injuries. (Original Study)

Arthroscopic partial meniscectomy versus sham surgery for a degenerative meniscal tear. (Original Study)

Below this bar you must do your own critical appraisal. (and can use these criteria if you wish)

PubMed Clinical Queries

These results are yielded from your search term combined with Search Filters which are a modified version of our PubMed Clinical Queries.

Systematic Reviews

Degenerative meniscus: Pathogenesis, diagnosis, and treatment options.

MR imaging characteristics and clinical symptoms related to displaced meniscal flap tears.

More Results...

Therapy

Arthroscopic surgery for degenerative tears of the meniscus: a systematic review and meta-analysis.

Arthroscopic debridement compared to intra-articular steroids in treating degenerative medial meniscal tears.
Arthroscopic Partial Meniscectomy versus Sham Surgery for a Degenerative Meniscal Tear

Raine Silvonen, M.D., Mika Paavola, M.D., Ph.D., Antti Malinaara, M.D., Ph.D., Ari Itälä, M.D., Ph.D., Antti Joukainen, M.D., Ph.D., Heikki Nurmi, M.D., Juha Kalske, M.D., and Teppo L.N. Jarvinen, M.D., Ph.D., for the Finnish Degenerative Meniscal Lesion Study (FIDELITY) Group

ABSTRACT

BACKGROUND

Arthroscopic partial meniscectomy is one of the most common orthopedic procedures, yet rigorous evidence of its efficacy is lacking.

METHODS

We conducted a multicenter, randomized, double-blind, sham-controlled trial in 246 patients 35 to 65 years of age who had knee symptoms consistent with a degenerative medial meniscus tear and no knee osteoarthritis. Patients were randomly assigned to arthroscopic partial meniscectomy or sham surgery. The primary outcomes were changes in the Lysholm and Western Ontario Meniscal Evaluation Tool (WOMET) scores (each ranging from 0 to 100), with lower scores indicating more severe symptoms and in knee pain after exercise (rated on a scale from 0 to 10, with 0 denoting no pain at 12 months after the procedure.

RESULTS

In the intention-to-treat analysis, there were no significant between-group differences in the change from baseline to 12 months in any primary outcome. The mean changes (improvements) in the primary outcome measures were as follows: Lysholm score, 21.7 points in the partial-meniscectomy group as compared with 23.3 points in the sham-surgery group (between-group difference, −1.6 points; 95% confidence interval [CI], –7.2 to 4.0); WOMET score, 24.6 and 27.1 points, respectively (between-group difference, –2.5 points; 95% CI, –9.2 to 4.1); and score for knee pain after exercise, 3.1 and 3.3 points, respectively (between-group difference, –0.1; 95% CI, –0.9 to 0.7). There were no significant differences between groups in the number of patients who required subsequent knee surgery (two in the partial-meniscectomy group and five in the sham-surgery group) or serious adverse events (one and zero, respectively).

CONCLUSIONS

In this trial involving patients without knee osteoarthritis but with symptoms of a degenerative medial meniscus tear, the outcomes after arthroscopic partial meniscectomy were no better than those after a sham surgical procedure. (Funded by the Sigrid Juselius Foundation and others; ClinicalTrials.gov number, NC100543072.)
Arthroscopic surgery for degenerative tears of the meniscus: a systematic review and meta-analysis

Moin Khan MD, Nathan Evaniew MD, Asheesh Bedi MD, Olufemi R. Ayeni MD MSc, Mohit Bhandari MD PhD

Abstract

Background: Arthroscopic surgery for degenerative meniscal tears is a commonly performed procedure, yet the role of conservative treatment for these patients is unclear. This systematic review and meta-analysis evaluates the efficacy of arthroscopic meniscal débridement in patients with knee pain in the setting of mild or no concurrent osteoarthritis of the knee in comparison with nonoperative or sham treatments.

Methods: We searched MEDLINE, Embase and the Cochrane databases for randomized controlled trials (RCTs) published from 1946 to Jan. 20, 2014. Two reviewers independently screened all titles and abstracts for eligibility. We assessed risk of bias for all included studies and pooled outcomes using a random-effects model. Outcomes (e.g., function and pain relief) were dichotomized to short-term (<6 mo) and long-term (≥2 yr) data.

Results: Seven RCTs (n = 805 patients) were included in this review. The pooled treatment effect of arthroscopic surgery did not show a significant or minimally important difference (MID) between treatment arms for long-term functional outcomes (standardized mean difference [SMD] 0.07, 95% confidence interval [CI] −0.10 to 0.23). Short-term functional outcomes between groups were significant but did not exceed the threshold for MID (SMD 0.23, 95% CI 0.02 to 0.43). Arthroscopic surgery did not result in a significant improvement in pain scores in the short term (mean difference [MD] 0.20, 95% CI −0.67 to 0.26) or in the long term (MD −0.06, 95% CI −0.28 to 0.15). Statistical heterogeneity was low to moderate for the outcomes.

Interpretation: There is moderate evidence to suggest that there is no benefit to arthroscopic meniscal débridement for degenerative meniscal tears in comparison with nonoperative or sham treatments in middle-aged patients with mild or no concurrent osteoarthritis. A trial of nonoperative management should be the first-line treatment for such patients.

Figure 3: Pooled short-term outcomes based on a minimal important difference (MID).

Note: CI = confidence interval

Figure 4: Pooled long-term outcomes based on a minimal important difference (MID).

Note: CI = confidence interval.
We need to create trustworthy guidelines according to new definition and standards

New definition

“Clinical Practice Guidelines are statements that include recommendations intended to optimize patient care. They are informed by a systematic review of evidence and an assessment of the benefits and harms of alternative care options “

New standards
Imagine you found a trustworthy guideline

- Huge duplication, lots of work
- Are these guidelines
  - Available, useful and understandable for clinicians?
  - Suited for integration into EMRs, EBM textbooks and adaptation?
  - Sufficiently up to date?
  - Facilitating shared decisions?
- 2010: No available tools
- We need
Guideline authoring and publication platform (MAGICapp)

- New evidence
- Dynamic updating
- Multilayered formats for all devices

Database structured and tagged content

Decision aids for patients and clinicians

Integrated in the EMR

Adaptation
  - National/ local or EBM Textbooks

- PICO
- Individual studies
- Descriptive tables
- Evidence profiles
- Recommendations
- Key information
- Rationale

MAGIC with DECIDE
1 Surgery for degenerative meniscal tears

Strong recommendation

Benefits clearly outweigh the drawbacks/harms.

In patients with degenerative meniscal tears we recommend not performing arthroscopic partial meniscectomy.

Benefits and harms

For patients treated with arthroscopic partial meniscectomy compared to sham-surgery at 3 month follow up:

- No important difference in pain (SMD 0.2 higher, 95% CI: 0.67 lower to 0.26 higher) or function (SMD 0.25 higher, 95% CI: 0.02-0.48 higher)
- Risk of deep venous thrombosis (8/1000), surgical complications (5/1000), infections (5/1000), cardiovascular events (3/1000) and death (1/1000)

Quality of evidence

We have moderate to high confidence in the effect-estimates for pain and function (systematic review of 4 trials, 800 patients) and risk estimates for adverse events (register-study of 14391 patients)

Preference and values

We believe all or nearly all patients being well-informed about the lacking benefits and potential risks of partial meniscectomies would elect not to undergo such procedures and rather use other treatments (e.g. physical exercise)

Resources and other considerations

Partial meniscectomies is costly (approximately 15 000 NOK/ procedure), places high resource-demands on health care and is not cost-effective (SBU, Sweden 2014)
SHARE IT: Creating discussions in consultations
Integrating recommendations in the EMR, linked to patient specific data
Changing practice requires more than EBM

Surgery for degenerative meniscal tears?

Quality improvement
Measure practice

Apply the recommendation on individual patients

Strong recommendation against meniscectomy

Search for recommendations in evidence-based guidelines

FOCUSED QUESTIONS

Strong recommendation

In patients with degenerative meniscal tears we recommend not performing arthroscopic partial meniscectomy

References | Evidence Profiles | Recommendations

Search for recommendations

Background Text | Add Recommendation

Options
Health care and society face major challenges

“The best way to predict the future is to create it.”

Abraham Lincoln
The Evidence Ecosystem: Main objective

To create a digital evidence ecosystem connecting people - performing primary research, systematic reviews, guidelines, computerized decision support (CDS) and quality improvement - with innovative technological platforms, facilitating the creation, dissemination and implementation of trustworthy evidence in clinical practice.
A trustworthy and digital evidence ecosystem
Meniscus surgery: No more waste in Norway?

January 2013: RCT in NEJM

November 2014 Systematic review published

March 2015 ad hoc: Strong rec against surgery

Document change in practice, repeat quality measurement. What are we waiting for?

Barriers:
- Surgeons hiding
- Funding (DRG)
- Silos of people
- No explicit links

Reducing waste?
If implemented November 2014? 100 mill Euros saved by now
Steroids in pneumonia: WikiRecs as alternative approach

19 January 2015: RCT in Lancet

Day 30: Systematic review submitted to journal

11 August 2015: Systematic review and WikiRecs published

Recommendation can be integrated in the EMR...

We can do shared decision-making...

Document change in practice, in the EMR, in registries...

What are we waiting for?

Increasing value?

If implemented March 2015? 300 lives saved in Norway
Take home messages

- Advances in standards, systems and tools for EBM
- Technology will play a key role in creating, disseminating and updating trustworthy evidence in a digital world
- EBM not enough: Evidence Ecosystem a solution?
- Equally important as technology is collaboration and sharing of information: A true collaborative culture, lots of work (and perhaps some more magic ;-)
Low dose aspirin vs. no treatment for primary prevention

Among a 1000 patients like you, with aspirin

**Mortality**
- **6 fewer**
- at 10 years
- No treatment: 100 per 1000
  - Aspirin: 94 per 1000
- Certainty: Moderate

**Myocardial infarctions**
- **28 fewer**
- at 10 years
- No treatment: 121 per 1000
  - Aspirin: 93 per 1000
- Certainty: High

**Major extracranial bleeding**
- **20 more**
- at 10 years
- No treatment: 37 per 1000
  - Aspirin: 57 per 1000
- Certainty: High

Choose and compare outcomes

- Mortality
- Myocardial infarctions
- Non-fatal stroke
- Major extracranial bleeding
- Practical consequences