Does this patient have a torn meniscus or ligament of the knee: value of the physical examination


Authors' objectives
To analyse the accuracy of the clinical examination for meniscal or ligamentous knee injury.

Searching
MEDLINE and HealthSTAR were searched from inception to 2000. The keywords included: 'knee', 'physical examination', 'internal derangement', 'anterior cruciate ligament', 'posterior cruciate ligament', 'medial collateral ligament', 'lateral collateral ligament' and 'meniscus'. The references lists from relevant articles were handsearched. The searches were limited to studies reported in the English language.

Study selection
Study designs of evaluations included in the review
Diagnostic accuracy studies were included.

Specific interventions included in the review
Studies that compared the performance of the physical examination of the knee with a reference standard were eligible for inclusion. The types of physical examination manoeuvres in the included studies were: general examination, anterior draw test, lateral pivot shift test, Lachmann test, joint line tenderness, posterior draw test, McMurray test, Apley compression test, medial-lateral grind test, joint effusion and combinations of these manoeuvres.

Reference standard test against which the new test was compared
The reference standards in the included studies were arthroscopy and arthroscopy/arthrotomy.

Participants included in the review
Studies of patients with suspected meniscal or ligamentous injury (acute or chronic) of the knee were eligible.

Outcomes assessed in the review
The authors do not report any inclusion criteria with regards to the outcomes. The outcome measures presented in the review included sensitivity, specificity and the likelihood ratio (LR).

How were decisions on the relevance of primary studies made?
The authors do not state how the papers were selected for the review, or how many of the reviewers performed the selection.

Assessment of study quality
Methodological quality was assessed using a standardised scoring system (see Other Publications of Related Interest no.1). The scoring system included assembly of the study, the relevance of the patient enrolled, the appropriateness and completeness of the reference standard, and the blinding of the examiner. The scores were used to group studies into four levels of evidence. The methodological quality of each article was graded by two reviewers.

Data extraction
The authors do not state how the data were extracted for the review, or how many of the reviewers performed the data extraction.

The data were extracted under the headings of number of participants, patient population, reference standard, and examination manoeuvre. Sensitivity and specificity were calculated, as well as the LRs with 95% confidence intervals.
Methods of synthesis

How were the studies combined?
The studies were combined using a random-effects model to calculate a summary LR (see Other Publications of Related Interest no.2).

How were differences between studies investigated?
The studies were grouped according to the type of injury and manoeuvre. The authors do not report a statistical method for assessing heterogeneity.

Results of the review

Twenty-three diagnostic accuracy studies (n=1,959) were included.

Medial or lateral cruciate ligament examination. There were no studies that adequately examined the diagnostic accuracy of the physical examination for medial or lateral cruciate ligament lesions.

Anterior cruciate ligament examination. Using the anterior draw test (3 studies, n=138), the summary LRs were 3.8 (95% CI: 0.7, 22.0) for a positive examination and 0.30 (95% CI: 0.05, 1.50) for a negative examination. Using the Lachmann test (1 study, n=41), the summary LRs were 42.0 (95% CI: 2.7, 651.0) and 0.1 (95% CI: 0.0, 0.4) for a positive and negative examination, respectively.

Using the composite assessment (3 studies, n=428), the summary LRs were 25.0 (95% CI: 2.1, 306.0) and 0.04 (95% CI: 0.01, 0.48) for a positive and negative examination, respectively.

Posterior cruciate ligament examination.

The LRs could not be generated for any specific examination manoeuvre for a posterior ligament tear.

Using the composite assessment (2 studies, n=274), the summary LRs were 21.0 (95% CI: 2.1, 205.0) for a positive examination and 0.05 (95% CI: 0.01, 0.50) for a negative examination.

Meniscal examination.

Using the McMurray test (3 studies, n=344), the summary LRs were 1.3 (95% CI: 0.9, 1.7) for a positive examination and 0.8 (95% CI: 0.6, 1.1) for a negative examination.

For joint line tenderness (2 studies, n=244), the summary LRs were 0.9 (95% CI: 0.8, 1.0) and 1.1 (95% CI: 1.0, 1.3) for a positive and negative examination, respectively.

Using the composite assessment (5 studies, n=594), the summary LRs were 2.7 (95% CI: 1.4, 5.1) and 0.4 (95% CI: 0.2, 0.7) for a positive and negative examination, respectively.

Authors’ conclusions

The composite examination for specific meniscal or ligamentous injuries of the knee performed much better than specific manoeuvres. This suggested that the synthesis of a group of examination manoeuvres and historical items may be required for adequate diagnosis.

CRD commentary

The methodology of this review was, on the whole, satisfactory and the authors posed a suitable review question. However, the inclusion criteria for the review were not reported very clearly, e.g. the authors did not report the inclusion criteria with regard to the outcomes. The search was adequate but there remains the possibility that some
important studies were missed. The processes by which the studies were selected and the data extracted, and the number of reviewers involved, were not described. The authors carried out a suitable assessment of methodological quality and details of the studies were reported well. The studies were combined using appropriate statistical methods, but were pooled without testing for heterogeneity. A formal investigation of heterogeneity was warranted given the differences in the patient populations between the included studies.

The authors' conclusions follow from the data presented, but should be viewed with caution due to the methodological problems described and the poor quality of the included studies.

Implications of the review for practice and research
Practice: The authors recommend that a 'composite examination' is undertaken, including taking a basic history and a series of physical examination tests.

Research: The authors did not state any implications for further research.

Funding
American Academy of Orthopedic Surgeons.

Bibliographic details

PubMedID
11585485

Original Paper URL
http://jama.ama-assn.org/

Other publications of related interest

Indexing Status
Subject indexing assigned by NLM

MeSH
Anterior Cruciate Ligament /injuries; Arthroscopy; Clinical Competence; Humans; Knee Injuries /diagnosis /epidemiology; Ligaments, Articular /injuries; Magnetic Resonance Imaging; Menisci, Tibial /injuries; Physical Examination; Posterior Cruciate Ligament /injuries; Sensitivity and Specificity

AccessionNumber
12001008385

Date bibliographic record published
31/03/2003

Date abstract record published
31/03/2003
Record Status
This is a critical abstract of a systematic review that meets the criteria for inclusion on DARE. Each critical abstract contains a brief summary of the review methods, results and conclusions followed by a detailed critical assessment on the reliability of the review and the conclusions drawn.