

**A critical appraisal of “Surgery versus Physical Therapy for a
Meniscal Tear and Osteoarthritis”**

By

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Abstract

“Surgery versus Physical Therapy for a Meniscal Tear and Osteoarthritis” effectively employs a randomized, controlled trial and uses credible outcome measures and statistical analyses.

Current literatures from primary sources are often used in the study’s defense as well. Several limitations impact this study, however. 35% of physical therapy alone group patients crossed over to surgery within one year, severely impacting the aim and goal. Physical therapy protocols were also unstandardized regarding exercises and number of treatments. Efficacy of physical therapy treatment is thus hard to conclude. Overall, many takeaways can be gained from this study’s results although its limitations limit these takeaways to generalizations.

Key words

Surgery, physical therapy, meniscal tear

Introduction

Many older populations suffer from knee osteoarthritis and torn menisci. As cartilage in the knee degenerates or is injured in these populations, quality of life is impacted as knee pain impacts their activities of daily living. Multiple options exist for treatment of torn menisci, namely physical therapy and arthroscopic surgery. Research on the efficacy of arthroscopic surgery and physical therapy versus physical therapy alone is still limited. This critical appraisal aims to examine and evaluate the evidence within “Surgery versus Physical Therapy for Meniscal Tears and Osteoarthritis” to determine if surgery is a valuable intervention in addition to physical therapy for meniscal tears.

Methods

PubMed.gov and Google Scholar were utilized to search for studies comparing arthroscopic surgery and physical therapy and physical therapy alone for torn knee menisci treatment. “Torn meniscus physical therapy arthroscopic surgery” was used as a search phrase. No limits, inclusions, or exclusions were placed on the search as generated results were relevant to the research question. 11 search results were generated on PubMed.gov, while Google scholar generated about 20,000.

The first result generated on Google Scholar, “Surgery versus Physical Therapy for a Meniscal Tear and Osteoarthritis,” was chosen for critical appraisal as it directly responds to the research question and studies the 45 and older population, of which knee osteoarthritis is prevalent. The article was originally published in *The New England Journal of Medicine* in 2013. The study was conducted in seven United States tertiary referral centers by physicians and physical therapists. Specific locations included Rush University Medical Center in Chicago,

Illinois, Brigham and Women's Hospital in Boston, Massachusetts, Mayo Clinic in Rochester, Minnesota, Washington University in St. Louis, School of Medicine in St. Louis, Missouri, Hospital for Special Surgery in New York, New York, Cleveland Clinic in Cleveland, Ohio, and Vanderbilt University in Nashville, Tennessee. The study is principally investigated by Jeffrey N. Katz, MD, MS of Brigham and Women's Hospital.

Results

Summary of the study

In this study, a randomized, controlled trial was performed with 351 enrolled patients to distinguish pain and functional status outcomes of arthroscopic partial meniscectomy (APM) versus physical therapy for meniscal tears. Patients enrolled were 45 years or older with torn menisci and detected osteoarthritis on magnetic resonance imaging (MRI). They were then randomized in a 1:1 ratio to a treatment group after being grouped by sex and Kellgren-Lawrence grade of osteoarthritis. Outcome measures used were the Western Ontario and McMaster Universities Osteoarthritis Index (WOMAC), Knee Injury and Osteoarthritis Outcome Scale (KOOS), and Medical Outcomes Study 36-Item Short-Form Health Survey (SF-36). Follow-up surveys were conducted at baseline and at 3, 6, and 12 months post-randomization. Primary analysis of results was conducted using an analysis of covariance with changes in WOMAC from baseline to 6 months. Secondary analyses utilized an analysis of covariance with use of either KOOS or SF-36 as dependent variables and a logistic regression. The mean improvement in WOMAC scores between initial test and 6-month follow-up was 20.9 points in APM patients and 18.5 points in physical therapy patients. The mean improvement in KOOS

scores between initial test and 6-month follow-up was 24.2 points in APM patients and 21.3 points in physical therapy patients. While 30% crossover of physical therapy alone group patients electing to get APM did occur, no statistical significant differences were found in outcome measures between physical therapy group alone patients and APM with physical therapy patients.

Appraisal of the study introduction

The introduction of this article effectively outlines the prevalence of meniscal tears in the United States population. They also showed how there is a lack of research in the management of symptoms of meniscal tears. All literatures used in the introduction are current and from primary sources.

While written well, the introduction could be stronger by explaining the designed outcome measure, Meniscal Tear in Osteoarthritis Research (METEOR), in further detail. That is, specific dependent variables associated METEOR could have been addressed.

Appraisal of the study methods

The study had similar research groups in that participants were 45 years of age or older and currently had a meniscal tear and imaging evidence of mild-to-moderate knee osteoarthritis. Patients with normal MRI and radiography results were eligible based on having one symptom of a meniscal tear, evidenced by a sourced study. The study appropriately utilizes an experimental research design, prospective direction, and longitudinal duration. Qualified patients were well-defined by the study and patients were randomly assigned to groups after being divided by sex and extent of Kellgren-Lawrence knee osteoarthritis. Treatment timetables and protocols were largely well-defined, though could be improved. The surgical protocol was well-explained and the physical therapy protocol appropriately

divided patients into acute, subacute, and advanced phases, defined by progression criteria. Statistical analyses, largely analysis of covariance, used in the study was appropriate and well-defined. Overall, the experiment is mostly replicable, though a few challenges will present.

Weaknesses of the methods of this study are largely contained in the physical therapy intervention. Only most of the therapists were board-certified. The physical therapy protocol presents additional weaknesses as many specifics are not included. It is not possible to ascertain exactly which exercises the patients were performing as the protocol states “Perform at least 8 exercises, 12-15 repetitions, 1-2 sets of the following types of exercises.” Some exercises may be working better than others for patients and some patients may benefit from performing greater than 8 exercises. The article then states the program lasted “about 6 weeks.” While patients may progress differently from one another, greater standardization is needed to determine the true efficacy of physical therapy intervention.

Appraisal of the study results

“Surgery versus Physical Therapy for a Meniscal Tear and Osteoarthritis” effectively organizes and explains its results. Results are presented in detailed flow charts and figures which are easy to understand. The primary and secondary outcome measures are presented in the same order throughout the article. Groups were divided effectively. Though there was crossover in which physical therapy alone group patients elected to get arthroscopic partial meniscectomies, the study accounts for these groups, measuring each one independently in specific time intervals in which the crossover happened.

While results were organized, detailed, and groups were well-managed, some weaknesses were apparent. For the physical therapy intervention, physical therapy alone group was scheduled for an average 9.3 visits, while attending an average 8.4 visits and the arthroscopic partial meniscectomy group was scheduled for an average 7.4 visits, while attending an average 6.9 visits. Because the groups were

not managed the same regarding physical therapy, efficacy of physical therapy cannot be accurately assessed. Some subject attrition occurred in this study as 351 patients were enrolled and 330 actively participated. While the study provides a detailed description of adverse events happening to patients assigned to treatment, reasons which attrition occurred are left unstated. This may have impacted the results (e.g. subjects may have dropped out of physical therapy, and the study altogether, after arthroscopic partial meniscectomy because they felt satisfied with greater function and less pain, thus hindering APM group outcome measure scores). Perhaps the greatest result impact could have come from crossover of physical therapy alone subjects to undergoing arthroscopic partial meniscectomy, even though this was accounted for by a separate group in the results. 35% of patients in the physical therapy group crossed over to APM within the first 12 months. As a result, the true impact of physical therapy intervention alone cannot be accurately assessed.

Appraisal of the study discussion

The authors effectively indicate meanings of their findings in the discussion. They appropriately note that the results “may help guide management in the care of patients with knee symptoms” and demonstrate that “an initial nonoperative strategy” is appropriate, which is backed by results. While there are several limitations present, partially due to the nature of the study, generalizations can still be taken. The authors again showed the need for their research, referencing one prior similar study which was the first comparable study conducted to their knowledge.

Most limitations are recognized in the discussion section by the authors, though no mention is made of flaws in the physical therapy intervention as it is unstandardized regarding exercise

routines and number of visits between groups. Also, no mention is made that only most therapists were board certified.

Discussion

This study has major implications for the field of physical therapy and is directly relevant to my clinical question, “Is surgery followed by physical therapy or is physical therapy alone a more effective treatment for pain and functional status?”. If surgery followed by physical therapy is not a more effective intervention for meniscal tears than only doing physical therapy rehabilitation, more patients will elect to pursue physical therapy. Also, physical therapy is less invasive and would eliminate surgical side effects such as infection.

Until follow-up studies are conducted which can minimize all biases, particularly minimizing patient crossover throughout the study, physical therapy is a better initial intervention for meniscal tear patients to pursue. Although overall adverse events between groups in “Surgery versus Physical Therapy for a Meniscal Tear and Osteoarthritis” showed no significant differences, the study makes no mention of infections, and even if none occurred, the patient can be at elevated risk from surgical intervention. The invasive aspect and cost of surgery is also unnecessary unless patients do not achieve desired results from physical therapy alone. If physical therapy is not producing desired results, APM is worth consideration. Within crossover patients from physical therapy alone to APM group, 30% within 6 months and 35% within one year, WOMAC scores significantly decreased after crossover. Follow-up studies could improve the case for APM as the preferred initial intervention, though the study’s data suggests physical therapy should be pursued first.

Evidence from the article warrants discussion with meniscal tear patients. A large sample size was captured in the study, valid and reliable outcome measures were used, and groups were effectively divided to capture results. The data conclusively suggests, apart from the “PT, crossover >6 mo” group from the 3-6-month time interval in WOMAC scores, physical therapy aids symptoms of meniscal tear. Patients should be encouraged to try physical therapy first based on this evidence. Patients should also be made aware that surgery followed by physical therapy versus physical therapy alone is inconclusive.

While its limitations inhibit conclusive findings in “Surgery versus Physical Therapy for a Meniscal Tear and Osteoarthritis,” valuable generalizations are found.