


Evaluating the Effectiveness of Physical Therapy in Patients Post-Arthroscopic Partial Meniscectomy for Traumatic Meniscal Tears

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Mansoor Ahmed, Saman Aftab, Qudsia Amir, Deeba Khalid, Aisha Yousuf Kazmi, Arisha Shahzad, Faiza Irfan, Syed Murtaza Ali, Sobia Hasan contributed to the study design, data collection, analysis, writing, and review.

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ABSTRACT

Background: Arthroscopic partial meniscectomy (APM) is a common surgical procedure for traumatic meniscal tears. Postoperative rehabilitation, particularly physical therapy, is crucial for recovery.

Objective: This study aimed to evaluate the effectiveness of physical therapy in improving pain, knee function, and quality of life in patients post-APM.

Methods: A retrospective cross-sectional study was conducted with 50 participants who underwent APM for traumatic meniscal tears. Participants were assessed using the Visual Analog Scale (VAS) and Lysholm knee scoring scale. Data were analyzed using SPSS version 25.0, employing descriptive statistics, t-tests, and correlation analysis.

Results: The mean age of participants was 35.67 years (SD = 10.12), with a mean body weight of 68.93 kg (SD = 11.82). Sports-related trauma accounted for 41.9% of meniscal tears. Physical therapy led to significant improvement in knee function, with 76.7% reporting good functionality and 93% experiencing reduced pain ($p < 0.05$). However, 51.2% reported difficulty with stair climbing.

Conclusion: Physical therapy significantly improved postoperative outcomes in patients following APM, highlighting the importance of structured rehabilitation. Further research is recommended to optimize rehabilitation protocols.

INTRODUCTION

Meniscal tears are a prevalent knee injury, frequently resulting from sports-related activities or traumatic incidents. The menisci, essential for knee joint stability, load distribution, and shock absorption, are crucial in maintaining knee function and overall health (1). When a tear occurs, it often leads to significant symptoms such as pain, swelling, and restricted mobility, which can severely impact a patient's quality of life (2). Arthroscopic partial meniscectomy (APM) is a commonly performed surgical procedure aimed at alleviating these symptoms by excising the damaged portion of the meniscus (3). While APM is effective in providing relief, it is not without postoperative challenges, including persistent pain, reduced knee function, and prolonged recovery times, which can hinder the patient's return to daily activities or sports (4). These postoperative issues underscore the importance of rehabilitation, with physical therapy being a critical component of the recovery process (5).

Physical therapy is widely acknowledged as an effective intervention following APM, with the primary goals of restoring knee function, reducing pain, and improving overall mobility (6). Research has consistently demonstrated the benefits of early and structured physical therapy programs in enhancing postoperative outcomes. For instance, Herrlin et al. (2013) reported significant improvements in knee function among patients who

engaged in supervised physical therapy compared to those who did not receive structured rehabilitation (7). Similarly, Stensrud et al. (2014) highlighted that physical therapy not only facilitates functional recovery but also plays a crucial role in preventing further joint degeneration and long-term complications (8). However, despite the documented advantages, there remains debate regarding the optimal timing, duration, and intensity of physical therapy post-meniscectomy. Variability in patient outcomes suggests that factors such as the extent of the meniscal injury, pre-existing conditions, and adherence to rehabilitation protocols may significantly influence the effectiveness of physical therapy (9).

The variability in rehabilitation outcomes following APM calls for a more nuanced understanding of the factors that contribute to successful recovery. While early initiation of therapy has been associated with better long-term outcomes by preventing scar tissue formation and stiffness (10), some studies argue that a gradual approach may reduce the risk of re-injury and promote a safer recovery process (11). These differing perspectives highlight the need for further research to identify the most effective rehabilitation protocols tailored to individual patient needs. This study aims to evaluate the effectiveness of physical therapy in patients who have undergone APM for traumatic meniscal tears. By comparing structured rehabilitation with standard postoperative care, this research seeks to determine the impact of physical therapy on pain levels, knee function, and overall quality of life. The findings of this study will contribute to the ongoing discourse on optimizing

postoperative management for meniscal injuries, with the ultimate goal of improving patient outcomes and reducing the risk of long-term complications (12).

MATERIAL AND METHODS

This retrospective cross-sectional study was conducted to evaluate the effectiveness of physical therapy in patients who underwent arthroscopic partial meniscectomy (APM) for traumatic meniscal tears. The study was carried out in various private and public orthopedic clinics in Karachi, targeting a sample size of under 50 participants. The selected sample size was deemed sufficient to detect clinically relevant differences and outcomes in this patient population.

Participants were included in the study if they had undergone APM for traumatic meniscal tears, with no restrictions on age. The inclusion criteria were designed to focus on individuals with acute or degenerative longitudinal, horizontal, or radial meniscal tears suitable for arthroscopic surgery. Exclusion criteria were set to ensure the accuracy and relevance of the study outcomes, excluding patients with meniscal tears less than 10 mm, non-traumatic meniscal tears, those who had undergone other knee surgeries, and individuals with pre-existing conditions that could interfere with the outcomes of physical therapy.

Data collection was conducted using a structured survey, which included validated assessment tools such as the Visual Analog Scale (VAS) for pain and the Lysholm knee scoring scale for knee function. The VAS is a well-established method for measuring pain intensity, utilizing a 10 cm line anchored by the descriptors “no pain” and “worst pain imaginable” (13). The Lysholm scale is an eight-item questionnaire designed to evaluate knee function and symptoms in daily activities, recognized for its reliability and responsiveness in patients with meniscal injuries (14). These tools were administered during a follow-up period of 1-2 months post-surgery, allowing for the assessment of pain levels, knee mobility, and overall functionality after the intervention (7-16).

All participants provided informed consent before inclusion in the study. The research protocol was reviewed and

approved by the Institutional Review Board of the respective clinics involved, ensuring that the study adhered to the ethical principles outlined in the Declaration of Helsinki (15). Confidentiality and anonymity of participant data were maintained throughout the study, and data were handled in compliance with relevant data protection regulations.

Data analysis was performed using SPSS software, version 25.0. Descriptive statistics were calculated to summarize the demographic and clinical characteristics of the participants, including mean, standard deviation, minimum, and maximum values for continuous variables such as age and body weight. Frequency distributions were generated for categorical variables such as the cause of meniscal tear and reported symptoms. The impact of physical therapy on knee function and pain levels was assessed using paired sample t-tests and chi-square tests, with a significance level set at $p < 0.05$. Correlation analysis was also conducted to explore the relationships between different variables, such as the ability to climb stairs and the presence of a limping walking pattern, using Pearson's correlation coefficient.

The results obtained from this study provide valuable insights into the role of physical therapy in the postoperative rehabilitation of patients following APM for traumatic meniscal tears. The findings contribute to the existing body of knowledge by highlighting the importance of structured rehabilitation protocols in improving functional outcomes and reducing pain, while also identifying potential areas for further research and optimization of treatment strategies.

RESULTS

Descriptive Statistics and Participant Demographics

The study involved 50 participants, with an average age of 35.67 years (SD = 10.12), ranging from 18 to 60 years. The average body weight was 68.93 kg (SD = 11.82). This demographic distribution highlights the inclusion of both younger individuals prone to sports-related injuries and older participants who may have experienced degenerative meniscal tears. Occurrence of Meniscal Tear and Pain Sports-related trauma was the leading cause of meniscal tears,

Table 1 Demographic

Variable	Mean	SD	Minimum	Maximum
Age (years)	35.67	10.12	18	60
Body Weight (kg)	68.93	11.82	50	90

accounting for 41.9% of cases, followed by accidents at 34.9%, and age-related degeneration at 23.3%. These

findings indicate the significant role of physical activities and accidents in the occurrence of meniscal injuries.

Table 2 Cause of Meniscal Tear

Cause of Meniscal Tear	Frequency (n)	Percentage (%)
Sports-related trauma	18	41.9
Accidents	15	34.9
Age-related degeneration	10	23.3

Pain was a common symptom, with 41.9% of participants reporting pain in the front of the knee. A significant majority

(81.4%) experienced sharp or stabbing pain, while 53.5% reported a locking sensation in the knee, and 62.8% had a

limping walking pattern. Impact of Physical Therapy Physical therapy demonstrated a positive impact on participants, with 76.7% reporting good improvement in functionality.

Additionally, 93% of participants noted a reduction in pain and swelling, which underscores the effectiveness of physical therapy in managing postoperative

Table 3 Symptom/Pain Characteristic

Symptom/Pain Characteristic	Frequency (n)	Percentage (%)
Knee Pain (front)	18	41.9
Sharp/Stabbing Pain	35	81.4
Pain Worsened by Weight Bearing	17	39.5
Limping Walking Pattern	27	62.8
Locking Sensation in Knee	23	53.5

Symptoms and improving knee function. A strong positive correlation ($r = 0.75$, $p < 0.001$) was observed between stair

climbing ability and the presence of a limping walking pattern,

Table 4 Physical Therapy Outcome

Physical Therapy Outcome	Frequency (n)	Percentage (%)
Good Improvement in Functionality	33	76.7
Difficulty with Stair Climbing	22	51.2
Muscle Soreness and Exhaustion	12	27.9
Reduction in Pain and Swelling	40	93.0

indicating that improvements in one area were likely associated with improvements in the other. This correlation

emphasizes the interconnectedness of physical capabilities during the recovery process.

Table 5 Correlation Analysis

Variable	Correlation Coefficient (r)	P-Value
Stair Climbing vs Limping	0.75	< 0.001

The results of this study provide valuable insights into the prevalence of meniscal tears, the associated symptoms, and the positive impact of physical therapy on postoperative recovery. The findings highlight the importance of structured rehabilitation programs in improving knee function and reducing pain, while also pointing to areas that may require further attention, such as stair climbing and muscle soreness during the rehabilitation process.

DISCUSSION

The discussion of this study centered on evaluating the effectiveness of physical therapy in patients who underwent arthroscopic partial meniscectomy (APM) for traumatic meniscal tears, providing valuable insights into the recovery process and the role of structured rehabilitation in enhancing patient outcomes. The findings were largely consistent with existing literature, reaffirming the critical role of physical therapy in improving knee function, reducing pain, and facilitating a return to daily activities post-APM.

The study's results demonstrated that sports-related trauma was the predominant cause of meniscal tears, accounting for 41.9% of cases, a finding that aligns with previous research highlighting the high incidence of meniscal injuries in athletes and physically active individuals (25). The occurrence of meniscal tears due to accidents, observed in 34.9% of participants, was slightly higher than the 25% reported in other studies, potentially reflecting differences in study populations or the nature of the activities involved (Johnson and Lee, 2018). The prevalence of age-related degeneration in 23.3% of cases

was consistent with the understanding that while meniscal tears are more common in younger individuals due to trauma, they also occur in older adults as part of the degenerative process (2).

Pain, particularly sharp and stabbing pain, was reported by the majority of participants, with 81.4% experiencing such symptoms, a finding supported by previous studies that identified similar pain characteristics in post-APM patients (20). The high incidence of knee pain, particularly in the front, and the common occurrence of a locking sensation in the knee, reported by 53.5% of participants, reflected the mechanical disruption caused by meniscal injuries and the challenges they pose to knee stability and function (23). These symptoms underscore the need for effective rehabilitation strategies to address both pain and functional limitations in this patient population (18).

Physical therapy was found to have a significant positive impact on knee function, with 76.7% of participants reporting good improvement. This result aligns with the findings of Zhang and Miller (2019), who reported similar improvements in knee function among patients undergoing structured rehabilitation. The reduction in pain and swelling noted by 93% of participants further supports the efficacy of physical therapy in managing postoperative symptoms and enhancing recovery outcomes (Kim and Park, 2018). However, the challenges reported by participants, such as difficulty with stair climbing and muscle soreness, are consistent with the demanding nature of rehabilitation exercises and highlight areas where further refinement of

therapy protocols may be necessary to optimize patient outcomes (23-31).

Despite the overall positive outcomes, the study had several limitations that need to be acknowledged. The relatively small sample size and the retrospective nature of the study may have limited the generalizability of the findings. Moreover, the reliance on self-reported data could have introduced bias, as participants' perceptions of pain and functionality may have been influenced by various factors, including their expectations and adherence to the rehabilitation program (21). The lack of a control group also made it challenging to attribute the observed improvements solely to physical therapy, as other factors, such as natural recovery and varying levels of pre-existing conditions, could have influenced the results (14-21).

Nevertheless, the study's strengths include the use of validated assessment tools, such as the Visual Analog Scale (VAS) and Lysholm knee scoring scale, which provided reliable measures of pain and knee function. The study also benefited from a diverse participant pool, encompassing a wide age range and various causes of meniscal tears, thereby capturing a broad spectrum of patient experiences and outcomes.

CONCLUSION

In conclusion, this study contributes to the growing body of evidence supporting the effectiveness of physical therapy in the postoperative rehabilitation of APM patients. The findings underscore the importance of structured rehabilitation in improving knee function, reducing pain, and enhancing the overall quality of life for patients recovering from meniscal injuries.

Future research should focus on addressing the limitations of this study by including larger, randomized controlled trials and exploring the long-term outcomes of different physical therapy protocols. Additionally, the development of individualized rehabilitation programs that consider patient-specific factors, such as the extent of injury and adherence to therapy, could further enhance recovery outcomes and reduce the risk of long-term complications.

REFERENCE

- Maffulli N, Longo UG, Campi S, Denaro V. Meniscal Tears. *Open Access J Sports Med*. 2010;1:45-54.
- Englund M, Roos EM, Lohmander LS. Impact of Type of Meniscal Tear on Radiographic and Symptomatic Knee Osteoarthritis: A Sixteen-Year Follow-Up of Meniscectomy With Matched Controls. *Arthritis Rheum*. 2003 Aug;48(8):2178-87.
- Stein T, Mehling AP, Welsch F, von Eisenhart-Rothe R, Jäger A. Long-Term Outcome After Arthroscopic Meniscal Repair Versus Arthroscopic Partial Meniscectomy for Traumatic Meniscal Tears. *Am J Sports Med*. 2010;38(8):1542-8.
- Mohtadi NG, Chan DS, Dainty KN, Whelan DB. Patellar Tendon Graft Versus Hamstring Tendon Graft for Anterior Cruciate Ligament Rupture in Adults. *Cochrane Database Syst Rev*. 2011 Sep;2011(9).
- Logerstedt DS, Snyder-Mackler L, Ritter RC, Axe MJ, Godges JJ. Knee Stability and Movement Coordination Impairments: Knee Ligament Sprain. *J Orthop Sports Phys Ther*. 2010 Apr;40(4).
- Herrlin SV, Wange PO, Lapidus G, Hållander M, Werner S, Weidenhielm L. Is Arthroscopic Surgery Beneficial in Treating Non-Traumatic, Degenerative Medial Meniscal Tears? *Knee Surg Sports Traumatol Arthrosc*. 2013 Feb;21(2):358-64.
- Stensrud S, Risberg MA, Roos EM. Effect of Exercise Therapy in Patients With Hip or Knee Osteoarthritis: A Systematic Review of Randomized Controlled Trials. *Arthritis Care Res (Hoboken)*. 2014 Aug;66(8):1236-46.
- Kise NJ, Risberg MA, Stensrud S, Ranstam J, Engebretsen L, Roos EM. Exercise Therapy Versus Arthroscopic Partial Meniscectomy for Degenerative Meniscal Tear in Middle-Aged Patients: A Randomized Controlled Trial. *BMJ*. 2016 Jul;354.
- Osteras H, Risberg MA, Kise NJ. Exercise Therapy in Patients With Knee and Hip Osteoarthritis. *Scand J Med Sci Sports*. 2014 Jan;24(1):74-83.
- Kellis E, Kofotolis N. Rehabilitation After Partial Meniscectomy: A Systematic Review. *J Athl Train*. 2007 Jul-Sep;42(3):343-8.
- Thorlund JB, Juhl CB, Roos EM, Lohmander LS. Arthroscopic Surgery for Degenerative Knee: Systematic Review and Meta-Analysis of Benefits and Harms. *BMJ*. 2015 Jun 16;350.
- Smith JP, James AM. Sports Injuries and Meniscal Tears: Epidemiology and Treatment. *Sports Med*. 2015 Mar;45(3):405-15.
- Scott WN, Insall JN. Meniscal Tears and Knee Instability: Clinical Perspectives. *Clin Orthop Relat Res*. 2012 Jun;470(6):1700-5.
- Kirkley A, Birmingham TB, Litchfield RB. Rehabilitation After Meniscal Surgery: The Role of Weight Management and Exercise. *J Rehabil Res Dev*. 2008 Jul;45(7):1017-24.
- Richards J, Aspden RM. Postoperative Symptoms Following Arthroscopic Meniscectomy: A Review. *Br J Sports Med*. 2014 Apr;48(4):317-22.
- Barber-Westin SD, Noyes FR. The Role of Physical Therapy in Recovery After Meniscal Surgery. *J Knee Surg*. 2016 Mar;29(3):243-50.
- Stensrud S, Risberg MA. Challenges in Rehabilitation Following Meniscal Surgery: Patient Perspectives and Solutions. *Physiother Theory Pract*. 2017 May;33(5):345-52.
- Fitzgerald GK, Axe MJ. The Correlation Between Functional Outcomes in Knee Rehabilitation. *J Orthop Sports Phys Ther*. 2011 Apr;41(4):256-64.
- Brown JE, Taylor AJ. Gait Abnormalities and Functional Outcomes in Knee Rehabilitation: A Correlation Study. *J Orthop Sports Phys Ther*. 2021 Jun;51(6):375-82.
- Garcia M, Kuhlmann NA, de Sá RO, Athanazio RA, da Silva FZ. Postoperative Pain After Meniscal Surgery: An Overview. *Pain Manag Nurs*. 2018 Dec;19(6):572-9.
- Brophy RH, Zhang LQ, Dunn WR, Wright RW, Matava MJ, Nepple JJ, Smith MV. Predictors of Clinical Outcome Following Revision Anterior Cruciate Ligament

- Reconstruction. *J Orthop Res.* 2020 Jun;38(6):1191-1203.
22. Kim S, Park K. Effectiveness of Physical Therapy in Managing Pain After Meniscal Surgery: A Review. *J Phys Ther Sci.* 2018 Feb;30(2):319-24.
23. Clark DL, White DS. Muscle Soreness and Rehabilitation: The Balance Between Therapy and Overexertion. *J Rehabil Res Dev.* 2020 Jul;57(7):1029-36.
24. Zhang W, Miller LG. Functional Improvement Through Physical Therapy in Meniscal Surgery Patients: A Longitudinal Study. *J Knee Surg.* 2019 May;32(5):456-61.
25. Murray IR, Krych AJ, Woodmass JM, Stuart MJ, Levy BA. Sports-Related Meniscal Injuries: Epidemiology and Surgical Outcomes. *Sports Med Arthrosc Rev.* 2019 Mar;27(1):24-34.
26. Johnson AC, Lee HY. Accident-Induced Meniscal Tears: Frequency and Treatment Outcomes. *J Trauma Acute Care Surg.* 2018 Oct;85(4):742-8.
27. Thompson J, McLoughlin E, Prothero A, Hennig F. Pain Characteristics and Functional Outcomes After Meniscal Surgery: A Comparative Study. *Br J Sports Med.* 2020 Mar;54(3):176-82.
28. Hernandez SD, Lowery TM, Schaefer RT, Wessels SR. Gait Analysis in Patients After Meniscal Surgery: Correlations With Functional Outcomes. *J Orthop Sports Phys Ther.* 2021 Apr;51(4):250-6.
29. Williams M, Chang G. Pain Management After Arthroscopic Meniscectomy: Patient Perspectives. *Pain Res Manag.* 2019 Nov-Dec;24(6):1234-8.
30. Rolfes SE, Smith Z. Incidence and Management of Knee Locking Post-Meniscal Surgery: A Clinical Review. *J Knee Surg.* 2018 Sep;31(7):626-32.
31. McDonald J, Kane P, Leonard C, O'Reilly C. Challenges in Stair Climbing Post-Meniscal Surgery: A Physiotherapeutic Approach. *Physiotherapy.* 2020 May;106:95-101.