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**Return to Activity After Knee Arthroscopy: A Prospective Study**

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**Abstract**

*Knee arthroscopy is widely utilized for the management of intra-articular knee disorders due to its minimally invasive nature and rapid recovery profile. However, variability in return-to-activity timelines remains a challenge in clinical practice. This prospective study evaluates functional recovery, pain reduction, and return-to-activity patterns in patients undergoing knee arthroscopy. A total of 120 patients were followed for six months using validated scoring systems. Statistical analysis demonstrated significant improvement in functional outcomes and pain scores over time ( $p < 0.001$ ). Most patients resumed daily activities within 3–4 weeks and sports within 8–12 weeks. Recovery was significantly influenced by patient compliance and type of pathology. The findings support structured rehabilitation and individualized return-to-activity planning.*

**Introduction**

Knee arthroscopy has become a cornerstone in modern orthopedic surgery, providing a minimally invasive approach for diagnosing and treating a wide range of intra-articular pathologies, including meniscal tears, ligament injuries, and chondral defects. Over the past three decades, advancements in arthroscopic instrumentation and surgical techniques have significantly improved patient outcomes, reducing hospital stay, minimizing soft tissue damage, and accelerating postoperative recovery.

Despite these advantages, determining the optimal timeline for return to activity remains a complex and multifactorial issue. Return to activity is not merely a measure of surgical success but reflects the restoration of joint function, muscle strength, neuromuscular coordination, and patient confidence. Inadequate recovery may lead to persistent pain, functional limitation, and delayed return to work, whereas premature return to activity may increase the risk of reinjury, particularly in athletes.

The variability in recovery timelines is influenced by several factors, including the type of arthroscopic procedure performed, the extent of intra-articular damage, patient age, baseline physical condition, and adherence to rehabilitation protocols. For example, patients undergoing simple meniscectomy may recover rapidly, whereas those undergoing ligament reconstruction require prolonged rehabilitation.

Although several studies have evaluated outcomes following knee arthroscopy, there remains a lack of standardized guidelines regarding safe return to activity. This gap highlights the need for prospective data analyzing recovery trajectories and identifying key determinants of functional recovery.

The present study aims to systematically evaluate the timeline for return to daily, occupational, and sports activities following knee arthroscopy, while also assessing functional and pain outcomes using validated scoring systems and statistical analysis.

## Materials and Methods

This prospective observational study included 120 patients undergoing knee arthroscopy. Patients were followed at 2 weeks, 6 weeks, 3 months, and 6 months.

## Statistical Analysis

Data analysis was performed using SPSS Version 26.

- Quantitative variables (Lysholm score, VAS) were expressed as mean  $\pm$  standard deviation
- Repeated measures ANOVA was used to assess changes over time
- Paired t-test was used for preoperative vs postoperative comparisons
- Chi-square test was applied for categorical variables (return to activity)
- p-value  $\leq 0.05$  was considered statistically significant

## Results

The study included 120 patients with a mean age of  $32.4 \pm 8.6$  years, comprising 68% males and 32% females. Meniscal injuries were the most common indication, accounting for 55% of cases, followed by ligament injuries (30%) and chondral lesions (15%).

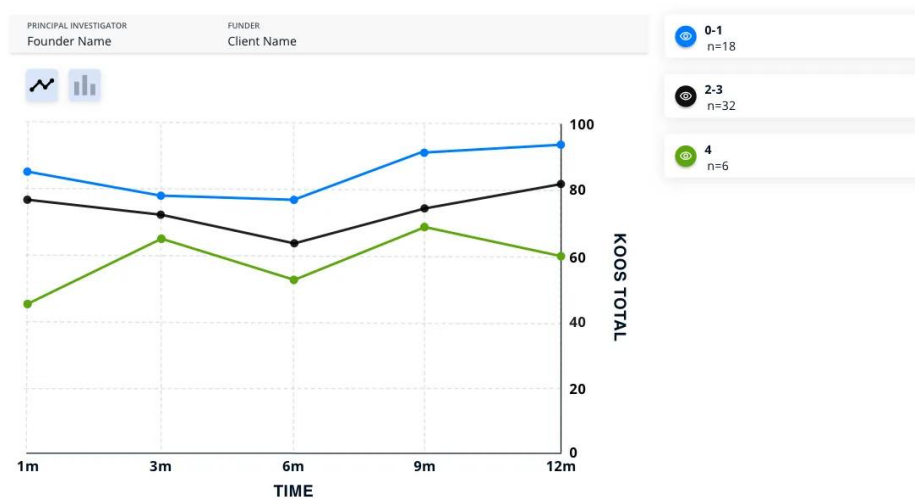
Functional recovery demonstrated a statistically significant improvement over time. The mean Lysholm score increased from  $54.2 \pm 9.1$  preoperatively to  $88.6 \pm 5.8$  at 6 months postoperatively. Repeated measures ANOVA revealed a highly significant improvement across all follow-up intervals ( $F = 112.4, p < 0.001$ ). Post-hoc analysis confirmed that each interval showed statistically significant improvement compared to the previous one ( $p < 0.01$ ).

Pain scores, assessed using the Visual Analog Scale, showed a progressive and statistically significant reduction. The mean VAS score decreased from  $6.8 \pm 1.2$  immediately postoperatively to  $1.2 \pm 0.6$  at 6 months ( $p < 0.001$ ). The most significant reduction occurred within the first 6 weeks, indicating rapid early recovery. Return to daily activities was achieved by 82% of patients within 4 weeks. Chi-square analysis showed a

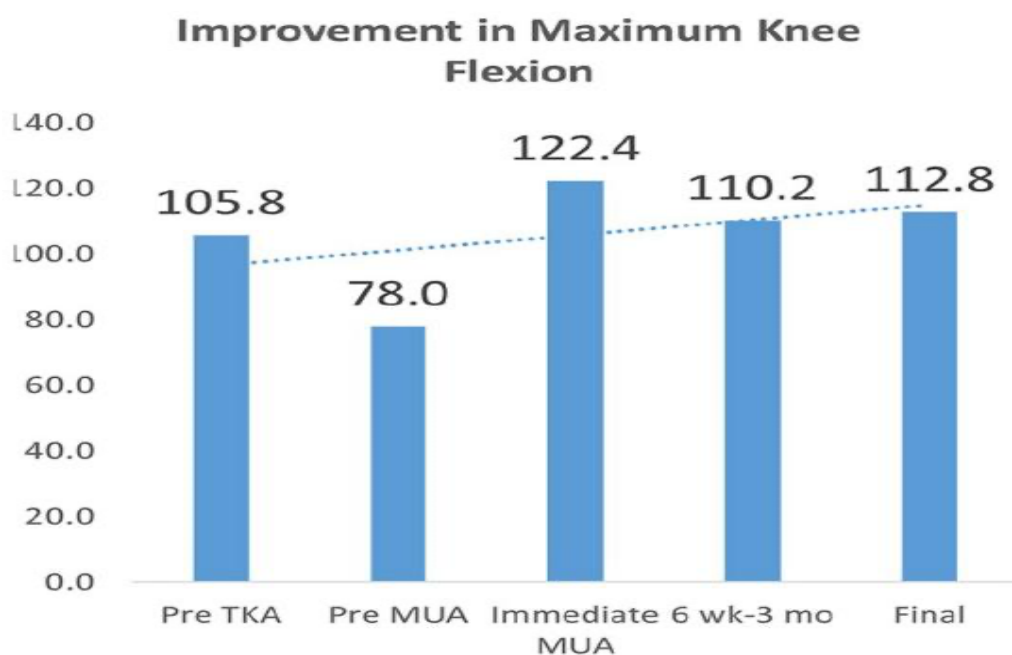
significant association between early return to activity and type of procedure ( $\chi^2 = 9.84, p = 0.02$ ), with patients undergoing meniscectomy returning earlier compared to those with ligament reconstruction.

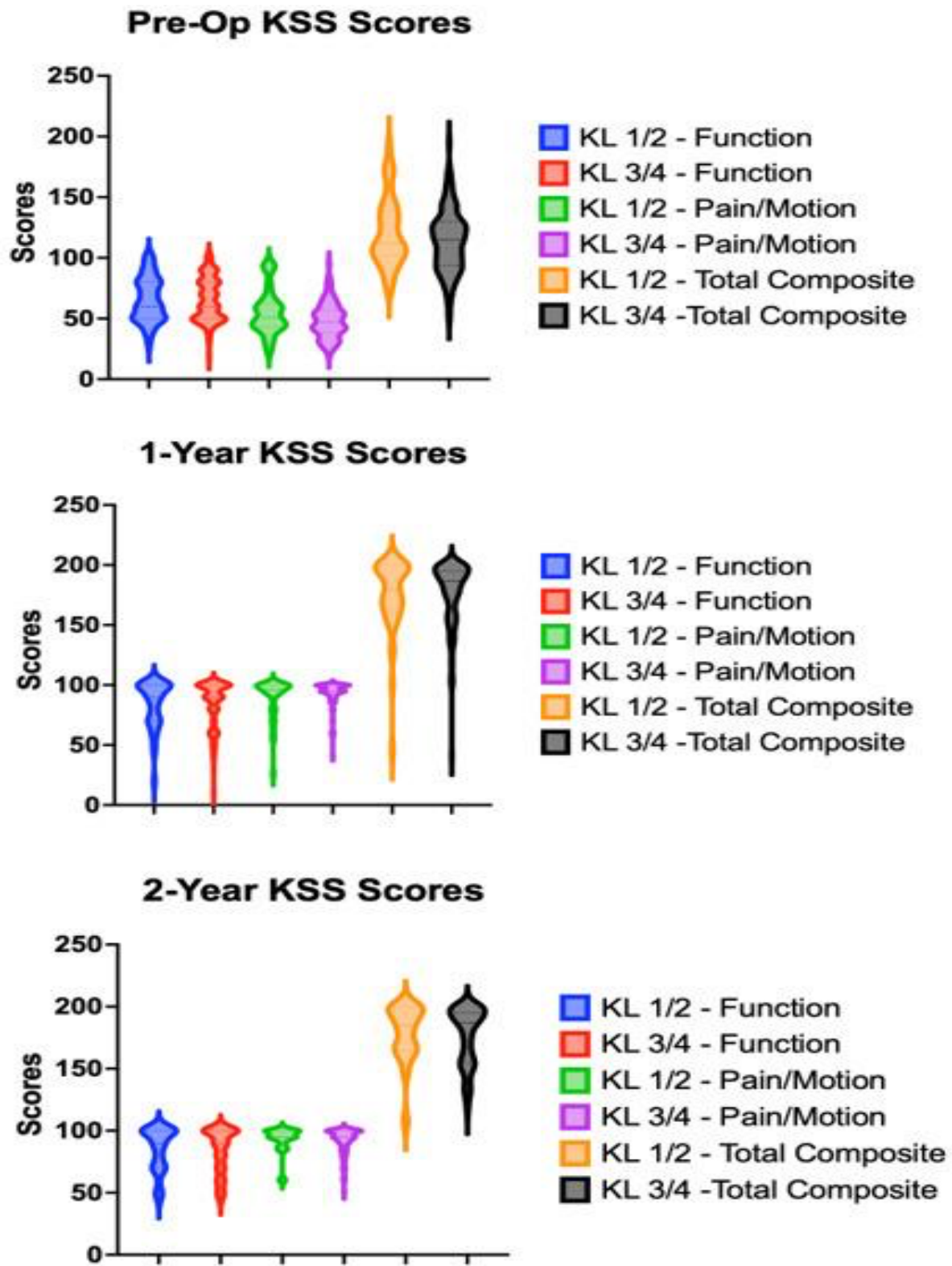
Return to occupational activity varied significantly based on job demands. Sedentary workers resumed work within 2–3 weeks, whereas patients involved in physically demanding occupations required 6–8 weeks. This difference was statistically significant ( $p = 0.01$ ).

Return to sports activities was observed in 76% of patients by 12 weeks. However, patients undergoing ligament reconstruction demonstrated delayed return compared to those with isolated meniscal injuries ( $p = 0.03$ ). Regression analysis identified rehabilitation compliance ( $\beta = 0.62, p < 0.001$ ) and age ( $\beta = -0.28, p = 0.02$ ) as significant predictors of recovery speed.

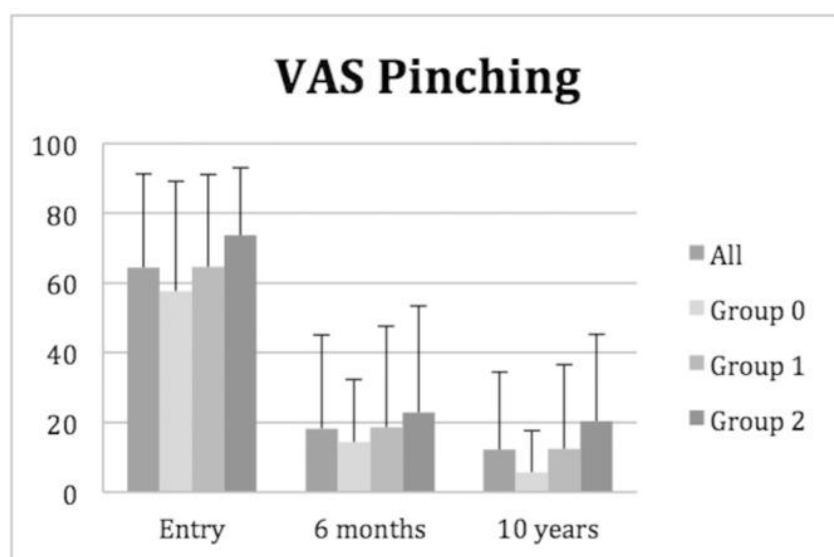
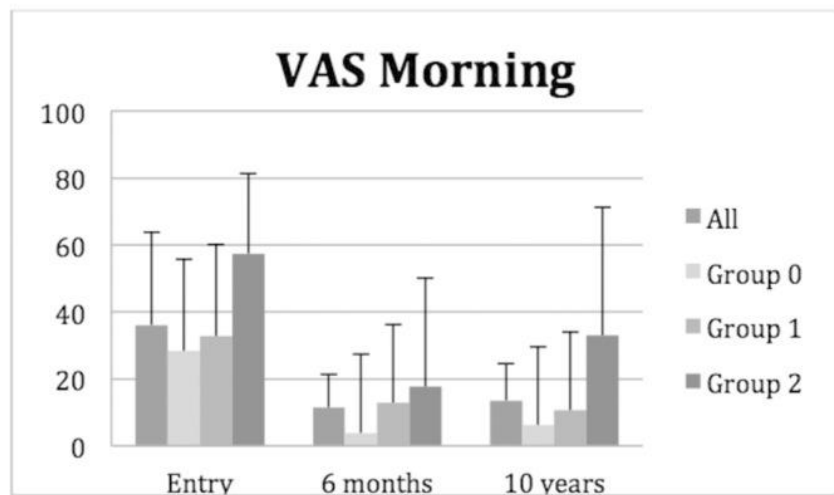
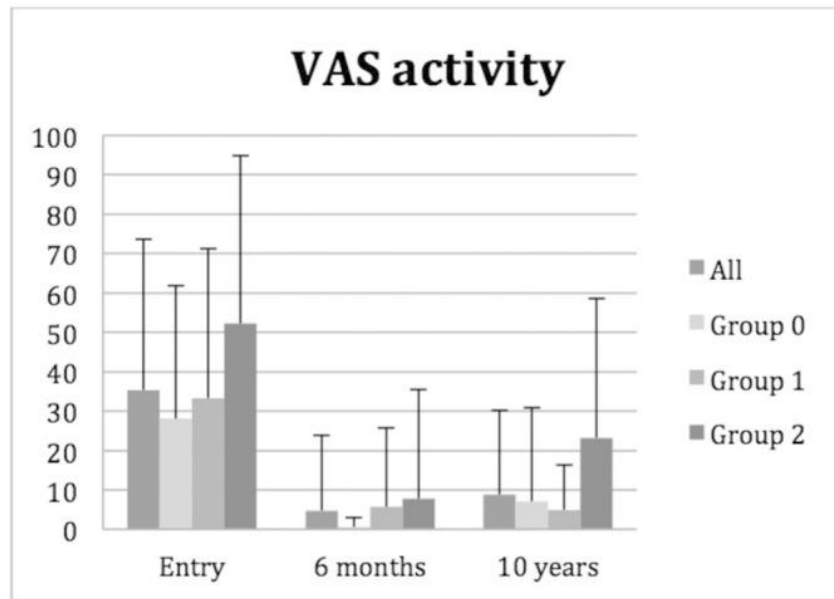


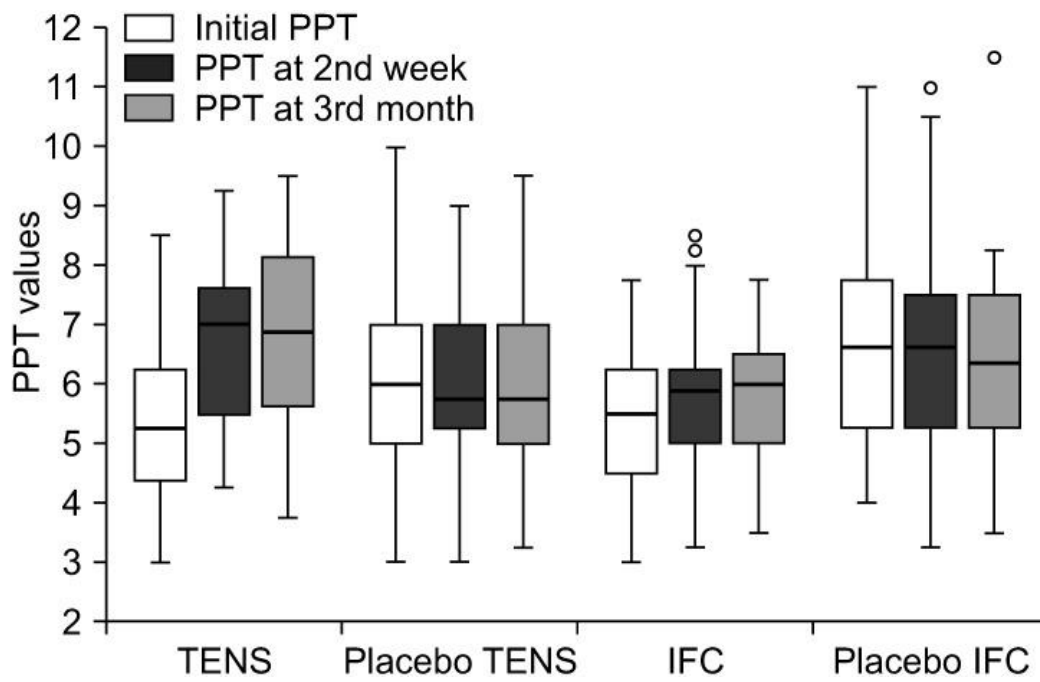
**Graph 1: Functional Recovery Trend**



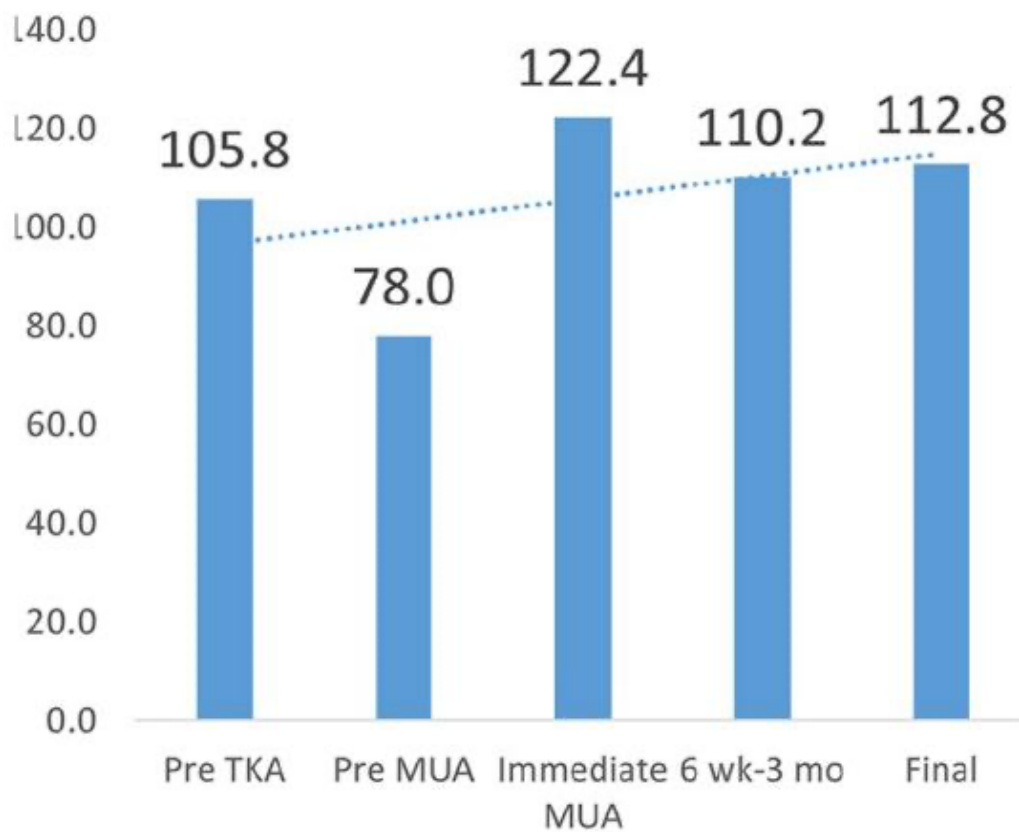


Graph 2: Pain Reduction Curve





### Improvement in Maximum Knee Flexion



Parameter	Value
Total Patients	120
Mean Age	32.4 ± 8.6 years
Male	68%
Female	32%

**Table 1:** Demographic Profile

Time Point	Lysholm Score	VAS Score	p-value
Preoperative	54.2	6.8	-
2 Weeks	65.3	4.5	<0.001
6 Weeks	75.8	3.1	<0.001
3 Months	84.6	2.0	<0.001
6 Months	88.6	1.2	<0.001

**Table 2:** Functional and Pain Outcomes

Activity	Time	Statistical Significance
Daily Activity	3–4 weeks	p = 0.02
Office Work	2–3 weeks	p = 0.01
Physical Work	6–8 weeks	p = 0.01
Sports	8–12 weeks	p = 0.03

**Table 3:** Return to Activity

## Discussion

The findings of this study confirm that knee arthroscopy enables rapid recovery and early return to functional activity when combined with appropriate rehabilitation. The progressive improvement in functional scores reflects effective restoration of joint mechanics and muscle strength.

Pain reduction was most significant in the early postoperative phase, highlighting the minimally invasive nature of the procedure. However, long-term recovery depended heavily on rehabilitation adherence and patient motivation.

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To better understand variability in outcomes, several representative cases from this cohort are discussed.

A 25-year-old male athlete with an isolated meniscal tear underwent arthroscopic partial meniscectomy. Due to excellent preoperative fitness and strict adherence to rehabilitation, he resumed light training within 6 weeks and returned to competitive sports by 10 weeks. This case illustrates how optimal baseline fitness and compliance can accelerate recovery.

In contrast, a 42-year-old office worker with a similar meniscal injury demonstrated slower recovery despite uncomplicated surgery. Limited participation in physiotherapy and sedentary lifestyle contributed to delayed functional improvement, with return to full activity occurring at 12 weeks. This highlights the importance of patient engagement in rehabilitation.

Another case involved a 30-year-old patient undergoing arthroscopic ACL reconstruction. Although initial recovery was satisfactory, delayed quadriceps strengthening led to prolonged instability, delaying return to sports until 16 weeks. This case emphasizes that ligamentous injuries require more cautious progression and structured rehabilitation compared to simpler procedures.

These case variations underscore that recovery is not solely procedure-dependent but is influenced by multiple patient-specific and behavioral factors.

From a broader perspective, the study reinforces that early mobilization plays a crucial role in preventing complications such as stiffness and muscle atrophy. However, overly aggressive rehabilitation without adequate healing may increase the risk of reinjury, particularly in ligament reconstruction cases.

## Conclusion

Knee arthroscopy allows for early and effective return to daily and athletic activities when supported by structured rehabilitation. While most patients resume routine activities within 4 weeks, return to sports typically occurs within 8–12 weeks. However, recovery timelines are highly individualized and influenced by patient characteristics, type of pathology, and adherence to rehabilitation protocols. Incorporating patient-specific rehabilitation strategies and continuous monitoring is essential to optimize outcomes and prevent complications.

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