

## ANALYSING THE INCIDENCE OF COMPLICATIONS ASSOCIATED WITH KNEE ARTHROSCOPY

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**Abstract:** Knee arthroscopy is a minimally invasive surgical technique for diagnosing and treating knee conditions. While generally safe, complications can occur, ranging from minor infections to severe nerve damage or septic arthritis. Understanding these complications is essential for optimal patient care. **Objective:** To explore the occurrence of complications related to knee arthroscopy. **Methods:** After the ethical approval from the institutional review board, this retrospective cohort study was conducted at JPMC Karachi from 01/09/23 to 29/02/24. Through the non-probability consecutive sampling, patients between ages 18 and 50, either gender and patients undergoing elective arthroscopy procedures were included in the present study. Detailed documentation of difficulties during surgery and recovery, such as infections, blood clots, nerve damage, and mechanical issues, is crucial for assessing the frequency and seriousness of negative outcomes. **Results:** Synovectomy (79%) followed by Meniscectomy 78% was the common arthroscopic procedure performed. The incidence of complications after the arthroscopic procedure in the present study was 23%. Septic arthritis (33%), followed by Neural, vascular, or ligament injury and superficial infections (20%) were the complications observed in the present study. **Conclusion:** Arthroscopic knee surgeries are minimally invasive, generally safe procedures with low complication rates. Within this series were 15 (2%) complications, with five occurrences (33%) explicitly involving septic arthritis.

**Keywords:** Arthroscopy, Knee, Complications, Infections

### Introduction

Knee arthroscopy has transformed the treatment of many knee conditions by delivering a minimally invasive method that allows for a precise diagnosis and treatment with minimal risk (1). This surgical procedure utilises an arthroscope and specialised instruments inserted through small incisions near the knee joint to visualise, diagnose, and treat conditions such as meniscal tears, ligament injuries, cartilage damage, and synovitis (2, 3). The growing popularity of knee arthroscopy is evident in its rising usage rates in recent decades. Comparative analyses of national surveys on ambulatory surgery have shown a notable increase in outpatient knee arthroscopy procedures in Pakistan, highlighting its increasing importance as a favoured method for managing knee conditions. This trend highlights the advantages associated with knee arthroscopy, including quicker recovery times, shorter hospital stays, and fewer complication rates than conventional open surgery (4).

Although knee arthroscopy has benefits, treatment is not without complications. Although most surgeries are uneventful, complications can arise, varying from minor inconveniences to severe adverse effects that may require further interventions or lead to long-term incapacity (5). Typical consequences of knee arthroscopy include infection, thromboembolic events (such as deep vein thrombosis and pulmonary embolism), neurovascular damage, and ongoing discomfort or stiffness (6, 7). Both patients and healthcare practitioners must have a thorough grasp of the frequency and characteristics of these issues. Clinicians can inform patients about the risks and advantages of knee arthroscopy, allow collaborative

decision-making, and implement interventions to reduce adverse events by studying the frequency of negative outcomes and identifying possible risk factors. This research aims to explore the occurrence of complications related to knee arthroscopy. We aim to improve patient outcomes in knee arthroscopy by combining research data and clinical expertise to increase awareness and enhance the quality of care for patients with knee issues, ultimately advancing the field of orthopaedic surgery.

### Methodology

After the ethical approval from the institutional review board, this retrospective cohort study was conducted at JPMC Karachi from 01/09/23 to 29/02/24. Through the non-probability, consecutive sampling of patients between 18 and 50, either gender and patients undergoing elective arthroscopy procedures were included in the present study. Patients who underwent concurrent knee surgeries in addition to arthroscopy during the study period, including open knee procedures, were excluded from the present study. Age, gender, body mass index (BMI), and comorbidities of patients were carefully recorded to describe the study population. Details such as the specific arthroscopic procedure and additional procedures performed were documented to describe the extent and characteristics of the knee arthroscopy procedure. Detailed documentation of difficulties during surgery and recovery, such as infections, blood clots, nerve damage, and mechanical issues, is crucial for assessing the frequency and seriousness of adverse outcomes. SPSS version 21 was used to analyse the data. Descriptive statistics were used to

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summarise patient demographics, surgical characteristics, and the incidence of complications. The incidence rate of complications was calculated as the number of events divided by the total number of knee arthroscopies performed during the study period. Subgroup analyses were conducted to explore potential associations between patient characteristics and the risk of complications. Statistical tests such as chi-square were employed to identify significant predictors of adverse outcomes.

**Results**

Five hundred sixty-five patients fulfilling the inclusion criteria were included in the present study. Table 1 shows the clinical and demographic parameters of the study participants. The mean age of the recruited participants was 34.56±6.54 years, with the majority (61%) were less than 35 years old. Most of the participants in the present study were male (62%). The mean BMI of the recruited participants was 23.45±3.2 Kg/m<sup>2</sup>, with the majority (59%) having a BMI of less than 25 Kg/m<sup>2</sup>. Synovectomy (79%) followed by Meniscectomy 78% was the standard arthroscopic procedure. The incidence of complications after the arthroscopic procedure in the present study was 23%. Septic arthritis (33%), followed by Neural, vascular, or ligament injury and superficial infections (20%), were the complications observed in the present study (Table 2).

**Table 2: Study participant's characteristics**

Parameters	Frequency (%) (n=565)
<b>Age Groups</b>	34.56±6.54
≤35 years	342 (61%)
>35 years	223(39%)
<b>Gender</b>	
Male	353 (62%)
Female	212 (37%)
<b>BMI</b>	23.45±3.2
≤25Kg/m <sup>2</sup>	338 (59%)
>25Kg/m <sup>2</sup>	227 (41%)
<b>Types of arthroscopic procedure</b>	
Meniscectomy	445 (78%)
Meniscal suture repair	226 (40%)
Anterior cruciate ligament reconstruction	334 (59%)
Posterior cruciate ligament reconstruction	100 (17%)
Synovectomy	447 (79%)
<b>Complication incidence</b>	15 (2%)

**Table 2: Types of complications**

Complication	Frequency (%) (n=15)	Reoperation
Intra-articular instrument breakage	2 (13%)	–
Meniscal injury	2(13%)	–
Septic arthritis	5 (33%)	2
Superficial infection	3 (20%)	–
Symptomatic DVT or PE	1 (6%)	–
Neural, vascular, or ligament injury	3 (20%)	1
Complex regional pain syndrome	–	–

Table 3 shows the stratification of complications' occurrence according to the patient's characteristics, i.e., age, gender, and BMI.

**Table 3: Stratification of complications according to age, gender, and BMI**

Parameters	Complications		P value
	Yes	No	
<b>Age groups</b>			0.607
≤35 years	9 (3%)	333 (97%)	
>35 years	6 (2%)	217 (98%)	
<b>Gender</b>			0.55
Male	13 (3%)	340 (97%)	
Female	2 (0.9%)	210 (99%)	
<b>BMI</b>			0.29
≤25Kg/m <sup>2</sup>	7 (2%)	331 (98%)	
>25Kg/m <sup>2</sup>	8 (3)	219 (97%)	

**Discussion**

One of the most popular procedures carried out by orthopaedic surgeons is knee arthroscopy. Patients suffering from meniscal injury or acute meniscal pathology due to osteoarthritis may find relief with arthroscopy. However, this treatment may not be necessary for all knee pathologies (8). In cases where mechanical impediments to motion are present, when there are symptomatic loose bodies, when there is synovial pathology, and when septic arthritis is known or suspected, knee arthroscopy has also been found to be useful (9). Cartilage restoration, ligament regeneration, and fracture reduction can benefit significantly from knee arthroscopy (10).

In the present study, the incidence of complications following the knee arthroscopy was 2%. Jameson et al. analysed 30-day reoperation and readmission rates from 301,701 knee arthroscopies conducted from 2005-2010; the study reported a 0.64% 30-day readmission rate, 0.26% 30-day wound complication rate, and 0.40% 30-day reoperation rate (11). Salzler et al. found 4,305 problems in 92,565 knee arthroscopic surgeries from the American Board of Orthopaedic Surgery database, resulting in an overall complication rate of 4.7% reported by candidates. The researchers determined that knee arthroscopy carries risks, and patients should be informed about potential problems (12). Martin et al. examined 12,271 instances of planned knee arthroscopy, finding an overall complication rate of 1.6%. In their series, pulmonary embolism occurred in 0.05% and fatality in 0.008% of arthroscopic surgeries (13). Jameson et al. found that deep vein thrombosis occurred in 0.12% of arthroscopic procedures, pulmonary embolism in 0.08%, and death in 0.02% (11). A recent study in the United States found that the incidence of pulmonary embolism after knee arthroscopies was 2.8 per 10,000 patients (14). Martin et al. determined that black race, previous surgery within 30 days, surgery lasting over 1.5 hours, and age between 40 and 65 years are risk factors for complications after knee arthroscopy (13). Bohensky et al. found that risk factors for adverse outcomes following knee arthroscopy were chronic renal disease, myocardial infarction, cerebrovascular accident, and malignancy (15). The present study found no significant association between patients' characteristics and complications after the knee arthroscopy.

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## Conclusion

The current findings indicated a complication risk of 2% after arthroscopic knee surgeries at our institution. Arthroscopic knee surgery is minimally invasive and generally safe. However, there have been cases of symptomatic thrombosis or mortality in individuals with risk factors. Recognising the potential for severe consequences in arthroscopic knee surgeries is essential. Septic arthritis was a significant local consequence in two cases, both of which were effectively managed with early arthroscopic washout, debridement, and antibiotics. Septic arthritis can be successfully treated without long-term effects with prompt identification and timely administration of the correct medicine. Hence, meticulous postoperative monitoring is crucial.

## Declarations

### Data Availability statement

All data generated or analyzed during the study are included in the manuscript.

### Ethics approval and consent to participate

Approved by the department concerned. (ERCJPMC-2021-10-215)

### Consent for publication

Approved

### Funding

Not applicable

## Conflict of interest

The authors declared an absence of conflict of interest.

## Author Contribution

### JAVED AHMED (Registrar)

*Study Design, Review of Literature.*

*Conception of Study, Development of Research Methodology Design, Study Design, manuscript Review, and final approval of manuscript.*

### ABDUL GHAFAR (Registrar)

*Manuscript revisions, critical input.*

*Coordination of collaborative efforts.*

### M. UMAR FAROOQUE (Registrar)

*Conception of Study, Final approval of manuscript.*

*Data acquisition, analysis.*

### KIFAYATULLAH (PG Trainee)

*Coordination of collaborative efforts.*

*Manuscript drafting.*

### SADAM HUSSAIN (Registrar)

*Coordination of collaborative efforts.*

### KASHIF ANWAR (Registrar)

*Data entry and Data analysis, drafting article.*

*Data acquisition, analysis.*

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