Impact of Prior Extensor Mechanism Injury or Patella Fracture on Subsequent Total Knee Arthroplasty Outcomes

Chloe Cecile Fong, Braden Vincent Saba[1], Olivia Schaffer, Ran Schwarzkopf, Joshua Craig Rozell, Daniel Sherwood
[1]Adult Reconstruction

INTRODUCTION: Prior extensor mechanism and patella injury pose technical challenges related to exposure and patellar fixation during subsequent total knee arthroplasty (TKA). To date, outcomes in these patients have not been well-described. This study sought to characterize the impact of prior extensor mechanism injury or patella fracture on subsequent TKA outcomes compared to patients without prior pathology.

METHODS: We retrospectively reviewed 25,652 TKAs performed at a single urban academic center (June 2011–March 2025). Inclusion criteria included a history of prior extensor mechanism injury or patella fracture prior to TKA. Controls were primary unilateral TKAs for osteoarthritis without a history of an extensor mechanism injury. Exclusion criteria were age <18, non-OA indications, unicompartmental knee arthroplasty, revision procedures, or conversion TKA. Demographics, injury characteristics, and outcomes were analyzed using t-tests and chi-square tests.

RESULTS: Forty-four patients (0.17%) had prior extensor mechanism injury or patella fracture an average of 3.1 years before TKA. These patients were demographically similar to controls, except for higher BMI (32.4vs.28.6,P<0.001). Ten patients had prior extensor mechanism injuries and all were managed operatively. Thirty-four patella fractures were identified; six were displaced, seven were comminuted, and the remaining twenty-one were nondisplaced, transverse or vertically oriented, or were unknown. Six of the 34 patella fractures were managed surgically. Prior to TKA, seven patients with extensor mechanism injuries and 14 with patella fractures remained symptomatic. All-cause revision was higher in patients with prior injury (11.4vs3.2%,P=0.018), driven by a higher septic revision rate (4.5vs0.7%,P=0.041); aseptic revision rates were similar. Of the 16 patients with prior pathology who were treated operatively, three (18.6%) required reoperation post-TKA (one due to stiffness and two due to infection); of the 28 patients managed nonoperatively, two (11.1%) required reoperation post-TKA (both due to stiffness).

DISCUSSION AND CONCLUSION: Patients with extensor mechanism injury or patella fracture prior to TKA represent a clinically and surgically complex cohort compared to patients without prior injury. This study found that patients with prior extensor mechanism or patella injuries have increased rates of revision surgery, particularly for septic causes. Further investigation may clarify additional clinical considerations unique to this patient cohort.

Table 2 – Extensor Mechanism Pathology/Patella Fracture Descriptive Characteristics

	Extensor Mechanism Pathology (n=10)	Patella Fracture (n=34)
Tendon Rupture, n (%)		
Patellar Tendon	3 (30)	-
Quadriceps Tendon	7 (70)	
Patellar Fracture Displacement, n (%)		
Displaced	-	6 (17.6)
Non-displaced	-	24 (70.6)
Unknown	-	4 (11.8)
Patella Fracture Orientation, n (%)		
Comminuted	-	7 (20.6)
Transverse	-	9 (26.5)
Vertical	-	14 (41.2)
Unknown	-	4 (11.8)
Operative Management, n (%)	10 (100)	6 (17.6)
ORIF	-	6 (100)
Repair	7 (70)	-
Reconstruction	3 (30)	-
Secondary Reoperation for Extensor Mechanism/Patella Injury	4 (40)	5 (14.7)
Removal of hardware	-	4 (80)
Synovectomy	-	1 (20)
Revision reconstruction/repair	3 (75)	-
I&D	1 (25)	-
Persistent Residual Symptoms after Extensor Mechanism/Patella Injury Management,* n (%)	7 (70)	14 (41.2)
Pain	4 (57.1)	14 (100)
Instability	3 (42.9)	-
Patella Resurfacing during TKA	6 (60)	25 (73.5)
Secondary Reoperation for TKA	1 (10)	4 (11.8)
I&D	-	2 (50)
MUA	1 (100)	2 (50)
Persistent Residual Symptoms after TKA Management,** n (%)	5 (50)	8 (23.5)
Pain	5 (100)	7 (87.5)

Table 3. Clinical Outcomes

	Prior Extensor Mechanism Pathology/Patella Fracture (n=44)	Controls (n=25,608)	*P*-value
Procedure Duration in Minutes, mean [SD] (min-max)	109.2 [28.8] (59-216)	102.8 [32.7] (42-363)	0.196
Length of Stay in Hours, mean [SD] (min-max)	47.2 [28.5] (8-126)	55.3 [40.5] (4-1207)	0.184
Discharge Disposition, n (%)			0.075
Home	43 (97.7)	21,932 (85.8)	
Skilled Nursing Facility	1 (2.3)	2,719 (10.6)	
Acute Rehab Facility	0 (0.0)	913 (3.6)	
90-Day Readmissions, n (%)	0 (0.0)	732 (2.9)	0.262
All-Cause Revision, n (%)	5 (11.4)	818 (3.2)	**0.018**
Aseptic	3 (6.8)	643 (2.5)	0.127
Instability	0 (0.0)	92 (0.4)	
Loosening	0 (0.0)	205 (0.8)	
Refractory Pain	0 (0.0)	38 (0.1)	
Mechanical Failure	0 (0.0)	81 (0.3)	
Periprosthetic Fracture	0 (0.0)	24 (0.1)	
Extensor Mechanism Disruption	0 (0.0)	17 (0.1)	
Stiffness	3 (6.8)	47 (0.2)	
Other	0 (0.0)	139 (0.5)	
Septic	2 (4.5)	175 (0.7)	**0.041**

Table 1. Demographics

Demographic variables	Prior Extensor Mechanism Pathology/Patella Fracture (n=44)	Controls (n=25,608)	*P*-value
Age, mean [SD] (min-max)	67.7 [10.4] (48-87)	66.9 [9.5] (18-99)	0.565
Race, n (%)			0.132
White	31 (70.5)	14,398 (56.3)	
Black	6 (13.6)	4,835 (18.9)	
Asian	3 (6.8)	1,105 (4.3)	
Other/Unknown	4 (9.1)	5,226 (20.4)	
Smoking Status n (%)			0.851
Current	2 (4.5)	1,310 (5.1)	
Former	17 (38.6)	8,846 (34.6)	
Never	25 (56.8)	15,408 (60.3)	
Sex, n (%)			0.107
Female	35 (79.5)	17,327 (67.8)	
Male	9 (20.5)	8,237 (32.2)	
ASA, n (%)			0.855
1	1 (2.3)	468 (1.8)	
2	26 (59.1)	14,220 (55.6)	
3	17 (38.6)	10,551 (41.3)	
4	0 (0.0)	325 (1.3)	
BMI, mean [SD] (min-max)	28.6 [4.4] (20-39)	32.4 [6.3] (14-74)	**<0.001**
CCI, mean [SD] (min-max)	4.1 [2.6] (1-11)	3.5 [2.2] (0-19)	0.075
Anesthesia Type, n (%)			0.140
General	8 (18.2)	2,787 (10.9)	
Regional	36 (81.8)	22,777 (89.1)	

BMI: Body Mass Index; CCI: Charlson Comorbidity Index; ASA: American Society of Anesthesiologists