Short-term Complications After Medial Quadriceps Tendon-Femoral Ligament Reconstruction for Patellar Instability

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INTRODUCTION: Medial quadriceps tendon-femoral ligament (MQTFL) reconstruction has been described as an alternative to medial patellofemoral ligament (MPFL) reconstruction in the treatment of patellar instability. The surgical technique has been reported to avoid the risk of iatrogenic patella fracture because it does not require drilling into the patella and instead attaches a graft through a slot in the distal quadriceps tendon. However, the complications associated with this newer technique have not been reported. The purpose of this study was to report on the complications that occur after MQTFL reconstruction in patients with patellar instability.

METHODS: Patients who underwent MQTFL reconstruction for the treatment of patellar instability by two surgeons at two tertiary care hospitals were identified from September 2020 to May 2023. All patients had a clinical history of chronic patellar instability. Postoperative complications and reoperations were recorded with 90-day minimum follow-up and categorized based on Healey et al.'s criteria for minor and major complications, with specific attention to those avoidable based on surgical technique. Clinical data including age, sex, BMI, American Society of Anesthesiologists (ASA) score, and history of ligamentous laxity, as well as surgical data including concurrent procedures, graft fixation method, and graft type were recorded and assessed for their relationships to the reported complications. Patients who received concomitant tibial tubercle osteotomy (TTO) were excluded.

RESULTS SECTION: The studied cohort included 64 patients, of which 48 were female (75%) with a mean age of 21.5 ± 8.3 years. 7 patients (10.9%) were revision surgeries. All patients had a tenodesis anchor at the distal adductor tubercle on the femur. 8 patients (12.5%) experienced a complication after surgery, with 1 patient (1.6%) undergoing reoperation. The average time from surgery to complication was 6.4 ± 7.7 months after surgery. Complications included pain without preceding trauma (2 patients, 3.1%), trauma to surgical site (2 patients, 3.1%), painless bursitis (1 patient, 1.6%), graft tear resulting in instability (1 patient, 1.6%), graft tear not resulting in instability (1 patient, 1.6%), and suture abscess (1 patient, 1.6%). Univariate and multivariate analysis did not indicate patient age, sex, BMI, ASA score, ligamentous laxity, revision procedure, and type of allograft as risk factors for complications.

DISCUSSION: This study indicates that isolated MQTFL reconstruction is a relatively safe procedure, with a lower risk of complications like iatrogenic fracture and medial over-tensioning compared to MPFL reconstruction. No cases of iatrogenic fracture were observed, which contrasts with the risk associated with MPFL reconstruction. The reoperation rate was relatively low (1.6%), indicating that MQTFL reconstruction is effective in reinforcing medial patellar constraint. One patient required a revision TTO due to chondral overload and may have benefitted from a concomitant TTO at the time of graft reconstruction. A better understanding of anatomical factors is needed to decide when a TTO should be performed.

One limitation is a relatively small sample size, which may limit the power of a multivariate regression analysis. Our patient cohort was predominantly young and healthy, which could impact generalizability, but reflects the typical patellar instability patient. Finally, complications may have been underreported if patients sought treatment outside the healthcare system where the study was conducted. Further studies are needed to understand long-term outcomes for MQTFL reconstruction.

SIGNIFICANCE/CLINICAL RELEVANCE: We report the largest series thus far on complications that occur after MQTFL reconstruction. MQTFL reconstruction offers safe and effective patellar stabilization without risk of iatrogenic fracture, as compared to the known risk in MPFL reconstruction.

IMAGES AND TABLES:

Table 1. Patient demographics and surgical history

	MQTFL (64) (%)
Age	21.5 ± 8.3 years
Sex (F)	48 (75%)
BMI	26.3 ± 6.6
ASA Score	
1	27 (42.1%)
2	33 (51.6%)
3	4 (6.3%)
Ligamentous laxity	16 (25%)
Follow-up time from surgery to last patellar exam	5.4 ± 4.5 months
Revision surgery after prior stabilizing procedure	7 (10.9%)
Allograft type	
Posterior tibialis	43 (67.2%)
Semitendinosus gracilis	9 (14.1%)
Anterior tibialis	8 (12.5%)
Tibialis flexigraft	3 (4.7%)
Semitendinosus	1 (1.6%)

BMI – Body Mass Index. ASA- American Society of Anesthesiologists.

Table 2. Postoperative complications and reoperations

	Isolated MQTFL (64)
Any postoperative complication	8 (12.5%)
Major	1 (1.6%)
Graft tear resulting in instability (Avoidable)	1 (1.6%)
Minor	7 (10.9%)
Trauma to graft site	2 (3.1%)
Pain unrelated to trauma	2 (3.1%)
Bursitis	1 (1.6%)
Graft tear not resulting in instability	1 (1.6%)
Suture abscess	1 (1.6%)
Time between surgery and complication	6.4 ± 7.7 months
Reoperations	1 (1.6%)
Tibial tubercle osteotomy	1 (1.6%)