Patellar Tunnels for Patellar-Sided Graft Fixation During MPFL Reconstruction are a Safe and Reliable Alternative: A Study of Over 600 Knees

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Introduction:

Limited prior study has suggested decreased rates of recurrent patellar instability when using two smaller (3.2 mm), short, oblique patellar tunnels with looped graft for patellar sided graft fixation during medial patellofemoral ligament reconstruction (MPFL-R) in comparison to the use of two suture anchors. Additionally, these smaller tunnels don't appear to be associated with the same risk of patellar fracture observed when using larger (4.5 mm), fully-transpatellar tunnels. The purpose of this study was to further compare clinical outcomes and complications in larger series between the use of dual patellar suture anchors and dual, small (3.2 mm), short, oblique bone tunnels for patellar-sided graft fixation during MPFL-R.

Materials & Methods:

Retrospective chart review identified all patients at a single academic institution who underwent primary MPFL-R between March 2010 and December 2022. Operative notes, postoperative clinical follow-up notes, and radiographs were used ascertain laterality, graft type, surgical technique and instrumentation utilized, and concomitant procedures performed, as well as the incidence of recurrent lateral patellar instability, revision MPFL-R, and patellar fracture.

Results:

A total of 540 knees were included for final analysis **[Table 1]**. Patellar-sided graft fixation was achieved with dual, small (3.2 mm), short, oblique bone tunnels with looped graft in 343 knees (53.6%) and dual suture anchors in 297 knees (46.4%). The small, oblique tunnels and suture anchor techniques both yielded a low incidence of patellar fracture, with rates of 1 in 343 knees (0.3%) and 0%, respectively. No significant difference in rates of patella fracture existed between cohorts (p = 1.0) **[Table 2]**. There was a significantly decreased rate of recurrent patellar instability events in patients in whom patellar-sided graft fixation was achieved with dual, small (3.2 mm), short, oblique bone tunnels (n = 7, 2.0%) compared to dual suture anchors (n = 15, 5.1%; p = 0.037). There was no significant difference in rates of revision MPFL-R between groups (dual small (3.2 mm), short, oblique patellar tunnels: n = 5, 1.5%; dual suture anchors: n = 8, 2.7%; p = 0.269).

Conclusion:

The use of two small (3.2 mm), short, oblique patellar tunnels with looped graft is a safe and efficacious means of achieving patellar-sided graft fixation during MPFL-R, while also conferring material cost savings in comparison to the use of two suture anchors.

Tables:

| Demographics | | | | |
|---|--------------------|--|--|--|
| Age | 23.05 years ± 9.30 | | | |
| Sex (female, %) | 414 (64.7 %) | | | |
| Laterality (left, %) | 225 (35.2 %) | | | |
| Concomitant Tibial Tubercle Osteotomies | | | | |
| Anteromedializing (n, %) | 210 (70.5 %) | | | |
| Distalizing (n, %) | 24 (8.0 %) | | | |
| Both (n, %) | 64 (21.5 %) | | | |
| Total (n) | 298 | | | |
| Fixation | | | | |
| Suture anchors (n, %) | 297 (46.4 %) | | | |
| Oblique tunnels (n, %) | 343 (53.6 %) | | | |
| Graft | | | | |
| Gracilis (n, %) | 446 (69.7 %) | | | |
| Semitendinosus (n, %) | 193 (30.2 %) | | | |
| Unknown (n, %) | 1 (0.2%) | | | |
| Autograft (n, %) | 452 (70.6 %) | | | |
| Allograft (n, %) | 184 (28.7 %) | | | |
| Missing (n, %) | 1 (0.2 %) | | | |
| Auto/allo hybrid (n, %) | 3 (0.5 %) | | | |

Table 1. Patient demographics and surgical characteristics of included subjects in the final analysis.

| | Small, Oblique Patellar Tunnels (n, %) | Suture Anchors (n,%) | Odds Ratio (95% CI) | p value |
|--|--|----------------------------|------------------------|---------|
| Patella Fracture | 1 (0.3%) | 0 | N/A | 1.00 |
| Revision MPFL Reconstruction | 5 (1.5%) | 8 (2.7%) | 1.871 | 0.269 |
| Recurrent Patellar Instability (Subluxation/Dislocation) | 7 (2.0%) | 15 (5.1%) | 2.553 | 0.037* |
| Total | 343 | 297 | | |

Table 2. A comparison of rates of patella fracture, recurrent patellar instability, and revision medial patellofemoral ligament reconstruction between cohorts of patients, dependent upon the type of patellar-sided graft fixation utilized.