

Patellar Reconstruction with a Trabecular Metal-Backed Component and Screw Fixation: A Case Series.

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INTRODUCTION: Limited patellar bone stock in revision total knee arthroplasty (TKA) may compromise patellar component fixation leading to early loosening or extensor mechanism deficits. Trabecular metal (TM)-backed components have been proposed to obtain long-term component fixation and restore patellar anatomy. However, current techniques (i.e., suture fixation) have limitations and/or elevated failure rates. This preliminary series aims to evaluate our experience with TM-backed patellar components affixed with a novel method of mini-fragment screw fixation in the setting of revision TKA and limited patellar bone stock (Figures 1 and 2).

METHODS: A retrospective chart review, including relevant radiographic evaluation, was performed for all TM-backed patellae affixed with mini-fragment screws and implanted by the senior author from March 2020 to May 2022. Baseline patient characteristics and TM-backed patellae survivorship and radiologic fixation were evaluated. Surgical technique included patella preparation with corresponding reamers as per standard protocol of TM-backed implant. TM-backed patellae were secured with mini-fragment screws (1.5 mm screws, 1.1mm drill bit) instead of suture fixation. Minimum numbers of screws used for fixation was 6 (range, 6 to 12 screws) (Figure 3).

RESULTS: Twenty-two TM-backed patellae were implanted in 21 patients. Unfortunately, one patient died within a few months after implantation (no patellar component failure). The average follow-up of the remaining 21 cases was 3 years (range, 1 to 4 years). At final follow-up, and despite a high prevalence of history of periprosthetic joint infection (PJI) (82%), previous revisions (mean, 3.2), and limited preoperative patellar thickness (mean, 7.6 mm), all components were radiographically stable and retained with exception of one component that was removed due to uncontrolled infection and subsequent amputation (Table 1). Nine knees required one or more subsequent operative intervention(s) for several reasons, including PJI (n=6), femoral component loosening (n=2), supracondylar fracture (n=1), chronic patellar tendon rupture (n=1), lateral patellar subluxation (n=1), and medial parapatellar arthrotomy dehiscence (n=1). Nevertheless, TM-backed patellar components were deemed well-fixed intraoperatively and were retained.

DISCUSSION AND CONCLUSION: Our data suggests that TM-backed patellar components affixed with mini-fragment screws have excellent short- to mid-term survivorship in the setting of revision TKA and limited patellar bone stock. Further investigation is warranted to ascertain long-term outcomes.

Figure 1. Preoperative radiographs.



Figure 2. Postoperative radiographs.

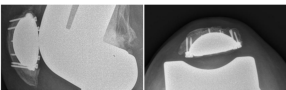


Figure 3. TM-backed patella screw fixation.



Table 1. Demographics and baseline patient characteristics.

Variable	Level	Total (N=22)
Age, mean in years (range)		67.6 (51 - 81)
Sex, N (%)	Male	14 (63.6%)
	Female	8 (36.4%)
Race, N (%)	White	21 (95.5%)
	Black	1 (4.5%)
Hispanic Ethnicity, N (%)	No	20 (90.9%)
	Yes	2 (9.1%)
ASA, N (%)	1	0 (0%)
	2	5 (22.7%)
	3	17 (77.3%)
	4	0 (0%)
BMI, mean in Kg/m ² (range)		29.3 (18.3 - 44.3)
History of PJI prior to TM-backed patella implantation, N (%)	No	4 (18.2%)
	Yes	18 (81.8%)
Preoperative patellar thickness, mean in mm (range)		7.6 (4.2 - 15)
	0	1 (4.5%)
	1	3 (13.6%)
	2	6 (27.3%)
	3	6 (27.3%)
	4 or more	6 (27.3%)
Length of follow-up, mean in days (range)*		965 (113 - 1,425)

ASA= American Society of Anesthesiologists status classification system; BMI= Body mass index; PJI= periprosthetic joint infection. * 21 cases in 20 surviving patients.