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Partial Lateral Patellar Facetectomy as an Alternative to Lateral Release in Total Knee Arthroplasty (TKA)

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ABSTRACT

This study presents the selective use of partial patellar lateral facetectomy for maltracking during primary TKA, as an alternative to lateral release. Twenty three partial facetectomies were performed out of 191 TKAs (12%). Balanced tracking was achieved in 22 knees. At follow-up 2 patients had persistent anterior knee pain. Mean Knee Society score (KSS) was 94 and mean functional KSS was 86. Mean patellar score was 28. Patellar tilt angles were within 2 degrees in all but one knee. Patellar translation was within 2 mm in all cases. No complications were recorded. A control group of 46 matched patients had similar functional and radiographic results. If tracking is not satisfactory at the conclusion of TKA, our method of choice would be partial lateral facetectomy.

Patellofemoral pain and instability remain the common postoperative complications after TKA and 8–12% of early revisions are performed because of patellofemoral problems [1–3]. It was demonstrated that even a mild degree of patellar maltracking may be associated with patellar pain and higher degrees may lead to actual instability [4–6]. The best means of dealing with patellar maltracking is by prevention, including proper coronal and rotational alignment of the implants. Nevertheless, between 5 and 52% of cases need surgical management of some extent of maltracking [4,7–14]. When the patella is resurfaced, medial placement of the button may improve tracking. In extreme cases, distal realignment would be necessary. However, the "workhorse" of patellar maltracking management is still the lateral retinacular release. Lateral release may injure the lateral blood supply of the patella, with the medial supply already injured during arthrotomy. It may also leave the joint open. Complications associated with lateral release include avascular necrosis, anterior knee pain, wound healing complications, patellar fractures and patellar loosening. Lateral release was also associated with longer stay in hospital, higher transfusion rates and poorer range of motion [4,10,15].

Lateral patellar decompression has been sporadically described in the context of the management of patellofemoral arthrosis, with the purpose of limiting pain generated by the contact of the lateral patellar facet and the lateral femoral trochlea [16–18]. During patellar resurfacing, decompression or beveling of the lateral remainder of the patella may be performed in order to prevent pain.

We present our experience with a technique of managing unresurfaced patellar maltracking during TKA as an alternative to lateral release. Partial lateral facetectomy of the patella achieves bony decompression and effective retinacular lengthening while sparing the vascular supply of the patella. The objectives of this study were to examine the efficiency of the technique in achieving good tracking, the short term functional outcomes and the rate of complications related to the technique.

Patients and Methods

191 primary total knee arthroplasties were performed in our institution during 2010 and 2011. Revisions and difficult primaries in which constrained implants were used were not included. The study group included all patients in which at the conclusion of surgery patellar tracking was not satisfactory. Twenty three partial facetectomies (12%) were performed in 22 patients (16 females and 6 males). Mean age was 70 (range, 50–83). Twenty one knees had varus or neutral alignment preoperatively and 2 had valgus knees. Indication for surgery was osteoarthritis in 21 patients and rheumatoid arthritis in a single patient. One patient died a few months after surgery and one patient had a stroke leaving her in a vegetative state. One patient underwent a later patellar resurfacing. All other 19 patients

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(20 knees) were contacted and showed up at our clinic for clinical and radiographic follow-up. Mean follow-up was 33 months (range, 17–45).

Forty six matched patients were identified from the 191 patients to act as a control group. The matched group had undergone primary TKA with no need to correct tracking. Two control patients were blindly and individually matched to a study patient on the basis of gender and age. Mean follow-up was 38 months (range, 30–53). Seven patients were lost to follow-up and one patient underwent a revision due to unresolving pain 2 years postoperatively. Details of the two groups are summarized in Table 1.

The study was approved by the institutional ethics committee, and all patients were consented before evaluation. The primary endpoint of the study was the intraoperative correction of maltracking, obviating the need for lateral release, as judged by the surgeon using the "no thumb" technique. Intraoperative maltracking was classified as tilting, subluxation or dislocation [5,11]. Functional outcome was evaluated using the Knee Society Score and the Feller patellar score [19,20]. Radiographic evaluation included routine standing AP and lateral views of the knee and a 30° skyline view (Fig. 1) [21]. Tracking was assessed by measuring patellar tilt and patellar translation on the skyline view [22,23]. Patellar maltracking was defined as patellar tilt of >5° or displacement >5 mm [11]. Complications were recorded.

Surgical Technique

All surgeries were performed by 3 of the authors (DH, AE, DL) through a medial parapatellar approach using posterior stabilized Nexgen mobile bearing implants (Zimmer, Warsaw, Indiana). We do not resurface the patella. Tourniquets were used in all cases. The femur was rotated to be parallel to the interepicodylar axis as verified by Whiteside's AP axis. The tibia was rotated toward the medial third of the tibial tuberosity. Patellar tracking was assessed with the trial components in and further adjustment of tibial rotation was performed as required. After cementation of the implants, tourniquet release, resection of patellar osteophytes and determination of appropriate polyethylene thickness, patellar tracking was assessed again, using the "rule of no thumb". Tracking was considered adequate when the medial facet and the medial femoral trochlea were in congruent contact throughout the range of motion. Patellar tilt or shift was considered as maltracking.

When tracking was not adequate, a partial facetectomy was performed as follows: the patella is everted and a longitudinal line is marked along the articular surface of the lateral facet, parallel to the patellar ridge and leaving between a third and a half of the facet lateral to it (Fig. 2A and B). We tend to cut more patella when the lateral facet is elongated and deformed and be more conservative when the patella maintains its structure. Still, one must avoid cutting more than half of the facet in order to prevent paradoxical medial tilt and insufficient contact area. Using an oscillating saw the bone is cut sagittally along the marked line, cutting the lateral part of the patella out (Fig. 2C). This act should be done cautiously, avoiding damage to the soft tissue and cutting only bone. The cut fragment is carefully separated from the overlying retinaculum with a sharp scalpel blade. Using the saw, we perform a second oblique cut, beveling the remainder of the lateral facet and enhancing congruency (Fig. 2D and E). After completing the bony cuts we bring the knee to full flexion a few times in order to stretch the released tissue. The overall effect of this maneuver includes bony decompression of the lateral patellofemoral articulation and functional elongation of the lateral retinaculum. Patellar tracking is assessed again and if still unsatisfactory we perform a staged lateral retinacular release.

Continuous variables were compared using the t-test for independent samples. Discrete variables were analyzed with the χ^2 test. Differences of $P < 0.05$ were considered to be statistically significant.

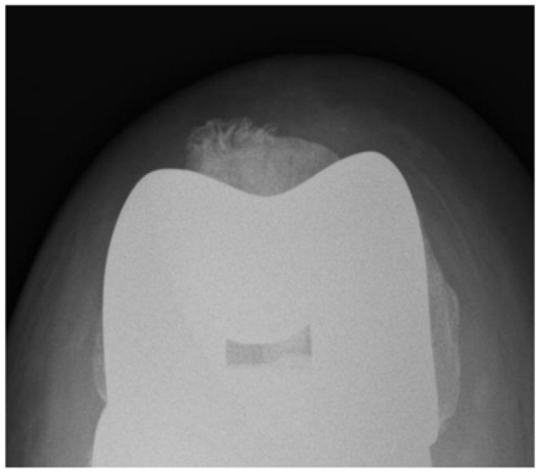

Fig. 1. A skyline view after partial patellar facetectomy showing perfect alignment of the patella with no tilt or translation.

Table 1
Patient Demographics, Clinical Scores, Tilt Angles and Lateral Translations.

	Facetectomy	Control	*P* Value
Number of knees	23	46	
Gender (F:M)	16:7	32:14	
Age: mean (range) years	70 (50–83)	71 (54–80)	.64
Deformity			
Varus/neutral	21	44	.46
Valgus	2	2	
Lost to follow-up	3	8	.59
Follow-up: mean (range) months	33 (17–45)	38 (30–53)	0.03
Clinical scores			
Knee Society Score – pain: mean (range)	94 (68–100)	92 (45–100)	.76
Knee Society Score – function: mean (range)	86 (55–100)	87 (55–100)	.60
Patellar Score: mean (range)	28 (20–30)	27 (18–30)	.47
Tilt angles			
<2°	19	36	.69
3–7°	0	1	
>8°	1	1	
Patellar lateral translation	20	37	.46
0–2 mm	0	1	
2–5 mm			
>5 mm	0	0	

Results

Intraoperatively, in 21 cases the degree of maltracking was tilt and in 2 cases subluxation of the patella. There were no actual dislocations. The technique was efficient in achieving central balanced tracking of the patella throughout the range of motion in 22 cases (Fig. 3). In one patient maltracking was still noted and a lateral release was performed.

There were no intraoperative complications related to the technique. Postoperatively there were no wound healing problems, infections, patellar fractures or radiological finding of patellar avascular necrosis. Two patients complained of persistent anterior knee pain. One of them underwent a reoperation 11 months after the TKA with liner exchange and patellar resurfacing. During surgery patellar tracking appeared perfect and after surgery anterior knee pain persisted. The second patient who had both lateral facetectomy and lateral release in the index surgery had substantial lateral patellar tilt but felt that the pain was not bad enough for him to undergo further surgery. One patient required manipulation under anesthesia due to stiffness.

At last follow-up, mean Knee Society score (KSS) was 94 (range, 68–100) and mean functional KSS was 86 (range, 55–100). Scores