

Equivalent Outcomes for Patients Following Trochleoplasty as a Primary or Revision Patellar Stabilizing Procedure

Background: Patients with trochlear dysplasia often undergo primary procedures other than a trochleoplasty for recurrent patellar instability. When these other procedures fail and a trochleoplasty is performed, it is unknown if these patients do as well as those that had a trochleoplasty as their primary operation. The purpose of this study is to compare the clinical outcomes after trochleoplasty for severe trochlear dysplasia between a group of patients who previously underwent surgery for patellar instability to a group who underwent a trochleoplasty as their initial procedure.

Methods: In this prospective cohort study with Institutional Review Board approval, 40 patients who underwent a sulcus-deepening trochleoplasty as well as additional related procedures with at least one year follow-up were divided into two cohorts: 1) patients with previous surgery for patellar instability (“revision” cohort) (N = 19) and 2) those who did not have a previous patellar instability procedure (“primary” cohort) (N = 21). Prospectively collected preoperative and postoperative knee function scores (International Knee Documentation Committee (IKDC) and Kujala), patient satisfaction (maximum score of 10), recurrent dislocation events, and reoperations were compared between the patients who had a prior patellar instability surgery to those who did not.

Results: 33 females and 7 males with an overall average age of 20.4 years and average 2.0 years of follow-up were included in the study. Compared to preoperative scores, significant increases were seen for IKDC and Kujala scores in both the primary (26.9±24.3, 21.5±22.3, respectively) and revision surgery cohorts (22.7±23.0, 12.7±15.7, respectively) with no significant differences between cohorts in the final scores (p=0.661, 0.810, respectively) or degree of improvement (p=0.624, 0.284, respectively). There were no recurrent instability events in either cohort. 23.8% (5/21) of the primary patients and 26.3% (5/19) of the revision patients underwent a secondary procedure for arthrofibrosis; the final range of motion was 127.0±13.1°, with no significant differences seen between cohorts (p=0.420). Overall, the satisfaction score was 9.2±1.8 with no significant differences between cohorts (p=0.404).

Conclusion: Patients with severe trochlear dysplasia will experience significant improvement postoperatively and will have equivalent outcomes if a trochleoplasty is performed as an index procedure or to address continued patellar instability after prior failed patellar stabilizing procedures.

Table 1. Comparison of preoperative patient characteristics between the two cohorts.

Preoperative Characteristic	Primary Cohort	Revision Cohort	p value
Total Number of Patients	21	19	-
Female Gender	17	16	0.787
Age (years)	17.4 ± 3.7	23.6 ± 7.6	0.002
Duration of Instability (months)	56.8 ± 54.3	102.8 ± 91.7	0.058
Type B Trochlea	18	16	0.894
Tobacco Use	0	0	1.000
Diabetes Mellitus	1	0	0.335
Body Mass Index (kg/m ²)	29 ± 7.0	26.0 ± 5.4	0.115

Table 2. List of procedures that the revision cohort underwent prior to the trochleoplasty. Note: Twelve patients underwent more than 1 prior patellar stabilizing procedure so the number of patients add up to more than the cohort size of 19.

Prior Procedure	Number of Patients
Anteromedialization Tibial Tubercle Osteotomy	7
Medial Patellofemoral Ligament Reconstruction	7
Medial Patellofemoral Ligament Imbrication	7
Lateral Release	9
Patellofemoral Shaving Chondroplasty	6
Removal of Knee Loose Bodies	6

Table 3. Comparison of the procedures which were performed at the same time as the trochleoplasty.

Concomitant Procedure	Primary Cohort	Revision Cohort	p value
Anteromedialization Tibial Tubercle Osteotomy	7	6	0.906
Medial Patellofemoral Ligament Reconstruction	21	19	1.000
Open Lateral Release	14	4	0.004
Any Procedure Addressing Cartilage Damage	11	7	0.324
Implantation of Particulated Juvenile Cartilage	3	2	0.720
Patellofemoral Shaving Chondroplasty	7	4	0.385
Patellofemoral Microfracture	3	1	0.342
Removal of Knee Loose Bodies	4	3	0.787

Table 4. Comparison between the two cohorts of postoperative outcomes following trochleoplasty.

Outcome Measured	Primary Cohort	Revision Cohort	p value
Follow-up Duration (years)	1.7 ± 0.7	2.4 ± 1.3	0.052
Preoperative IKDC	51.4 ± 21.5	50.8 ± 15.2	0.930
Postoperative IKDC	78.3 ± 20.8	74.9 ± 23.6	0.661
IKDC Change	26.9 ± 24.3	22.7 ± 23.0	0.624
Preoperative Kujala	64.2 ± 19.1	61.4 ± 14.0	0.702
Postoperative Kujala	83.3 ± 19.4	81.2 ± 21.2	0.810
Kujala Change	21.5 ± 22.3	12.7 ± 15.7	0.284
Satisfaction Score	9.1 ± 1.2	8.9 ± 2.5	0.404
Reoperations for Arthrofibrosis	5	5	0.873
Final Knee Range of Motion (°)	128.6 ± 7.5	125.2 ± 17.4	0.420