Comparable Long-Term Survival after Medial Meniscus Posterior Root Repair for High and Low Preoperative Outerbridge Classification Grade

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INTRODUCTION:

There has been increased focus on medial meniscal posterior root tears (MMPRT) over the last decade, as biomechanical studies demonstrated that MMPRT may be equivalent to a total meniscectomy. Medial meniscus posterior root repairs (MMPRR) have been shown to reverse this biomechanical effect and improve clinical outcomes, and consequently have become a common treatment. However, patients with MMPRT often have advanced chondral changes in the ipsilateral compartment, with a high Outerbridge Classification grade. Therefore, it is questionable whether complete relief of symptoms is possible following MMPRR in patients with high Outerbridge Classification grade. The objective of this study was to evaluate long-term survival of MMPRR and to compare long-term outcomes of patients after MMPRR based on preoperative Outerbridge Classification grades (0-2 vs 3-4). It was hypothesized that patients with Outerbridge Classification grade 3-4 would have significantly decreased survival of MMPRR and significantly inferior patient-reported outcomes (PROs).

METHODS:

Consecutive skeletally mature patients who underwent primary MMPRR performed at a single academic institution between January 2011 and September 2022 were included. Patients were categorized according to the chondral changes of the medial compartment, defined as Outerbridge Classification grade 0-2 or grade 3-4, based on diagnostic arthroscopy at the time of surgery. Failure was defined as conversion to knee arthroplasty, high tibial osteotomy, or root retear. Patient demographics, imaging, intraoperative findings, follow-up, PROs, retear events, and subsequent surgeries were collected through electronic medical record review and/or via a prospectively distributed patient survey. Chi-squared tests were used to assess associations between categorical variables, while T-test and Rank sum tests were used for continuous variables, and Kaplan-Meier estimates were used to assess survival using log-rank test. P value was set at $p<0.05$.

RESULTS:

A total of 170 patients were included in the study. Of those, 74 patients were in the Outerbridge Classification grade 0-2 group, and 96 patients were in the Outerbridge Classification grade 3-4 group. There were no significant differences between the groups in terms of age, gender, and body mass index (Table 1). The overall median survival was 11 years (Figure 1) and there were no statistically significant differences between the two groups on the survival analysis (Figure 2). There was an 80% survival at 7 years for the overall population, while there was an 80% survival at 8 years and 7 years for the Outerbridge Classification grades 0-2 vs 3-4, respectively. The overall failure rate was 18%, with a mean time to reoperation of 5 years. There were no significant differences between groups in terms of failure rate. In terms of PROs, the mean preoperative International Knee Documentation Committee (IKDC) score was 34±17, while the mean postoperative IKDC score was 63±23. The mean change in IKDC was 31±22, reaching the minimal clinically important difference (MCID) of 11.5. There were no significant differences in change in IKDC between groups.

DISCUSSION AND CONCLUSION:

There were no differences in long-term survival after MMPRR in patients with Outerbridge grades 0-2 vs 3-4, with an overall survival rate of 80% at 7.5 years independent of Outerbridge Classification grade. There were no differences in failure rates when comparing patients with Outerbridge grades 0-2 vs 3-4. Additionally, there were no significant differences in change in IKDC between patients with Outerbridge grades 0-2 vs 3-4, with both groups reaching the MCID. The findings of this study suggest that MMPRR is an effective and safe procedure regardless of grade of chondral damage, improving outcomes in patients with both high and low grade chondral damage.

Figure 1. Survival analysis of medial meniscus posterior root repairs.

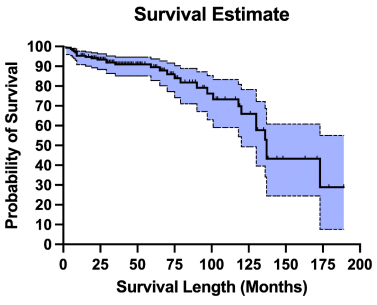

Figure 2. Survival analysis of medial meniscus posterior root repairs comparing the Outerbridge grade 0-2 versus Outerbridge grade 3-4 groups.

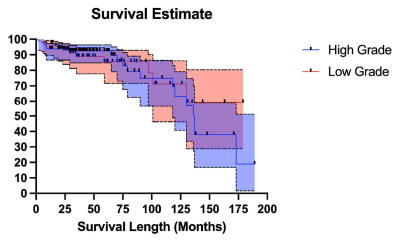

Table 1. Patient demographics and outcomes.

	Total (n=170)	Outerbridge Classification Grade 0-2 (n=74)	Outerbridge Classification Grade 3-4 (n=96)	p-value
Sex (n, %)				0.45
Male	50, 29%	24, 32%	26, 27%	
Female	120, 71%	50, 68%	70, 73%	
Age (years) (mean±SD)	53±11	51±13	54±8	0.20
BMI (mean±SD)	32±6	31±7	33±6	0.08
Follow-up time (years) (mean, range)	5, 1-16	5, 1-15	5, 1-16	0.20
Preop IKDC* (mean±SD)	34±17	30±17	37±14	0.05
Postop IKDC** (mean±SD)	63±23	66±23	60±24	0.12
Change in IKDC*** (mean±SD)	31±22	35±24	27±19	0.14
Reoperation (n, %)	30, 18%	11, 15%	19, 20%	0.40
Time to reoperation (years) (mean, range)	5, 0-14	4, 0-11	6, 0-14	0.40

BMI=body mass index, IKDC=international knee documentation committee, SD=standard deviation.

*Preop IKDC data was available for 70 patients (31 with Outerbridge Classification Grade 0-2 and 39 with Outerbridge Classification Grade 3-4).

** Postop IKDC data was available for 139 patients (64 with Outerbridge Classification Grade 0-2 and 75 with Outerbridge Classification Grade 3-4).

*** Change in IKDC data was available for 66 patients (31 with Outerbridge Classification Grade 0-2 and 35 with Outerbridge Classification Grade 3-4).