Ten-Year Follow-Up of Patients With and Without Unstable Chondral Lesions at Arthroscopic Partial Meniscectomy

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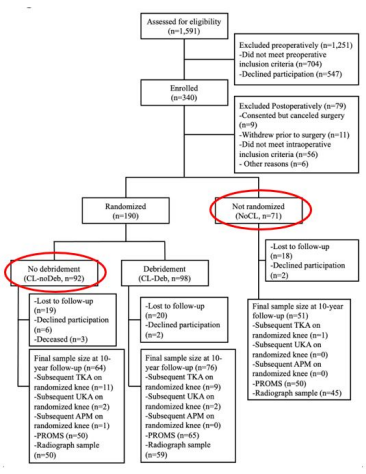
INTRODUCTION: The Chondral Lesions and Meniscal Procedures (ChAMP) trial was a level 1 trial that observed the effect of debridement (yes/no) on unstable chondral lesions encountered during APM while also following a cohort with no chondral lesions to compare outcomes. At 5 years post APM, patients without unstable chondral lesions had better outcomes than those with unstable chondral lesions left in situ.

METHODS: We conducted a secondary analysis of data from the ChAMP trial at 10-year follow-up. Ten-year outcomes for chondral lesion without debridement (CL-NoDeb) vs. no chondral lesion (NoCL) groups included the Western Ontario and McMaster Universities Arthritis Score (WOMAC), Knee Injury and Osteoarthritis Outcomes Score (KOOS), Visual Analog Scale (VAS), Short-form Health Survey (SF-36) and subsequent surgeries. Additionally, a physical assessment was performed by a trained research assistant at 10-year follow-up. Two surgical orthopaedic sports medicine fellows assessed joint space narrowing on weight-bearing radiographs. Our primary outcome was WOMAC Pain score. Continuous variables were compared with t-tests and linear regression and categorical variables were compared with chi-squared tests, Fisher Exact Tests, and logistic regression. Regression models obtained mean differences (MDs) with corresponding 95% confidence intervals by adjusting for weight. Statistical significance was defined as $p < 0.05$.

RESULTS: Of the original 163 patients (CL-NoDeb 92, NoCL 71), 115 (CL-NoDeb 64 [69.6%] and NoCL 51 [71.8%], p=0.888) had ten-year outcome measures. There were no significant demographic differences between the two groups, aside from preoperative weight and BMI. Fifteen patients (CL-NoDeb, 14 NoCL, 1) underwent subsequent surgery and were thus excluded from patient-reported outcomes collection. Among those who did not have later surgery, there was no significant difference in the WOMAC pain between the CL-NoDeb (90.3 [95% CI, 86.3-94.3]), and the NoCL group (91.3 [95% CI, 87.2-95.5]). Average adjusted SF-36 pain scores were worse in the CL-NoDeb group (76.0 [95% CI, 70.5-81.6]), compared to the NoCL group (81.3 [95% CI, 75.9-86.7]). There were no significant differences in other patient reported outcome measures, range of motion or joint space narrowing (Table 1). However, there was a statistically significant lower rate of subsequent surgery in the NoCL group compared to the CL-NoDeb group for both the index and contralateral leg (Figure 2).

DISCUSSION AND CONCLUSION: This 10-year follow-up study of patients who underwent APM found that the presence of unstable chondral lesions was associated with a significantly higher rate of subsequent arthroplasty. Patients without unstable chondral lesions had excellent outcomes at 10-year follow-up and a 2% rate of later knee arthroplasty. Careful preoperative assessment and selection criteria for APM may help define surgical indication, educate patients and reduce the rate of post-meniscectomy arthroplasty.

Figure 1: Patient Flowchart from Initial Patient Sample to Final Analytic Sample[1]



[1] Comparison groups circled in red

Figure 2: Subsequent Surgery Percentages at 10-Years Follow-up Comparing Chondral Lesion without Debridement (CL-NoDeb) (n=64) and no Chondral Lesion NoCL (n=51) Groups

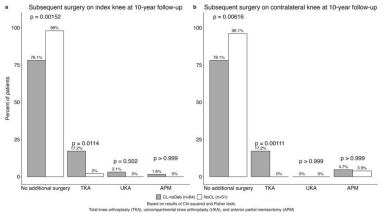


Table 1. Group Comparison of the 10-year Difference in Outcome Measures (n=100)

10-year Outcome Measure	CL-NoDeb, N=49		NoCL, N=51		Unadjusted Difference Between CL-NoDeb and NoCL		Adjusted Difference Between CL-NoDeb and NoCL	
	N	Mean (95% CI)	N	Mean (95% CI)	Mean (95% CI)	P Value	Mean (95% CI)	P Value
WOMAC								
Pain	49	90.3 (86.3, 94.3)	49	91.3 (87.2, 95.5)	-1.0 (-6.7, 4.7)	0.72	-1.0 (-7.0, 4.9)	0.73
Stiffness	50	82.3 (77.3, 87.2)	50	84.0 (78.2, 89.8)	-1.8 (-9.3, 5.8)	0.65	-0.5 (-8.8, 7.7)	0.90
Physical Function	48	92.0 (89.1, 94.9)	46	92.4 (88.0, 96.7)	-0.4 (-5.5, 4.8)	0.89	1.7 (-4.3, 2.9)	0.46
KOOS								
Pain	49	88.6 (84.3, 92.7)	48	89.7 (85.3, 94.1)	-1.1 (-7.1, 4.9)	0.72	-1.3 (-7.8, 4.8)	0.64
Other Symptoms	48	79.6 (75.8, 83.6)	48	82.1 (77.2, 84.9)	-1.4 (-8.9, 4.3)	0.60	-0.4 (-8.4, 7.7)	0.89
Function in Sport and Recreation	42	78.3 (73.7, 85.0)	42	81.9 (75.1, 88.7)	-3.8 (-13.3, 5.8)	0.43	-4.4 (-14.2, 2.5)	0.38
Quality of Life	50	81.8 (76.4, 87.1)	47	83.2 (76.4, 90.1)	-1.5 (-10.0, 7.1)	0.73	-2.2 (-11.2, 6.9)	0.64
VAS								
Pain	47	1.1 (0.7, 1.6)	48	1.1 (0.8, 1.6)	0.0 (-0.7, 0.8)	0.90	0.1 (-0.8, 0.9)	0.70
SF-36								
Pain	49	76.0 (70.5, 81.6)	49	81.3 (75.9, 86.7)	-5.3 (-12.9, 2.4)	0.18	-9.7 (-17.9, -1.5)	0.02*
Physical Functioning	48	81.7 (76.0, 87.5)	49	82.6 (76.1, 89.0)	-0.9 (-9.5, 7.6)	0.84	-1.2 (-9.5, 6.8)	0.76
General Health	49	76.9 (72.6, 81.3)	48	78.7 (73.9, 81.5)	-2.2 (-8.1, 4.6)	0.94	-2.4 (-7.7, 2.8)	0.36
Range of Motion								
Degrees of Extension	47	0.4 (-0.1, 0.9)	47	1.0 (0.5, 1.5)	-0.6 (-1.3, 0.2)	0.12	-0.4 (-1.2, 0.4)	0.39
Degrees Short of Neutral Flexion	47	0.5 (0.1, 1.0)	47	0.9 (0.4, 1.4)	-0.3 (-1.0, 0.3)	0.32	-0.5 (-1.2, 0.1)	0.10
Degrees of Flexion	47	138.6 (130.0, 133.2)	47	121.9 (119.3, 124.4)	-3.3 (-8.8, 0.3)	0.07	-1.8 (-5.2, 2.0)	0.38
Quadriceps Circumference								
Mid-portion of Patella	47	41.3 (40.3, 42.3)	47	38.7 (37.7, 39.6)	2.6 (1.3, 4.0)	0.0002*	1.9 (-0.1, 2.0)	0.07
10cm Proximal to Superior Pole	47	49.0 (47.8, 50.3)	47	43.2 (42.0, 44.4)	5.9 (2.0, 3.7)	0.00089*	0.9 (-0.7, 2.5)	0.28
Effusion								
Frequency of Presence	50		50			1.00		0.74
Yes		1 (2.0)		2 (4.0)	NA		NA	
No		49 (98.0)		48 (96.0)	NA		NA	
Severity	1		2			NA		NA
Mild		1 (100.0)		2 (100.0)	NA		NA	
Moderate		0 (0.0)		0 (0.0)	NA		NA	
Severe		0 (0.0)		0 (0.0)	NA		NA	

*Indicates a P value < 0.05