Is It Worth Repairing Unstable Discoid Menisci? A Long-Term Analysis Following Discoid Meniscus Repair with a Minimum of 5 Years Follow-Up

Steven Maxwell Henick, Emily Ferreri, Joseph N Charla, Leila Mehraban Alvandi, Edina Gjonbalaj[1], Jacob Foster Schulz, Eric Daniel Fornari[2], Mauricio Drummond
[1]Montefiore Medical Center, [2]Children's Hospital At Montefiore

INTRODUCTION:

Discoid meniscus (DM) repair is the gold standard treatment for unstable symptomatic DM. Although the DM pathological anatomy can negatively affect its healing capacity, good-to-excellent early clinical outcomes have been reported following DM repair. However, it is unclear if these outcomes can be sustained over time due to the dearth of long-term studies. The purpose of this study is to report the clinical outcomes following DM repair with a minimum of 5 years of follow-up.

METHODS:

A retrospective review was performed at a single institution consisting of patients under 21 years old who underwent arthroscopic treatment for symptomatic DM from January 2014 to December 2023 with a minimum of 5-year follow-up. Patients with stable DM underwent isolated saucerization, and those with unstable DM had saucerization with meniscal repair. Data collection included demographics, clinical presentation, meniscal pathology, surgical technique, re-operation rates, and complication rates. Patient reported outcome (PRO) scores were collected post-operatively starting at the 1-year follow-up. Patients were also called at final follow-up to confirm their function level. Continuous variables were analyzed via t-tests or Wilcoxon rank-sum tests; chi-square or Fisher's exact tests were done for categorical variables. Wilcoxon rank-sum tests compared the PRO scores between the stable and unstable meniscus groups.

RESULTS: There were 39 patients who underwent surgical management at a mean age 13.13 ± 3.75 years with a median follow-up time of 6.66 years (IQR 4.96 – 7.98). Of these, 18 (46.1%) had stable and 21 (53.9%) had unstable DM. Patients that presented with unstable DM were younger (12.2 vs 14.1, p< 0.001) and had fewer chondral lesions (0 vs 4, p=0.04). Of the 39 patients called at final follow-up, 38 responded (97.4%) and 36 (92.3%) reported their knee function had returned to pre-injury level. Among the four patients who experienced complications following their initial surgeries, three underwent a second surgical intervention (Table 1). Subgroup analysis at a median 7.36 years from surgery demonstrated significantly better PROs for the repair group compared to the non-repair group as seen on Tengner Lysholm (99.0 vs 85.5, p=0.02), Pedi-IKDC (98.3 vs 88.5, p< 0.01), KOOS Child Symptom (100 vs 87.8, p< 0.01), and KOOS Child ADL (100 vs 99.0, p=0.04) PROs (Table 2).

DISCUSSION AND CONCLUSION:

The majority (95%) of patients returned to their pre-injury function level at a minimum of 5 years of follow-up from DM surgery and at an average of 7 years post-operatively. Long term subgroup analysis demonstrated better PROs in the DM repair group compared with non-repair group. Our findings support DM preservation surgery as an effective and safe technique that leads to sustainable long-term clinical outcomes.

Table 1. Group Demographics & Characteristics

Demographics & Characteristics of the Participants		Stability		
	n = 39	Stable n = 18	Unstable n = 21	P value
Age at Surgery (years) - Mean ± SD	13.13 ± 3.75	14.19 ± 3.63	12.22 ± 3.68	<0.001
Years Since Surgery - Median (IQR)	6.66 (4.96 - 7.98)	7.33 (5.24 - 8.68)	5.86 (4.96 - 7.24)	0.14
Sex				0.84
Male - No. (%)	21 (53.85)	10 (55.56)	11 (52.38)	
Female	18 (46.15)	8 (44.44)	10 (47.62)	
Ethnicity				0.68
Not Hispanic and/or Latino	7 (19.44)	4 (25.00)	3 (15.00)	
Hispanic and/or Latino	29 (80.56)	12 (75.00)	17 (85.00)	
BMI Percentile	93.50 (65.00 - 97.00)	93.00 (82.00 - 97.00)	94.00 (65.00 - 97.00)	0.76
Overweight				0.33
BMI < 85th Percentile	14 (35.90)	5 (27.78)	9 (42.86)	
BMI ≥ 85th Percentile	25 (64.10)	13 (72.22)	12 (57.14)	
Chondral Lesion				0.04
Yes	4 (10.26)	4 (22.22)	0 (0.00)	
No	35 (89.74)	14 (77.78)	21 (100.00)	
ACL Lesion				0.59
Yes	3 (7.69)	2 (11.11)	1 (4.76)	
No	36 (92.31)	16 (88.89)	20 (95.24)	
Skeletal Maturity				0.14
Mature	21 (53.85)	12 (66.67)	9 (42.86)	
Immature	18 (46.15)	6 (33.33)	12 (57.14)	
Scope Findings				<0.001
No Tear	7 (17.95)	7 (38.89)	0 (0.00)	
Posterior Horn &/or Body	13 (33.33)	10 (55.56)	3 (14.29)	
Anterior Horn	10 (25.64)	1 (5.56)	9 (42.86)	
Posterior & Anterior	9 (23.08)	0 (0.00)	9 (42.86)	
Procedure				<0.001
Saucerization	19 (48.72)	18 (100.00)	1 (4.76)	
Posterior Repair	2 (5.13)	0 (0.00)	2 (9.52)	
Anterior Repair	9 (23.08)	0 (0.00)	9 (42.86)	
Posterior & Anterior Repair	9 (23.08)	0 (0.00)	9 (42.86)	
Mechanical Symptoms				0.62
Yes	20 (51.28)	10 (55.56)	10 (47.62)	
No	19 (48.72)	8 (44.44)	11 (52.38)	
Repeat Surgery				0.59
Yes	3 (7.69)	2 (11.11)	1 (4.77)	
No	36 (92.31)	16 (88.89)	20 (95.23)	
Return to Pre-Injury Level				>0.99
Yes	36 (94.74)	17 (94.44)	19 (95.00)	
No	2 (5.26)	1 (5.56)	1 (5.00)	

Table 2a. Post-Operative PRO Scores for All Patients at Minimum 1-Year Follow-Up

All Post-Op PRO Scores	n = 27	Median (IQR)	Stability		P value
			Stable (n = 11)	Unstable (n = 16)	
Tengner Lysholm		93.00 (82.00 - 100.00)	85.50 (79.50 - 85.00)	95.00 (85.00 - 100.00)	0.20
Pedi-IKDC		92.00 (63.00 - 98.00)	88.51 (60.90 - 92.00)	96.00 (67.82 - 100.00)	0.13
KOOS Child Symptom		93.00 (82.00 - 100.00)	85.71 (82.00 - 96.99)	98.00 (83.93 - 100.00)	0.19
KOOS Child Pain		94.00 (81.25 - 100.00)	94.00 (81.00 - 100.00)	96.94 (85.94 - 100.00)	0.59
KOOS Child ADL		100.00 (88.64 - 100.00)	98.00 (87.00 - 100.00)	95.00 (71.07 - 100.00)	0.43
KOOS Child Sport		95.50 (79.00 - 100.00)	96.00 (79.00 - 100.00)	95.00 (71.07 - 100.00)	0.93
KOOS Child QOL		83.00 (69.00 - 100.00)	75.00 (50.00 - 92.00)	85.25 (69.91 - 100.00)	0.31

Table 2b. Post-Operative PRO Scores Obtained at Least 5 Years Post-Operatively

Post-Op Scores > 5 years	n = 13	Median (IQR)	Stability		P value
			Stable (n = 6)	Unstable (n = 7)	
Tengner Lysholm		95.00 (96.00 - 100.00)	85.50 (82.00 - 86.00)	99.00 (95.00 - 100.00)	0.02
Pedi-IKDC		96.00 (88.51 - 100.00)	88.51 (60.90 - 91.00)	98.30 (96.00 - 100.00)	<0.01
KOOS Child Symptom		96.00 (90.00 - 100.00)	87.86 (82.00 - 96.00)	100.00 (96.00 - 100.00)	<0.01
KOOS Child Pain		100.00 (94.00 - 100.00)	91.00 (81.25 - 100.00)	100.00 (97.00 - 100.00)	0.39
KOOS Child ADL		100.00 (100.00 - 100.00)	99.00 (97.00 - 100.00)	100.00 (100.00 - 100.00)	0.04
KOOS Child Sport		100.00 (95.00 - 100.00)	100.00 (85.00 - 100.00)	100.00 (95.00 - 100.00)	>0.99
KOOS Child QOL		92.00 (70.83 - 100.00)	83.50 (70.83 - 92.00)	100.00 (69.00 - 100.00)	0.24