BMI Does Not Impact Long-Term Outcomes of Symptomatic Pediatric Discoid Lateral Meniscus Patients Following Arthroscopic Management

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Disclosure

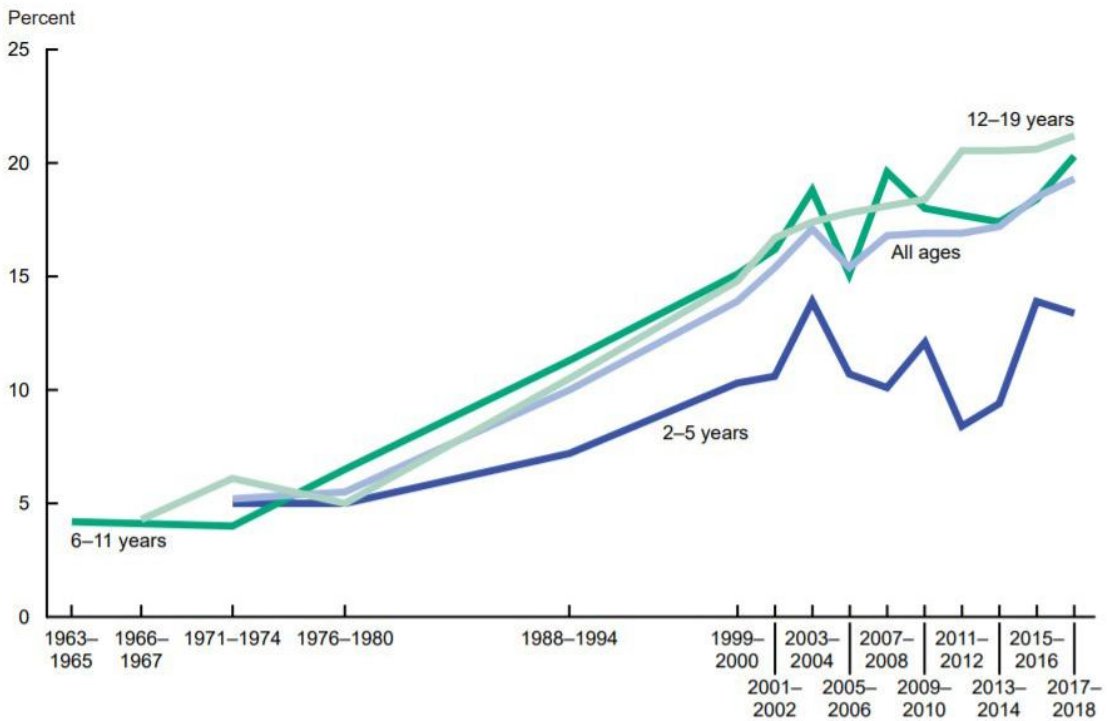
- I and my co-authors have no relevant disclosures.

Introduction

- Prevalence of **obesity** in the U.S. has more than tripled since the 1960s and now affects 1 in 5 children.

- Linked to Blount's disease, SCFE, scoliosis progression, advanced bone age, and higher fracture risk.

  - Higher body mass index (BMI) **alters joint biomechanics**, leading to more frequent complex meniscal and ligament injuries.



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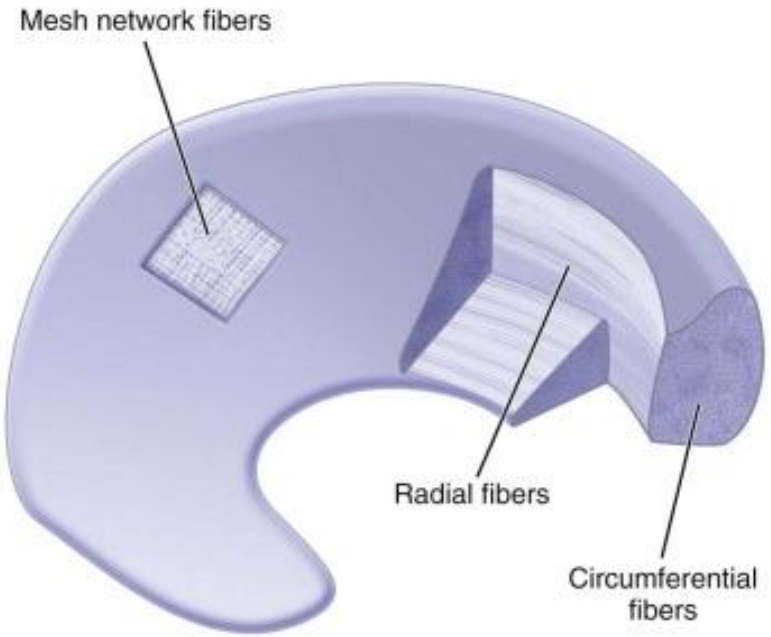
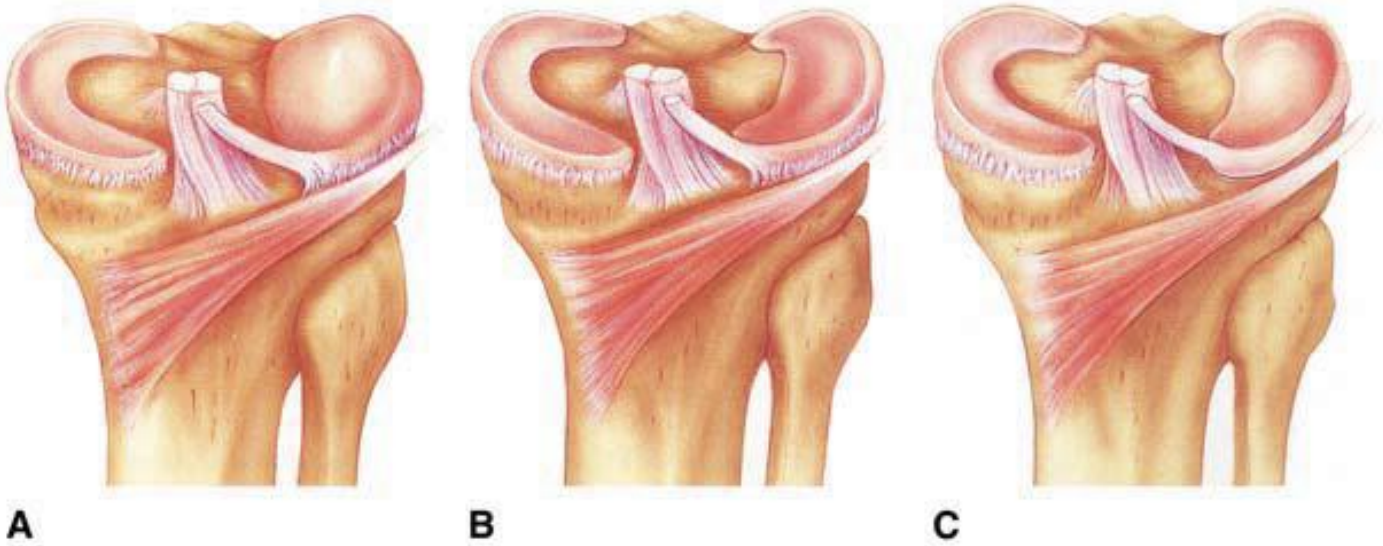
Overweight & Obesity Statistics - NIDDK (National Institute of Diabetes and Digestive and Kidney Diseases, 2021).

Introduction

- Discoid lateral meniscus (DLM)
  - Common anatomic knee variant (thickened body, disc-like shape)
  - Abnormal collagen fibers (prone to tears)
  - Less vascularity
  - Peripheral rim instability



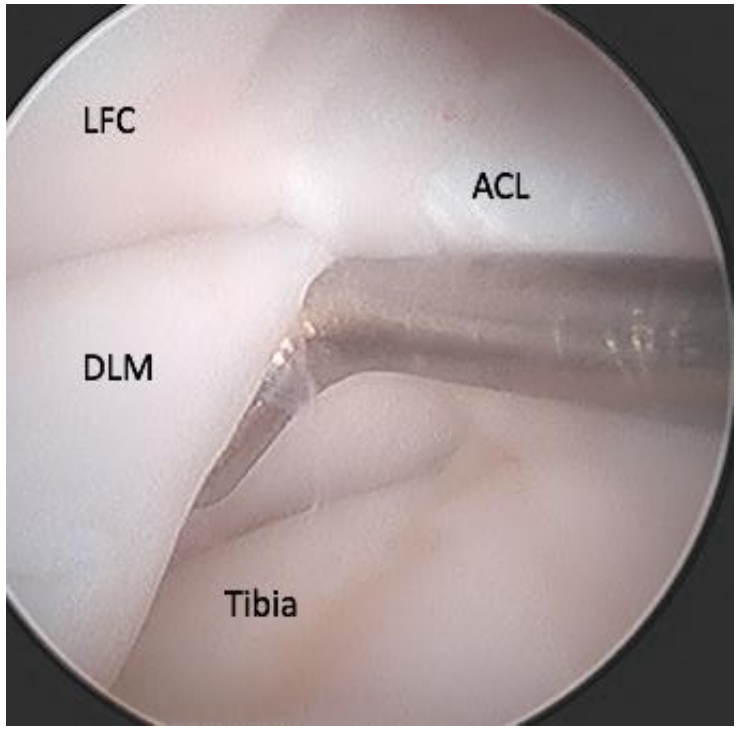


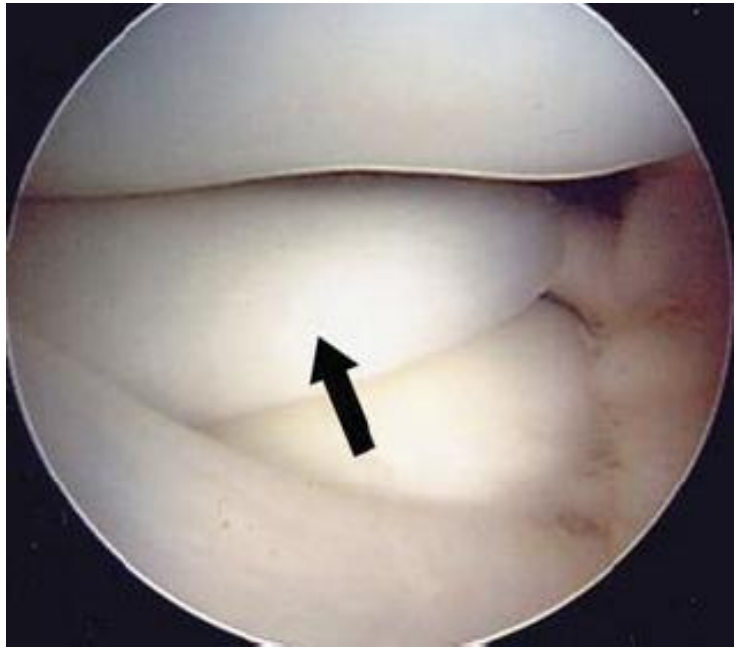
Meniscal Tears and Discoid Meniscus in Children: Diagnosis and Treatment (Kramer & Micheli, 2009).

Introduction

- Higher BMI has been linked to worse patient-reported outcomes and more cartilage lesions after surgery, though findings are inconsistent.

- Limited research exists on long-term outcomes of DLM surgery in relation to BMI, especially in U.S. pediatric populations





Meniscal Tears and Discoid Meniscus in Children: Diagnosis and Treatment (Kramer & Micheli, 2009).

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Objective

- To investigate the relationship between BMI and long-term outcomes of symptomatic pediatric DLM patients following arthroscopic management, which we demarcate as a minimum of 5 years of follow-up.

Methods

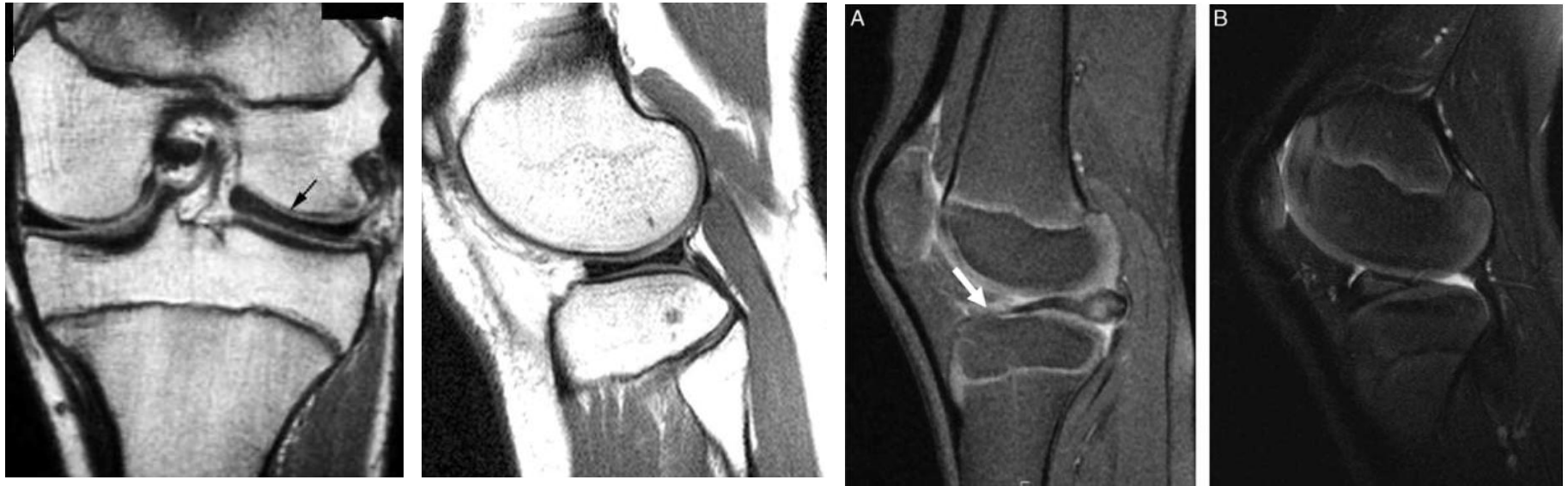
- Retrospective cohort study, single academic institution
- Normal weight (<85th percentile) vs overweight/obese (≥85th percentile) per 2022 CDC Extended BMI-for-Age Growth Charts.
- Data Collected: Demographics (age, sex, ethnicity, COI, insurance), skeletal maturity via pre-op radiographs, clinical presentation, and ROM deficits

Inclusion Criteria:

< 21 years old at surgery

Minimum 5-yr follow-up

Arthroscopic treatment for symptomatic DLM



Saucerization and Repair of Discoid Lateral Menisci With Peripheral Rim Instability: Intermediate-Term Outcomes in Children and Adolescents (Perkins et al, 2021).

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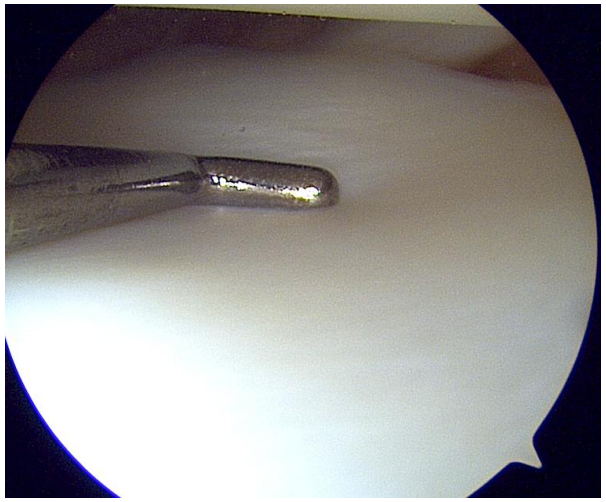
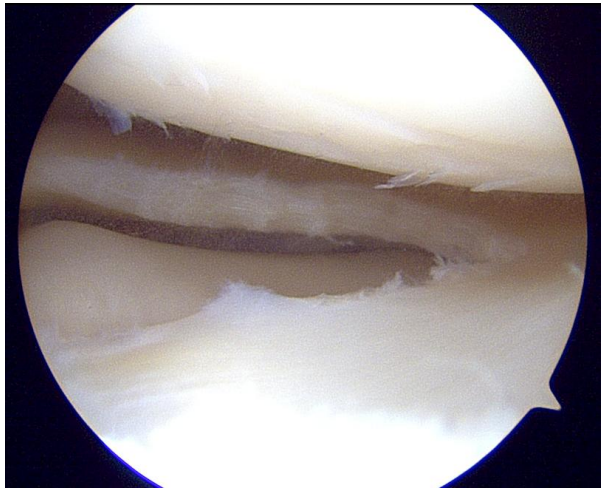
Methods

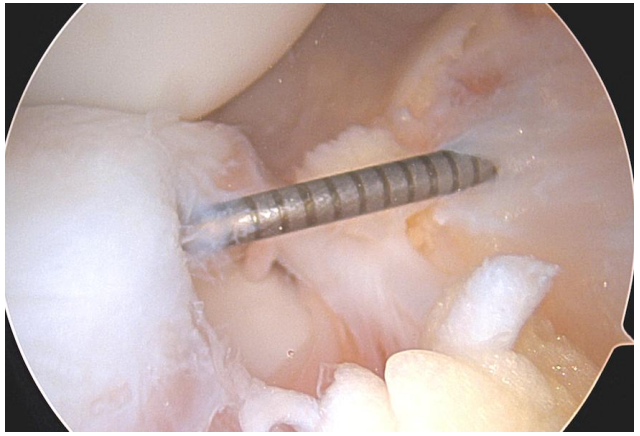
- Arthroscopic saucerization ± meniscal repair based on **stability**
- Repeat surgery, return to activity, and **PROs (Tegner Lysholm, Pedi-IKDC, KOOS-Child)** collected via EPIC or phone.
- **Functional Status** assessed at final follow-up with additional questions for those without PROs, including SANE-style comparison to unaffected knee.
- **Statistical Analysis**: t-tests, Wilcoxon rank-sum, chi-square/Fisher's exact test; significance set at $p<0.05$; analysis performed in R (v4.2.1).

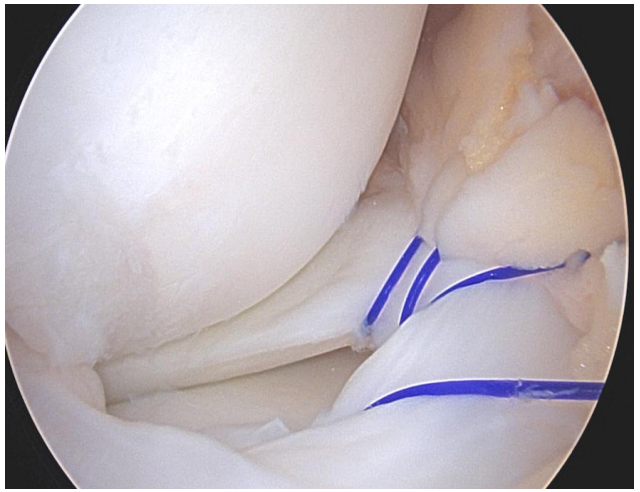
Stable





Unstable





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Results

	Total (N = 36)	< 85th % (N = 14)	≥ 85th % (N = 22)	P-value
BMI (kg/m2) - median (IQR)	23.31 (19.34, 29.11)	18.57 (15.98 - 20.95)	27.85 (25.38, 30.09)	**<0.001**
Age at Surgery (Years)	13.31 ± 3.82	12.07 ± 3.97	14.09 ± 3.60	0.124
Years Since Surgery - Median (IQR)	8.08 (5.96 - 8.92)	8.09 (6.58 - 8.40)	7.83 (5.90 – 9.14)	0.538
Repeat Surgery Yes No	 3 (8.3) 33 (91.7)	 2 (14.3) 12 (85.7)	 1 (4.5) 21 (95.5)	>0.99
Procedure Saucerization Posterior Repair Anterior Repair Anterior & Posterior Repair	 19 (52.8) 2 (5.6) 8 (22.2) 7 (19.4)	 5 (35.7) 1 (7.1) 5 (35.7) 3 (21.4)	 14 (63.6) 1 (4.5) 3 (13.6) 4 (18.2)	0.349

No differences between the groups in: sex, ethnicity, skeletal maturity, mechanical symptoms

MRI correlation with arthroscopic findings = 82%

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Results

- 5-year follow-up
  - acceptable-to-exceptional outcomes
    - **KOOS**
      - >75 satisfaction
    - **Pedi-IKDC**
      - >90 (exceptional)
    - **Tegner**
      - 95-100 (exceptional)
      - 84-94 (acceptable)
  - No significant differences
- 97% after 5 years returned to pre-injury level

Postoperative PRO Scores n = 22		BMI		P value
	Median (IQR)	< 85th % N = 9	≥ 85th % N = 13	
Tengner Lysholm	86.00 (79.50, 100.00)	95.00 (81.00, 100.00)	85.50 (79.00, 100.00)	0.974
Pedi-IKDC	92.00 (62.20, 96.91)	93.00 (87.38, 99.14)	90.83 (60.60, 96.29)	0.536
KOOS Child Symptom	89.28 (69.43, 100.00)	92.26 (83.03, 100.00)	82.14 (67.86, 100.00)	0.586
KOOS Child Pain	92.86 (78.12, 100.00)	93.30 (78.91, 100.00)	87.50 (78.12, 100.00)	0.824
KOOS Child ADL	97.73 (80.91, 100.00)	98.86 (85.23, 100.00)	97.73 (80.00, 100.00)	0.674
KOOS Child Sport	96.43 (59.82, 100.00)	96.43 (78.57, 100.00)	96.43 (53.57, 100.00)	0.755
KOOS Child QOL	79.58 (48.96, 91.00)	87.50 (70.83, 100.00)	79.16 (33.33, 87.50)	0.16

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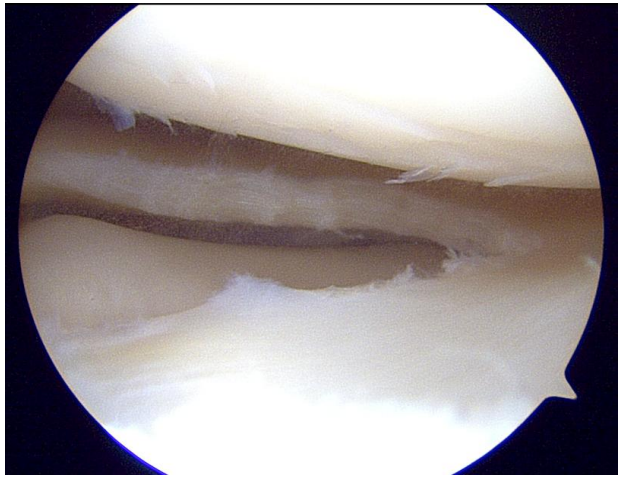
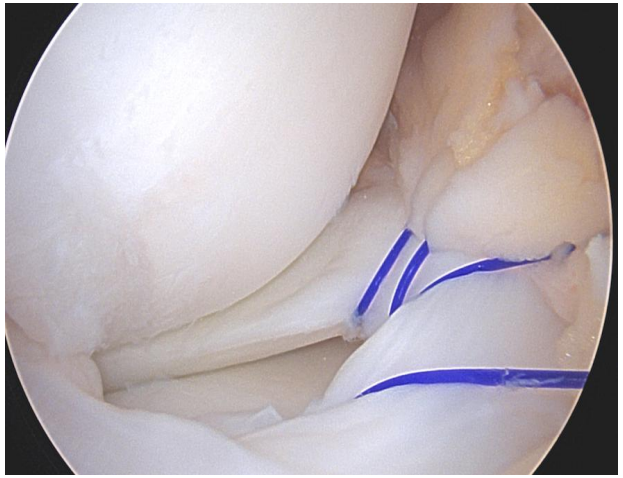
Conclusions

- Overweight/obese pediatric and adolescent patients have comparable acceptable-to-exceptional outcomes to patients who are normal weight at least 5 years following arthroscopic treatment for symptomatic DLM
  - High rate (97.2%) of return to preinjury level of activities
  - Low complication rate (8.3%).
- Weight-related factors should not deter surgical management of overweight or obese symptomatic DLM patients.





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Limitations

- Retrospective review
- Small sample size, BMI cannot differentiate between body adiposity and muscle mass

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