STRONGER SCIENCE **BETTER HEALTH**

MRI Prediction of Surgical Treatment for Juvenile Osteochondritis Dissecans

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Introduction, Hypothesis, Methods

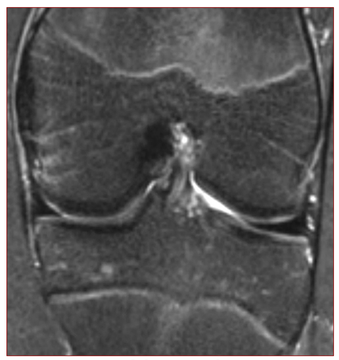
Introduction

Juvenile osteochondritis dissecans (OCD) is an abnormality of joint cartilage and its underlying bone.

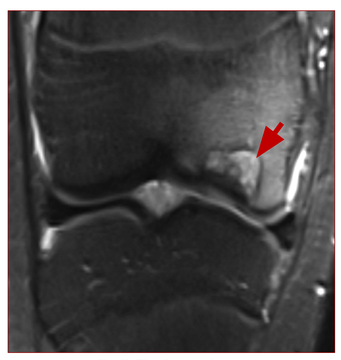
- Leading cause of joint pain in children (Kessler et al., 2014. Am J Sports Med).
- Cause of early osteoarthritis and osteonecrosis (Hevesi et al., 2020. Cartilage).
- Exact cause remains unknown (Cabral et al., 2023. J Child's Orthop).
- **Magnetic resonance imaging (MRI)** aids management by assessing the mechanical stability of the bone and cartilage defects. Unfortunately, imaging criteria established for adults do not translate well to juvenile patients (Kijowski et al., 2008. Radiology).

Aim

To determine whether quantitative analysis of standard MRI sequences can predict the need for surgery in juvenile OCD.



Normal



OCD Lesion

Hypothesis

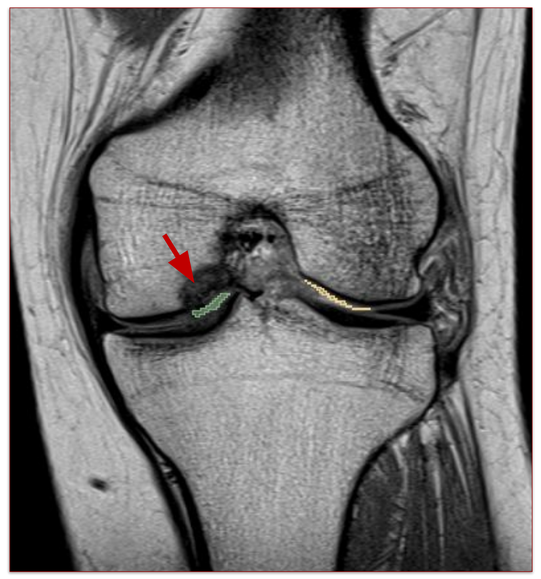
MRI signal intensity will discriminate between surgical and non-surgical patients.

Patient Data

- 41 Patients
- 25 Male, 16 Female
- Average Age: 12.5 years
- Location (Knee: 51%, Ankle: 37%, Elbow: 12%)
- 17 went to surgery, 24 did not
- At surgery, 9 were stable, 8 were not

Methods

- IRB Approved (2016-2023)
- IU Health Radiology Information System
- Keywords: "osteochondral lesions," "OCD," and "osteochondritis dissecans"
- **41 Patients Analyzed (512 Total)**
- Data from Each Patient
  - Sex
  - Age
  - Joint (Knee, Elbow, Ankle)
  - Management (Surgery or No Surgery)
  - Surgical Findings (Stable or Unstable)
  - Anatomy Sequence (PD, T1) Signal
  - Fluid Sequence (STIR, T2 FS) Signal



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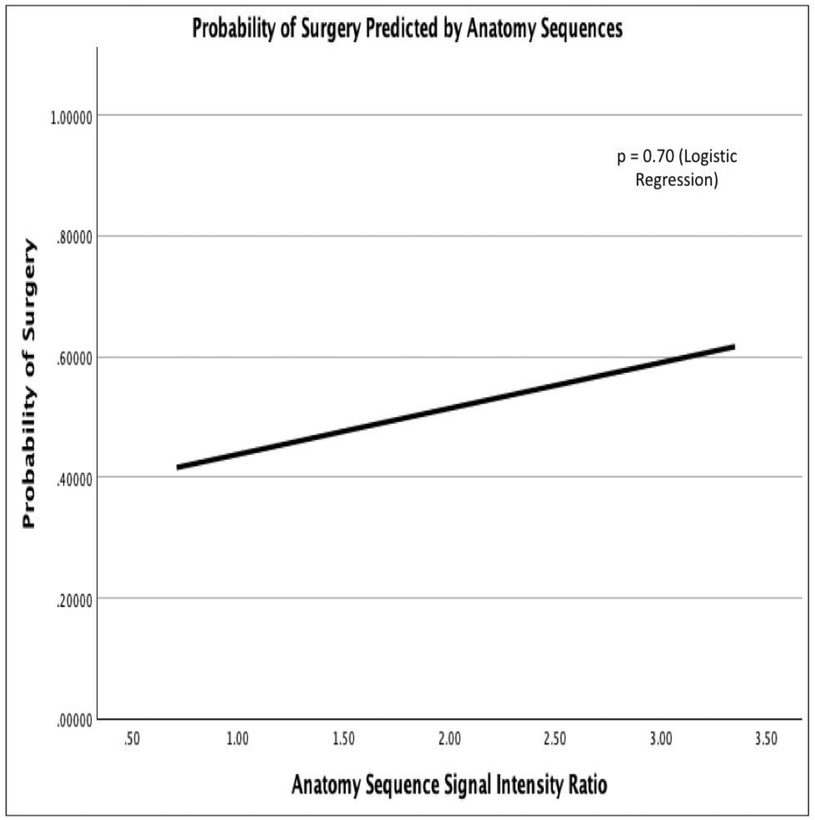
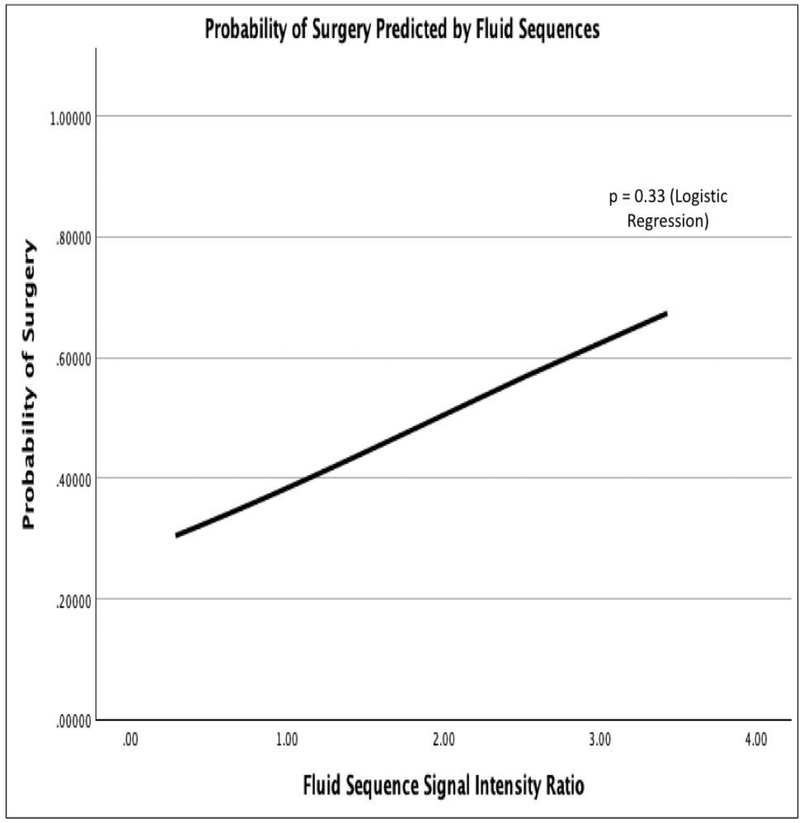
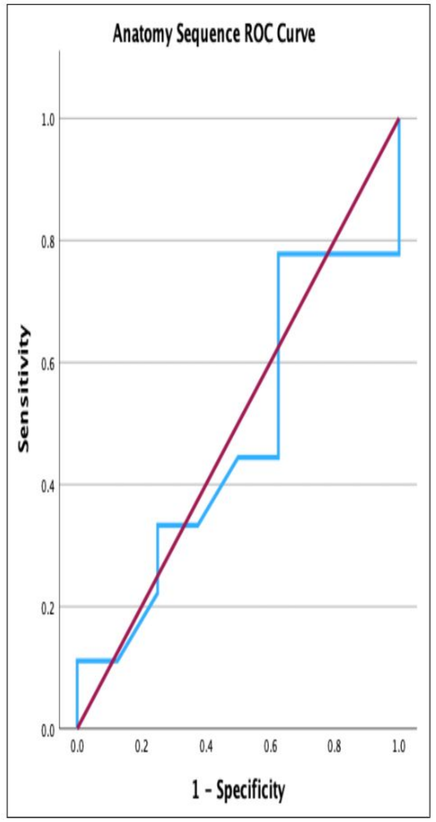
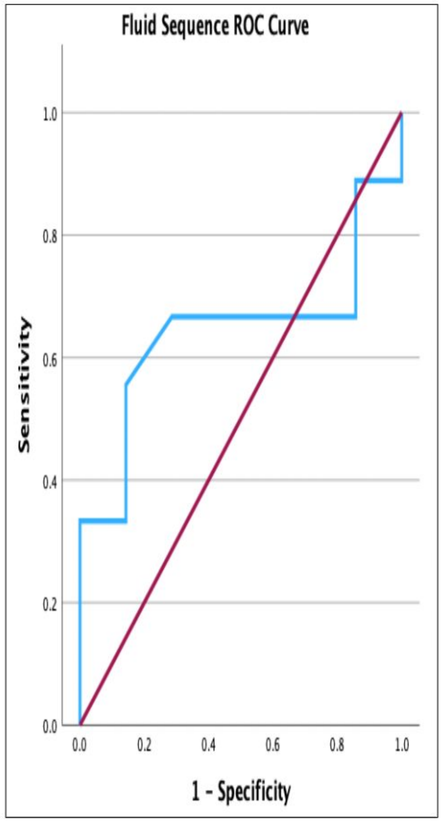
Results









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Conclusions & Future Directions

Conclusions

- Anatomy sequences do NOT predict surgery.
- Fluid sequences do NOT predict surgery.
- Signal intensity from routine sequences do not predict stability at surgery.

Future Directions

- Evaluation of Individual Joints
- Clinical MRI Cartilage Sequences
- Quantitative Research MRI Sequences
- Collaboration with Orthopedic Surgery

Acknowledgements

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