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# Title: Outcomes of Operative Fixation of Loose Trochlear Osteochondral Defects Compared Based On Skeletal Maturity

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# Disclosures:

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- Conflicts of interest: None of the authors have conflicts of interest or commercial relations in regard to this study
- Availability of data and material: Data is available upon request
- Compliance with Ethical Standards: All aspects of the study were approved by the relevant institutional review board.

# Background

- Osteochondritis dissecans (OCD) is a musculoskeletal disorder that causes defects of articular cartilage and underlying bone with incidence of 6-11 per 100,000 person-years [1-3].
- Osteochondritis dissecans commonly affects juvenile and young adult populations, often presenting with activity-related pain.
- Current treatment options for grades III and IV OCD range from excision and microfracture of the remaining crater to articular chondrocyte implantation, and replacement and fixation of the defect with up to 90% of cases completely healing[3,4].

# Background (cont'd)

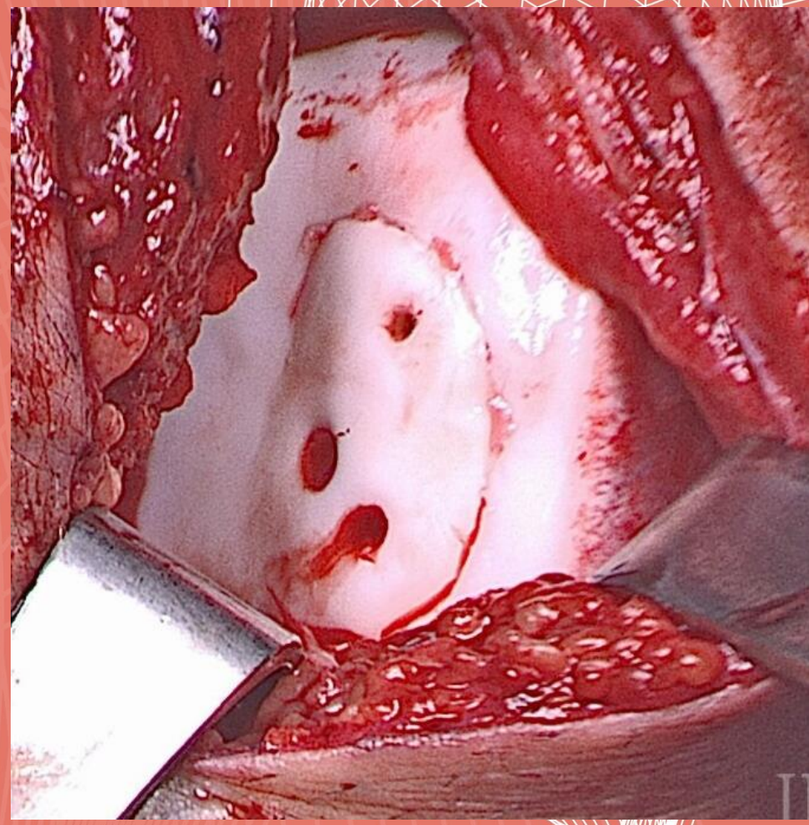
- Osteochondritis dissecans grading scale[5]

| | |
|---|---|
| Grade I | Stable to arthroscopic probing |
| Grade II | Intact cartilage with underlying separation |
| Grade III | Partially detached lesion |
| Grade IV | Loose bodies of cartilage ± underlying bone |

- Hypothesis: We hypothesize that loose body fixation results in similar healing rates in skeletally immature (SI) and mature (SM) patients and that no differences in patient-reported outcomes exist based on skeletal maturity.

# Materials & Methods

- Retrospective chart review of patients having undergone surgical intervention for a grade IV OCD lesion between 2010 and 2021.
- All procedures were performed under general anesthetic beginning with routine diagnostic arthroscopy which was then converted to open procedure for fixation.
- Fixation was achieved Lactosorb 2.0 nails or ConMed SmartNails of differing length and gauge as appropriate for defect size.



# Materials & Methods (cont'd)

- Information collected: Demographic information, radiographic findings including skeletal maturity; OCD lesion location on the trochlea; OCD lesion size, patient-reported outcomes (Knee Injury and Osteoarthritis Outcome Scores [KOOS] and Marx activity scores); and time to follow-up.

- Outcomes were assessed by comparing patient-reported outcomes between groups based on skeletal maturity

# Results – Patient Demographics

- 12 patients were identified with mean follow-up of 6+ years. Demographic similarities existed between skeletally mature and immature groups.

| TABLE 1<br>Demographics | | | |
|---|---|---|---|
| | SM (5) | SI (7) | Gross (12) |
| **Age at Surgery (years)** | 22.1 ± 8.4 | 14.6 ± 0.6 | 17.7 ± 6.4 |
| **Time to Follow-up (months)** | 62.9 ± 52.7 | 88.0 ± 47.1 | 77.5 ± 48.8 |
| **OCD Lesion Size (cm2)** | 2.97 ± 1.05 | 3.37 ± 1.54 | 3.20 ± 1.32 |
| **Number of Failures** | 1 | 1 | 2 |
| **Success %** | 80.0% | 85.7% | 83.30% |

Table 1. Relevant Patient demographics of the groups from all participants identified for the study. Reported as mean ± SD

# Results – Patient Reported Outcomes

- 10 out of 12 patients were available for follow-up and PRO's (83.3%) at a mean follow-up of 90.6 ± 42.2 months (range, 7.5-145)
- Similarities persist across all reported outcomes with no significant difference based on skeletal maturity.

**TABLE 2**
**Patient Reported Outcomes**

| | SM (4) | SI (6) | Gross (10) | SM vs SI T-Test |
|---|---|---|---|---|
| **Symptoms / Stiffness** | 86.8 ± 11.7 | 94.0 ± 5.78 | 91.1 ± 8.9 | p = 0.315 |
| **Pain** | 87.3 ± 13.4 | 96.2 ± 6.62 | 92.6 ± 10.3 | p = 0.286 |
| **Functions of Daily Living** | 94.8 ± 10.5 | 99.2 ± 1.60 | 97.4 ± 6.6 | p = 0.463 |
| **Sports / Recreation** | 71.3 ± 29.6 | 91.7 ± 11.25 | 83.5 ± 21.7 | p = 0.265 |
| **Quality of Life** | 62.5 ± 33.4 | 86.5 ± 16.6 | 76.9 ± 26.1 | p = 0.253 |
| **KOOS Global** | 80.5 ± 18.8 | 93.3 ± 7.4 | 88.2 ± 13.9 | p = 0.271 |
| **Marx Activity Rating Scale** | 8.0 ± 7.5 | 10.2 ± 4.6 | 9.3 ± 5.7 | p = 0.631 |
| **Required Repeat surgery** | 1 (25.0%) | 1 (16.7%) | 2 (20%) | p = 0.533^ |

Table 2. Results mean ± SD from telephone follow-up: KOOS score subtypes, KOOS global, MARS and success rate reported by group and gross result. Quantitative statistics reported in the final column comparing SM to SI. (^ indicates 2 x 2 Fischer's Exact test).

# Results

**Most important finding:** Regardless of skeletal maturity, ORIF of loose trochlear OCD lesions may be an effective treatment for fragments amenable to fixation.

# Conclusions

- Open reduction internal fixation of loose osteochondral lesions of the trochlea provides good outcomes for patients who undergo the surgery regardless of skeletal maturity.

- This treatment modality appears to yield favorable outcomes for patients with relatively high KOOS scores, and low failure rate. ORIF of loose trochlear OCD lesions may be an effective treatment for fragments amenable to fixation.

- Further study is needed with larger sample size and longer follow-up to help mitigate biases and confounding variables

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# Thank You!