A Comparison of National Trends and Institutional Experience in the Surgical Management of Capitellum Osteochondritis Dissecans in Adolescents

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ABSTRACT

Background:

Capitellar osteochondritis dissecans (OCD) is an uncommon but clinically significant elbow pathology in high level adolescent athletes. While osteochondral autograft transfer (OAT) has recently become more commonly used to treat unstable lesions, national-level data on epidemiologic trends, outcomes, and donor site morbidity remain limited.

Methods:

We used the PearlDiver M170Ortho national insurance claims database (2010–2022) to identify patients aged 10–25 years diagnosed with capitellar OCD lesions. Surgical procedures within 30 days of diagnosis were categorized as OAT, debridement, loose body removal, or others. Postoperative outcomes including complications, 30-day readmissions, and subsequent knee procedures (as a measure of donorsite morbidity)—were assessed. A 1:1 propensity score-matched analysis was used to compare outcomes between OAT and debridement cohorts. These findings were contextualized by comparing the results to a high-volume institutional case series comprising detailed lesion characteristics, intraoperative decisionmaking, and early clinical outcomes.

Results:

A total of 2,533 (4.2%) of 60,018 patients diagnosed with capitellar OCD lesions between 2000 and 2022 underwent surgical intervention. Most patients were adolescent males (mean age 16.0 ± 2.1 years; 75% male) and the most common procedure during the 22-year study period was arthroscopic debridement (n=1050). This was followed by microfracture (n=397), and osteochondral autograft (n=289).

Surgical volume trended upward modestly during the study period, with an increased utilization of OAT and microfracture procedures after 2015. There were four times the number of OAT procedures performed in 2022 (n=20) compared to 2000 (n=5) whereas the number of debridement procedures performed per year only increased two-fold. The overall postoperative complication rate was 3.5%, with unadjusted rates higher in the OAT group (5.0%) than in debridement (2.0%), or microfracture (3.0%) cohorts (p < 0.05). Propensity score–matched analysis comparing OAT and arthroscopic debridement/microfracture (matched on age, sex, region, and comorbidity) demonstrated no statistically significant differences in complication or readmission rates. In the refined cohort, fewer than 5% of OAT patients underwent a subsequent ipsilateral knee procedure, suggesting a lower—but still notable—rate of potential donor-site morbidity. Adjusted odds ratios for complications and readmissions approached 1.0 with non-significant p-values, suggesting that differences in unadjusted outcomes may reflect underlying selection bias.

Institutional data from a high-volume referral center demonstrates a higher utilization of OAT, especially in skeletally mature adolescent athletes with unstable or high-grade lesions. At long-term follow-up, 19/20 (95%) patients returned to a high level of sports participation, had excellent early functional outcomes, and there were no instances of donor site morbidity.

Conclusion:

This is the first national-level database study to evaluate surgical treatment patterns and outcomes for capitellar OCD in adolescents. National claims data reflects a steady increase in OATS, particularly during the last decade, despite it representing <20% of all coded procedures. Short-term complication and readmission rates are low across all procedures, and ipsilateral knee procedures—used here as a surrogate for donor-site morbidity—were infrequent. Supplementing this with institutional data highlights the overall low complication rates and high return to sport compared to debridement or microfracture alone, supporting the increasing use of OATS capitellar reconstruction. The findings underscore the need for integrated prospective studies that combine large-scale trend analysis with detailed imaging and patient-reported outcomes to refine surgical indications and optimize long-term results.

Keywords:

Capitellar OCD; osteochondritis dissecans; osteochondral autograft transfer; elbow surgery; national claims data; donor site morbidity; adolescent sports injuries.

