Long-Term Outcomes of Osteochondral Autologous Transplantation Surgery in Adolescent Athletes with Capitellar Osteochondritis Dissecans

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Introduction: Osteochondritis dissecans of the capitellum is a common condition in adolescent overhead athletes, causing pain during physical activity, limited motion range, and functional impairments. While its exact cause is not fully understood, repetitive microtrauma and reduced blood supply are thought to contribute to lesion development. Traditional surgeries for unstable OCD lesions often fail to restore cartilage or subchondral bone, potentially leading to further joint problems. Osteochondral autograft transfers have emerged as a promising alternative that aims to both restore osteochondral structure and improve sports-related outcomes. This study examines the long-term impact of OATs on capitellar OCD lesions with the hypothesis that such interventions can prevent long-term elbow disability and facilitate a return to athletic activities.

Materials and Methods: A retrospective review of patients who underwent OATS between 2009 and 2023 was performed. Demographic data, preoperative clinical information, radiographic assessments, intraoperative findings, and postoperative outcomes were collected. Clinical and radiographic evaluations were performed, and preoperative MRI was analyzed. Intraoperative data, including graft dimensions and histopathology, were recorded. Postoperative data included MRI, complications, range of motion, return to sports, and patient satisfaction.

Results: 17 patients (15 males, 2 females) met inclusion criteria, with a mean follow-up duration of 62 months (range 12-170). The mean age of the group was 14 years (±3, range 11-19). All patients were athletes, with 15 competing at the elite level and 2 at the recreational level. Baseball was the most prevalent sport among these athletes. Mean arc of motion increased from 127° ± 19 (range 80-150) preoperatively to 137°± 10 (range 115-150) postoperatively. Four patients had previously undergone surgical treatments at outside institutions. All lesions exhibited delamination and instability. Intraoperatively, loose bodies were observed in 4 patients, and histopathological analysis showed papillary hypertrophy in 53% and mucoid/myxomatous degeneration in 59% of patients. A uniform approach using a single osteochondral plug was applied in all surgeries. One patient required a contracture release at 11 months due to stiffness. All postoperative MRIs confirmed incorporation of the graft and restoration of joint congruity. All athletes successfully resumed their sports activities at an average of 6 months ±3 (range 3-12), with the exception of one elite athlete who did not return to the previous competitive level in the same sport. No sign or evidence of decline in function was observed throughout the follow-up period.

Discussion:
The etiology of capitellar osteochondritis dissecans (OCD) is complex, involving repetitive microtrauma and joint inflammation. This study has identified synovial inflammation as a component of this disease process. OATS has proven to be an effective treatment for capitellar OCD in adolescent overhead athletes. The restoration of osteochondral architecture provides both short-term and long-term elbow pain relief and restoration of high-level function. These findings emphasize the procedure's effectiveness and can inform preoperative counseling for patients with capitellar OCD. However, additional research is advised to improve management strategies for this condition to optimize patient care and functional recovery.

References

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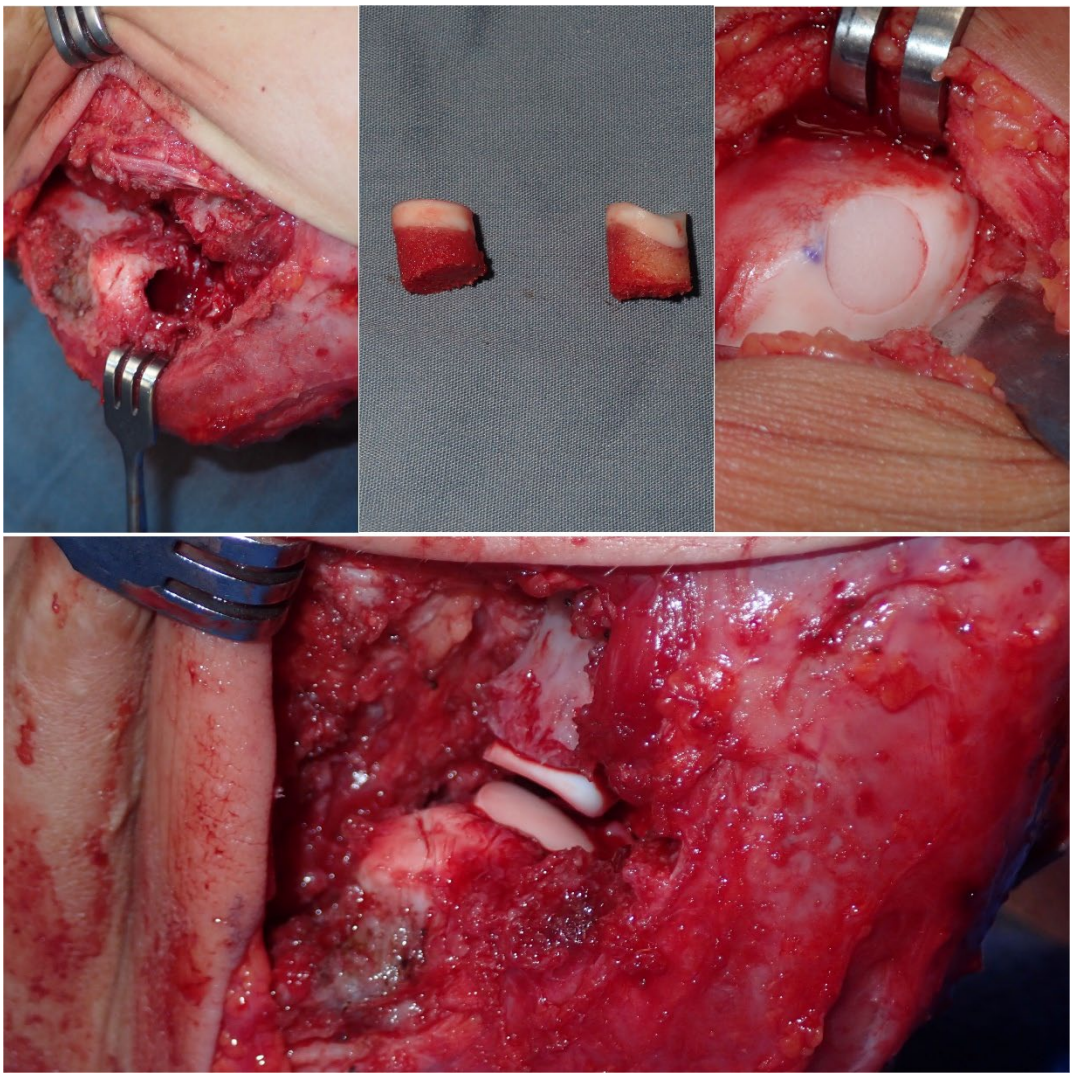
Figure 1. OATs technique