

Outcomes and Survivorship of Osteochondral Allograft Transplantation to the Humeral Head

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Background

- Glenohumeral Osteoarthritis is a common source of shoulder pathology, with humeral head osteochondral defects identified in up to 17% of patients undergoing arthroscopy.
- Defects can occur from a variety of etiologies, including anterior and posterior instability, osteochondritis dissecans, primary osteoarthritis, osteonecrosis, iatrogenic injury, and inflammatory arthropathies.
- First-line management is to trial conservative therapies, which often do not provide sustained relief and prompt surgical consultation.

Objectives

To evaluate survivorship, patient satisfaction, and long-term functional outcomes of osteochondral allograft (OCA) transplantation to the humeral head in patients with isolated focal chondral defects.

Outcome Assessment	Baseline Score	Final Follow- Up Score	P-value
SST, mean (SD)	46.88 (26.72)	70.83 (28.52)	0.032
ASES, mean (SD)	54.54 (22.13)	68.97 (27.58)	0.287
SF-12 Mental, mean (SD)	58.60 (5.26)	53.97 (11.47)	0.354
SF-12 Physical, mean (SD)	40.86 (7.55)	46.76 (10.38)	0.306

Table 1: Baseline and postoperative functional outcome assessments among the included cohort.

Methods and Results

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All patients receiving an OCA transplantation to the humeral head with a minimum follow-up of seven years were contacted for evaluation.

Evaluations consisted of patient reported satisfaction and pain levels, interval surgical history, sport outcomes, and standardized functional outcome assessments (Simple Shoulder Test (SST), American Shoulder and Elbow Surgeons Shoulder Score (ASES), and Short Form 12 (SF-12) Physical and Mental outcome assessments.

Treatment failures were defined as patients undergoing conversion to total shoulder arthroplasty (TSA)

Included in demographic and survivorship analysis but not outcome analysis due to crossover.

- 22 patients were identified in the study interval, of which 13 (59%) completed follow-up evaluation.
- Five patients (38.6%) failed treatment and underwent shoulder arthroplasty at an average of 3.91 ± 4.25 years (range 0.97-11.0 years) after OCA transplantation.
- Mean SST score was significantly improved at final follow-up when compared to baseline
- All other outcome assessments were improved to an insignificant degree at final follow-up.
- 3 patients (37.5%) were able to return to their pre-operative sport (1 collegiate, 1 competitive, and 1 recreational).



 All eight patients who did not undergo subsequent arthroplasty were participating in organized sports at the time of OCA transplantation: 4 collegiate athletes, 1 competitive athlete, and 3 recreational athletes.

 Patient satisfaction with surgical outcome varied, with 4 patients reporting extreme satisfaction, 1 with moderate satisfaction, 2 with somewhat satisfaction, and 1 patient reporting being unsatisfied with his procedure.

 The remaining eight patients were contacted and completed assessments at a mean follow-up of 12.0 ± 3.91 years (range 7.6-15.7 years) post-operatively.

- 4 Males : 4 Females
- Mean age 26.8 ± 10.2 years at time of surgery.

Conclusions

This small case series suggests that the reported short and mid-term outcome improvements of OCA transplantation to the humeral head may diminish at long-term time points.

A substantial proportion of patients ultimately have comparable outcomes to baseline and require conversion to shoulder arthroplasty.

Moreover, sport outcomes following OCA transplantation are unfavorable, with the majority of athletes unable to return to prior sport activities.



Figure 1: Intraoperative image of an implanted osteochondral allograft to the humeral head.

Limitations

Limited sample size given rarity of procedure.

Heterogenous patient presentations and indications for surgery.

Limited literature available to compare between studies.