

Osteochondral Graft Transplantation Leads to Variable Outcomes: A Systematic Review

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INTRODUCTION: Osteochondral lesions of the femoral head secondary to disease and injury are debilitating and can accelerate the development of end-stage arthritis if left untreated. Osteochondral autograft or allograft transplantation (OAT) or mosaicplasty have been used to surgically treat these defects in hopes of relieving symptoms and delaying total hip arthroplasty (THA). The aim of this study is to review current literature examining patient-reported outcomes (PROs) and survivorship in patients undergoing OATs and mosaicplasty of the femoral head.

METHODS: Pubmed, Cochrane, and Scopus were queried in November 2022 using the criteria established in the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) and the following keywords: (hip OR femoral head) AND (mosaicplasty OR osteochondral allograft OR osteochondral autograft OR osteochondral lesion). Articles were included if they evaluated PROs in patients who underwent OATs or mosaicplasty of the femoral head. Only the study with the largest number of patients from each institution was included to avoid overlapping patient populations. Case reports, opinion articles, review articles, and technique articles were excluded. Survivorship was defined as a non-conversion to THA. Forest plots for further statistical analysis were created for PRO's evaluated in three studies or more. The I² statistic was used to assess heterogeneity of studies.

RESULTS: Eleven studies were included in this review with a total of 145 hips and an average follow-up ranging between 16.8 months and 82.8 months. Seven studies included autograft cohorts while five studies included allograft cohorts. Four of the eleven studies calculated statistical significance between pre- and post-operative PRO's, with all four reporting significant improvement in at least one PRO. Seven studies reported survivorship rates, which ranged from 57.1 % to 96% at varying follow-up timeframes.

DISCUSSION: The primary finding of this review was that patients with femoral head osteochondral lesions reported favorable postoperative outcomes with varying survivorship rates following osteochondral autograft/allograft transplantation or mosaicplasty. In addition, a variety of surgical techniques, approaches, graft types and graft quantity were employed across the studies, showcasing a diverse array of interventions. Despite a lack of calculations for statistical significance in the majority of studies reviewed, there was marked improvement in PRO scores across all six studies that reported both pre- and postoperative PROs. In summary, the OAT procedure for treatment of osteochondral lesions shows promise for outcomes at short- to mid-term follow-up. However, more research is needed to better understand its long-term impact and reasons for failure.

One limitation to this study is that all studies used were LOE IV resulting in increased risk of bias. Second, the studies in this review mostly used different PROs from one another. The most commonly used PRO, HHS, was used in only five of the included eleven studies. The lack of consistent and similar outcome measures limits the ability to directly compare studies. Third, this review does not account for differences and advances in surgical techniques/approaches across its large range of study periods.

SIGNIFICANCE/CLINICAL RELEVANCE: Patients with osteochondral lesions of the femoral head that undergo osteochondral autograft and allograft transplantation or mosaicplasty procedures demonstrate improved patient-reported outcomes with variable survivorship rates.