Outcomes and Survivorship of Vascularized Fibular Grafting for Post-Traumatic Osteonecrosis of the Femoral Head

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Purpose: Posttraumatic osteonecrosis of the femoral head (ONFH) is a challenging condition to treat in the young patient. Free vascularized fibular grafting (FVFG) is a well-recognized method of treatment for these patients; however, there is a paucity of literature evaluating the long-term outcomes and survivorship of FVFG performed specifically for posttraumatic ONFH. The purpose of this study was to evaluate the longevity of FVFG in traumatic injuries resulting in ONFH, with conversion to total hip arthroplasty (THA) as the primary outcome. Secondary aims included evaluation of outcome scores. Our hypothesis was that patients who received FVFG for posttraumatic ONFH would have a low overall conversion rate to arthroplasty and have clinically significant improvement in Harris hip (HH) scores.

Methods: Patients with a minimum of 5-year follow-up were retrospectively identified from our institutional database for having undergone FVFG from 1980 to 2006 for posttraumatic ONFH. Posttraumatic indications for FVFG were grouped as: (1) ONFH after fixation of femoral fractures involving the head, neck, or peritrochanteric region; (2) ONFH after dislocation without femoral fracture; (3) ONFH after trauma without fracture or dislocation; or (4) chronic nonunion correction after femoral neck fracture. Data collected included demographics, preoperative disease stage, HH scores, Short Form (SF)-12 scores, and conversion to THA.

Results: 72 hips in 68 patients with a mean age at surgery of 27.8 years (range, 11.5-50.5) met inclusion criteria. Mean follow up was 11.6 years (range, 5.1-33.2). Etiology included femoral neck fracture in 36 patients (61%), hip dislocation in 7 (12%), trauma without fracture or dislocation in 11 (19%), and femoral neck nonunion in 4 (8%). The most common stage at presentation was stage IV (n = 48 patients), followed by stage II (n = 11), stage III (n = 9), and stage I (n = 4). Graft survival at final follow-up (mean 10.9 years) was 64%, with mean time to conversion to THA in those that did not survive (36%) occurring at 8.4 years. There was no difference between THA conversion rates in hips with pre-collapse (stage I and II) versus impending or post-collapse (stage III or IV) lesions ($P = 0.227$). In hips with surviving grafts at final follow up, mean HH scores improved from 56.7 to 77.3 (standard deviation 24.57, range 69-93), a mean improvement of 20.6 ($P<0.001$).

Conclusion: Our results reveal an acceptable overall conversion rate to THA of 36% at 8.4 years with no difference in conversion rate between stages, and significant postoperative improvement in HH score. FVFG remains a viable option for treatment of posttraumatic ONFH in young patients with both pre- and post-collapse lesions.

The FDA has stated that it is the responsibility of the physician to determine the FDA clearance status of each drug or medical device he or she wishes to use in clinical practice.