Sesamoidectomy for Autografting in First Metatarsophalangeal Joint Arthrodesis
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Introduction/Purpose: Arthrodesis of the first metatarsophalangeal (MTP) joint is a well established procedure with excellent outcomes for patients with forefoot disorders including hallux rigidus and hallux valgus. Routine bone grafting is not typically required, but bone graft may be necessary in the setting of revision surgery, non-union, or erosive bone loss to encourage biologic fusion and fill bone voids. Options for bone graft include either allograft or autograft. Typical locations for autograft harvesting would include calcaneus, distal tibia, or iliac crest. Due to potential harvesting morbidity and time associated with an extra incision, allograft bone is frequently utilized. In this study, we describe the outcomes of an approach to first MTP fusion with simultaneous medial sesamoidectomy with morselizing the bone for utilization as autograft.

Methods: A retrospective review of all first MTP arthrodesis cases performed by one fellowship-trained foot and ankle surgeon were identified. Operative reports and radiographs were reviewed identifying patients that underwent simultaneous medial sesamoidectomy for autograft purposes. Routine bone graft was not typically used for primary first MTP fusion. In the setting of nonunion surgery, revisions, or bone loss, autograft bone was harvested as needed to facilitate fusion. Medial sesamoidectomy was performed via the same dorsal approach without use of an additional incision. The bone was morselized and used to fill voids within the first MTP as needed. Supplemental calcaneal autograft was harvested if the harvest was not adequate (i.e. substantial bone voids). Indications for sesamoidectomy harvesting were noted. The primary outcome reviewed was fusion rate. Overall nonunion rates and patient outcomes were collected and compared between those undergoing sesamoidectomy for grafting and those undergoing standard procedure arthrodesis.

Results: During the study period, 74 patients underwent first MTP arthrodesis. Of these, 20 underwent concurrent sesamoidectomy grafting with 11 requiring additional calcaneal grafting. Of the 20, 16 had prior surgeries and 4 had extensive erosive arthritis requiring grafting. Indications for the sesamoidectomy group included 5 primary cases of erosive hallux rigidus, 2 cases of hallux valgus, 3 nonunions, 3 failed Cartiva implants, 2 cases of avascular necrosis, 3 failed arthroplasties, 1 conversion bunionectomy, and 1 conversion from Keller procedure (Table 1). All 20 patients went on to successful union. In the non-sesamoidectomy group the fusion rate was 92.6% (p=0.57). All patients in the sesamoidectomy group were satisfied with their surgical outcome, and no revisions were required.

Conclusion: This study found highly successful fusion rates in a potentially higher risk population (i.e. bone loss and revision cases) with the use of local autografting from the medial sesamoid. The medial sesamoid serves as a cost-effective, freely-available, successful graft material for first MTP arthrodesis that can be done quickly via the same incision, reducing potential need for other painful donor sites and the cost associated with allograft. This technique can be particularly useful in the context of revision arthrodesis, failed implants with conversion to arthrodesis, and in arthrodesis with osteoporotic bone or cases with significant erosive arthritis.
| Indication for Sesamoidectomy Graft                  | Number of Cases |
|----------------------------------------------------|-----------------|
| Hallux Rigidus with Bone Loss                      | 5               |
| Hallux Valgus with Bone Loss                       | 3               |
| Nonunion First MTP                                 | 3               |
| Failed Cartiva Implant                             | 3               |
| Avascular Necrosis                                 | 2               |
| Failed Arthroplasty                                | 3               |
| Conversion of Keller                               | 1               |