Is This Autograft Worth It? The Blood Loss and Transfusion Rates Associated with RIA Bone Graft Harvest

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Purpose/Background: The previous decade has witnessed the emergence of the reamer-irrigator-aspirator (RIA) as a widely used method of bone graft harvest. The literature is sparse regarding complications associated with RIA. One small series focused on donor-site morbidity compared to conventional methods such as anterior or posterior iliac crest. To date no papers have examined the rate of blood loss or transfusion in a group larger than eight patients. We hypothesized that the hematocrit drop and transfusion rates after RIA harvest would be much greater than historical controls for iliac crest bone graft harvest since the RIA technique attaches suction directly to the intramedullary canal.

Methods: We conducted a retrospective chart review of all patients who underwent RIA bone graft harvest from January 2008 to December 2014. A search of our electronic record system yielded 65 patients who underwent RIA autograft harvest. Demographic information, date of surgery, indication for surgery, type of surgery, preoperative hematocrit (HCT), postoperative HCT, transfusion rate, reported intraoperative blood loss, reported volume of graft harvested, and other major complications were recorded.

Results: A total of 61 (94%) patients were included in the study as there were insufficient preoperative data to include 4 patients. Mean patient age was 51 years (range, 18-80), with 32 males and 29 females. The most common indications for an RIA was tibial nonunion (51%) followed by femoral nonunion (39%), ankle fusion (8%), and bilateral calcaneal nonunions (2%, one case). The femur was used for graft harvesting in 49 cases with the tibia being used in the remaining 12 cases. The amount of harvested bone graft was reported in 40 cases and averaged 53 mL (rang,e 30-100 mL). The mean HCT drop postoperatively was found to be 13.7 (range, 4.1-27.4) with operative reports documenting a mean estimated blood loss (EBL) of 674 mL (range, 100-2000). EBL was noted to be much higher than historical data that suggest EBL with Iliac crest bone grafting ranges from 336 mL to 371 mL. A total of 27 patients (44%) required a blood transfusion for a mean postoperative HCT of 22.0. The majority of those transfused received two units of packed red blood cells (range 1-4 units). There were no documented cases of iatrogenic fracture or fat emboli syndrome.

Conclusion: This series demonstrated that 44% of patients undergoing RIA bone graft harvest required transfusion, with a mean hematocrit drop of 13.7 across all subjects. This is certainly significantly higher than the risk of transfusion associated with iliac crest harvest. The EBL intraoperatively, which is widely acknowledged as a very unreliable estimate, was also greater than double that of historical controls for iliac crest. Given the likelihood of blood transfusion, risks associated with this must be factored into the decision to utilize RIA for the harvest of autogenous bone graft.