
February 14, 2020

More Evidence of the Low Morbidity Associated with Contemporary Anterior Iliac Crest Bone Harvesting

James Francis Marino

Orthopedist/surgeon inventor

Managing Partner, Trinity Orthopedics, LLC

While this article's primary outcome indices were intended to evaluate the performance of an in situ curing biphasic calcium salt bone graft substitute versus iliac crest autograft in the clinical setting of acute tibial plateau fractures (with a finding of non-inferiority), it struck me that this study provided additional evidence of the relatively low morbidity associated with iliac crest autologous bone graft harvesting, utilizing contemporary surgical techniques (1). The article reported on a prospective multicenter study of 135 patients surgically treated (twenty facilities in Germany) for displaced (depressed) tibial plateau fractures into two cohorts, one treated with ORIF and harvested ipsilateral anterior iliac crest bone (technique described by Shaw et al [2]) and the other with a biphasic hydroxyapatite and calcium sulfate cement (CERAMENT Bone Void Filler [CBVF], produced by Bone Support, financed the study). Patient reported clinical outcomes (VAS interval values, SF-12 physical and mental component scores) and radiographic outcomes (articular displacement and consolidation) during the 26 weeks of the study were very similar for the two cohorts. The authors also reported on surgical times, estimated blood loss, and complications.

The iliac crest bone harvesting cohort surgical time averaged 8 minutes longer than the biphasic calcium salt cohort (112 minutes \pm 42 min. versus 104 \pm 36 min.) and there reported blood loss was 196 \pm 160 mL in the ICBG versus 109 \pm 110 mL in the CBVF cohort. Adverse events or complications were detailed in Table VII of the article and while numerous potential complications of medical and surgical management were enumerated, only one wound site infection was recorded in either cohort (in the 62 patients in each cohort that completed the study).

While the authors are clearly inclusive in describing the historically reported complication rate for autologous iliac crest bone graft harvesting (0.76% to 39% in the 5 articles cited), I believe it is misleading and a disservice to the readers, to suggest that these articles are relevant to the study as conducted and to contemporary surgical techniques utilized in iliac crest bone harvesting. Two of the anterior iliac crest harvesting articles referenced were for anterior cervical fusion (most often a bi-cortical or tri-cortical

graft), and the other three articles represent a surgical technique review and two systematic review articles that include varied surgical techniques and historical references (noncontemporary citations).

A more relevant article, conspicuously not cited by the authors, was published in this same journal in 2012, by Loeffler et al. (3), “Prospective Observational Study of Donor-Site Morbidity Following Anterior Iliac Crest Bone-Grafting in Orthopaedic Trauma Reconstruction Patients”. This study of 92 patients found a donor site complication rate (2%) comparable to that found in this study (<2%), even though it included some cortical cancellous grafts (inner table with minimal soft tissue stripping). A Commentary and Perspective written by Thomas A. DeCoster M.D. (4), that emphasized the disparity between the low donor site morbidity (2% at one year of non-debilitating pain) and the relatively high rates published within twenty years of his commentary (i.e. 15% to 25%).

It is no accident that the popularity of bone graft substitutes of various kinds have been accompanied by the commercially sponsored publication of articles that include references to historically high complication rates from autogenous iliac crest bone harvesting, associated with less relevant surgical techniques. These antiquated surgical techniques included muscle and soft tissue stripping, as well as cortical stripping and table defect generating techniques, that have little relevance to contemporary soft tissue sparing and cortical integrity preserving techniques. These characterizations serve to malign autologous bone graft harvesting, consequent discouraging of surgeons from considering its use in their patients, even though its relatively effective use for a wide variety of applications has been reported in published orthopedic journal articles for more than 100 years. By implication, this (I believe misleading) characterization, has promoted the use of alternative bone graft materials, many of which have little published clinical evidence for clinical efficacy, and even less evidence to justify their sometimes considerable costs.

Disclaimer: e-Letters represent the opinions of the individual authors and are not copy-edited or verified by JBJS.

References

- 1) Hofmann, A; Gorbulev,S., Guehring, T.; Schulz, A. Autologous Iliac Bone Graft Compared with Biphasic Hydroxyapatite and Calcium Sulfate Cement for the Treatment of Bone Defects in Tibial Plateau Fractures JBJS 2020; 102-A, No 3 179 – 93
- 2) Shaw KA, Griffith MS, Shaw VM, Devine JG, Gloystein DM. Harvesting autogenous cancellous bone graft from the anterior iliac crest. JBJS Essent Surg Tech. 2018 Jul 11;8(3):e20
- 3) Loeffler, B., Kellam, J., Sims, S., Bosse, M. Prospective Observational Study of Donor-Site Morbidity Following Anterior Iliac Crest Bone-Grafting in Orthopaedic Truama Reconstruction Patients. JBJS 2012; 94: 1649-54
- 4) DeCoster, T. Low Morbidity Reported After Iliac Bone-Graft Harvesting, Commentary & Perspective, JBJS 2012;94e139 (1-2)

Conflict of Interest:

Disclosure: The author did not receive any payment or services, either directly or indirectly (I.e. via his institution), from a third party in support of any aspect of this work. He does however have a financial interest and executive position in a company that manufactures, distributes, and sells a percutaneous autologous bone harvesting instrument (Corex™ Autologous Bone Harvester, Trinity Orthopedics, LLC, San Diego, CA).