Autologous bone graft is frequently utilized in orthopedic surgery. In foot and ankle surgery, it is most commonly used in arthrodesis and repair of non-unions. While the iliac crest has historically been the most common graft donor site, foot and ankle surgeons have exploited other sites that are in anatomic proximity and may avoid the complications associated with iliac crest harvest. These include the calcaneus as well as the proximal and distal tibia.

These donor sites, however, are not equal with regard to osteogenic cellularity. In our histologic study comparing samples of bone graft harvested from iliac crest and proximal tibia, only the iliac crest grafts contained active hematopoietic marrow. In marked contrast, the tibial grafts contained quiescent fat and little hematopoietic marrow. Similarly, Hyer et al. recently demonstrated that marrow aspirate collected from the iliac crest had a higher concentration of mesenchymal stem osteoprogenitor cells than aspirates from the distal tibia or the calcaneus.

These findings have important ramifications regarding the cellular contributions to bone healing in foot and ankle reconstructive procedures. Clinically, they favor the use of hematopoietic iliac crest graft or aspirate, at least in patients with high risk for non-union. Alternatively, the finding that tibial autograft is largely devoid of hematopoiesis may support the view that viable autograft is unnecessary in primary foot and ankle procedures and can be replaced by allograft cancellous bone, where the osteoconductive property may be sufficient for bony union.

References
