**The Use of a Novel Moldable Calcium Phosphate Putty (Montage) for Periarticular Fractures: Early Clinical Results**

***Omar Hammad Atassi, MD***; *Gennadiy Busel, MD; Guadalupe De La Fuente, MD; David Donohue, MD; Benjamin Maxson, DO; Anjan Rajni Shah, MD; David Timothy Watson, MD; Anthony F. Infante, DO; Katheryne Downes, MPH, PhD; Roy W. Sanders, MD; Hassan Riaz Mir, MD, MBA, FACS*
*Florida Orthopaedic Institute, Tampa Bay, FL, United States*

**Purpose:** Metaphyseal voids are commonly encountered with periarticular fractures. Calcium phosphates have been used to provide structural support and promote bony union. Most commercially available calcium phosphates come in an injectable paste form, and their handling characteristics, setup time, and ability to be instrumented can make them challenging in clinical use. A novel moldable calcium phosphate putty (Montage, Abyrx Inc) provides these advantages in its clinical application. The goal of this study is to report on the early clinical results of Montage in managing metaphyseal voids associated with periarticular fractures.

**Methods:** A retrospective review was conducted on patients >18 years of age with periarticular fractures with an associated metaphyseal void filled with Montage in combination with open reduction and internal fixation. Patients with pathologic fractures or those in which Montage was used in combination with other bone grafts were excluded. Demographics and injury characteristics were collected. Fractures were classified using the OTA classification. Radiographs were reviewed for extravasation into the soft tissue or joint, articular subsidence, and incorporation and resorption of Montage. Charts were reviewed for clinical and radiographic union and wound complications. Descriptive statistics were utilized.



**Results:** 41 patients met the inclusion criteria. Fracture distribution was as follows: 23 plateau, 6 pilon, 5 acetabulum, 4 calcaneus, 1 midfoot, 1 olecranon, and 1 distal radius. 25 patients currently have >6-month follow-up. All fractures have united. There were no instances in which the Montage extravasated into the soft tissue or joint. 22 of 25 patients (88%) demonstrated articular subsidence <2 mm. 24 of 25 (96%) showed radiographic evidence of incorporation and partial resorption. There were 2 unplanned surgeries (8%). One patient had an open pilon fracture that underwent debridement and implant removal at 4 months for deep infection, and 1 patient with a tibial plateau fracture underwent debridement with implant retention at 4 weeks for deep infection. Both went on to clinical and radiographic union.

**Conclusion:** Montage shows excellent efficacy in preventing articular subsidence when used as a metaphyseal void filler with fixation of periarticular fractures. There is strong radiographic evidence of incorporation and partial resorption at early clinical follow-up. The handling characteristics during its application showed no soft tissue or intra-articular extravasation. Early clinical results are promising and further study is warranted.

See the meeting app for complete listing of authors' disclosure information.