

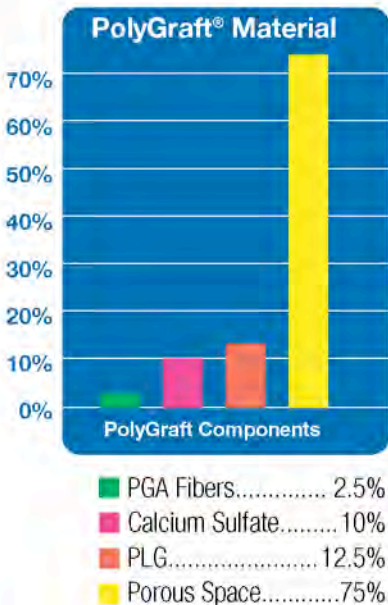
## CLINICAL CASE

# The Use of OsteoCure™ Composite Plugs for Treating Bone Defects in the 1st MTPJ



FIGURE 1: MRI

FIGURE 2: PolyGraft® Material



**Surgeon: Gary M. Lepow, DPM, MS, FACFAS, Clinical Associate Professor, Baylor College of Medicine; University of Texas Medical School-Houston**

A 55 year old female presented with bilateral pain in the 1st MTPJ. She denied any history of trauma or treatment for arthritis. The past medical history and review of symptoms were unremarkable other than the area of chief complaint. Examination revealed pain and crepitus with significant limitation of range of motion of the 1st MTPJ. Foot and ankle radiographs revealed subchondral erosive changes with dorsal osteophytic lipping of the 1st metatarsal head.

Conservative care including intra-articular steroid injections, physical therapy, NSAIDS's, off-loading pads and orthotics were unsuccessful in decreasing her symptoms. An MRI revealed moderately advanced change of osteoarthritis of the 1st MTPJ consisting of 2-3 mm foci of grade III-IV chondromalacia with subcortical bone marrow edema and sclerosis, as well as subchondromalacia cyst formation at the insertion of the capsule. Additionally, capsulitis was present and an intermetatarsal bursitis was found within the first intermetatarsal space. (Figure 1: MRI)

The findings were reviewed with the patient and she consented for a cheilectomy, synovectomy, and possible chondroplasty with insertion of OsteoCure™ Plugs in the first metatarsal head.

## INTRODUCTION

Engel et al. reported on Hallux Valgus and cartilage degeneration of the 1st MTPJ in the British JBJS in 2004 <sup>1</sup>. They retrospectively examined 265 1st MTPJs of 195 patients with a mean age of 54.2 years for the existence of cartilage lesions. 73.2% of the population had cartilage lesions, and there was a statistically significant correlation found between the grade of the cartilage and the Hallux Valgus angle.

OsteoCure™ PolyGraft® composite plugs are 75% porous implants composed of a PLA and PGA co-polymer serving as a scaffold, and calcium sulfate for enhancing bone growth. (Figure 2: PolyGraft® Material) In the past, microfracture marrow stimulating techniques (MST) were utilized to violate the subchondral bone allowing marrow with stem cells to migrate to the surface for repair. Unfortunately, these open defects were exposed to the synovial fluid which could lead to cysts. The OsteoCure™ Plugs provide a protected, structural scaffold for the repair to occur.

Studies utilizing the OsteoCure™ Plugs on adult Spanish goats revealed successful restoration of bone and cartilage confirmed by both gross observation and histological biopsy <sup>2</sup>.

## CLINICAL CASE CONTINUED

# The Use of OsteoCure™ Composite Plugs for Treating Bone Defects in the 1st MTPJ



FIGURE 3: Defect



FIGURE 4: Drill Sleeve



FIGURE 5: Delivery device



FIGURE 6: Plug

## SURGICAL TECHNIQUE

The patient was prepped and draped in the usual sterile manner after IV sedation and a Mayo Block. After elevation of the tourniquet, a standard dorsal medial incision was made followed by a capsulotomy. All hypertrophic bone and synovium were resected. The cartilage of the 1st MTPJ was inspected for damage which corresponds to that observed by preoperative MRI and X-ray. Adjacent to the cartilaginous defect was a “Zone” of discoloration which was softer than the surrounding cartilage. **(Figure 3: Defect)** The defect and “Zone” were measured with the sizer instrument to determine the exact diameter. The corresponding color-coded drill sleeve with matching cap was inserted into the defect taking care to ensure the drill sleeve is positioned perpendicular to the surface. **(Figure 4: Drill Sleeve)** Using a mallet, the drill sleeve was driven into the defect to a minimum depth of 5 - 8mm. The appropriate OsteoCure™ drill was then utilized to remove bone and tissue from the affected area. The corresponding OsteoCure™ Plug delivery device with the preloaded PolyGraft® implant material was measured for length, the excess was trimmed and the plug was press-fit into the defect. **(Figure 5: Delivery device)** Note: The implant, which is tamped smooth, must be flush with the surrounding tissue. **(Figure 6: Plug)** Range of motion is checked and closure performed.

## Post-Operative Course

The patient underwent successful surgery and began active and passive 1st MTPJ range of motion exercises on the day of surgery and continued three times daily for two weeks. A surgical boot was utilized for 3 weeks. The patient experienced minimal post operative discomfort and had a 70% increase in pain-free range of motion by the 4th week compared with pre-operative examination.

- 1) A. Engel, PhD et al, *Hallux Valgus and Cartilage degeneration in the 1st MTPJ*. JBJS British 2004
- 2) Niederauer GG, Leatherbury NC, Simon TM, Aberman HM. *Treatment of Osteochondral Autograft Donor Sites Using Porous, Biodegradable Scaffolds*, 2004 International Cartilage Repair Society Symposium, May 26-30, 2004.

OsteoCure™ Composite plugs are cleared by the FDA as a bone void filler. The OsteoCure™ Composite implant is intended to be used to fill bony voids or gaps caused by trauma or surgery that are not intrinsic to the stability of the bony structure. These defects may be surgically created osseous defects or created from traumatic injury to the skeletal system, spine and pelvis.

“Nota Bene: The technique description herein and the use of instructions for the related procedures are made available by Nexa Orthopedics to the healthcare professional to illustrate the author’s suggested treatment for the procedure. In the final analysis, the preferred treatment is that which, in the health care professional’s judgement, addresses the needs of the individual patient.”



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