

A collage of various X-ray images showing different orthopedic procedures and implants. The images are arranged in a grid-like pattern and are rendered in grayscale. The collage is positioned in the middle of the page, between the blue band and the lower 3D model.

CERAMENT® BONE VOID FILLER
Image Library



CERAMENT® | BONE VOID FILLER

CERAMENT® is an injectable, moldable, drillable and radiopaque bone substitute which provides rapid and complete bone remodeling within 6-12 months^{1,2,3}.

Unique features:

- **Injectable, Moldable, Drillable**^{1,2,3}
- **Rapid and complete bone remodeling**^{1,2,3}
- **Highly visible under fluoroscopy**²
- **30 second, enclosed mix**
- **Not temperature sensitive**
- **Non-exothermic**
- **Robust clinical data**

Reconstructive Orthopedics

- Revision Hip Arthroplasty
- Revision Knee Arthroplasty
- Revision Shoulder Arthroplasty - Glenoid
- Backfill Hardware Removal

Trauma

- Tibial Plateau FX
- Distal Femur FX
- Distal Radius FX
- Proximal Humerus FX

Foot & Ankle

- Calcaneal FX
- Arthrodesis
- Charcot Foot
- Calcaneal Cysts
- Backfill Hardware Removal

Ortho-Oncology

- Benign Bone Tumors and Cysts
- UBC, ABC and Enchondroma

REFERENCES

1. Svacina. Case Reports in Orthopedics Volume 2016, Article ID 4160128.
2. Kaczmarczyk et al. BMC Musculoskeletal disorders (2015) 16:369
3. Abramo et al. J Biomed Mater Res Part B: Appl Biomater 92B: 281–286, 2010.



THE PROBLEM

TRAUMA



Pre-op radiograph of proximal humerus fracture¹

RECONSTRUCTIVE ORTHOPEDICS



Pre-operative acetabular fracture²

BONE CYST



Pre-operative lateral radiograph of calcaneal bone cyst³

THE SOLUTION

TRAUMA



Intra-operative ap radiograph showing placement of **CERAMENT®|BONE VOID FILLER**¹



Radiograph at 12 months post-op demonstrates fracture healing with remodeling of **CERAMENT®|BONE VOID FILLER** into trabecular bone¹

RECONSTRUCTIVE ORTHOPEDICS



Acetabular revision surgery - intra-op image utilizing **CERAMENT®|BONE VOID FILLER**²

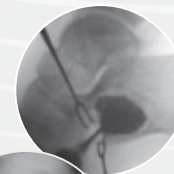


At 12 months - bone remodeling and hip mobility observed radiographically²

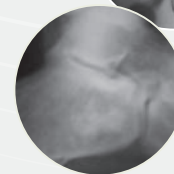


At 32 months - bone remodeling and hip mobility observed radiographically²

BONE CYST



Intra-operative percutaneous replacement of bone void with **CERAMENT®|BONE VOID FILLER**³



24-month post-operative lateral radiograph demonstrating complete incorporation by bone³

REFERENCE IMAGES REPRODUCED BY KIND PERMISSION OF:

1. Dr. M. Van Der Elst, Reinier de Graaf Hospital, Delft, The Netherlands
2. Dr. J. Svacina, Bodden-Kliniken Ribnitz-Damgarten, Germany
3. Dr. L. DiDomenico, Adjunct Professor, Ohio College of Podiatric Medicine, Youngstown, Ohio, USA

CERAMENT®|BONE VOID FILLER in Reconstructive Orthopedics

Hip Revision

A 61-year old male with a history of well-positioned, well functioning bilateral uncemented THAs presented with progressive left hip pain over 6 months.

X-rays showed a large cystic osteolytic lesion in the left acetabulum involving the superior dome and the medial wall with extension into the ischium. CT scan confirmed extensive amount of osteolysis.

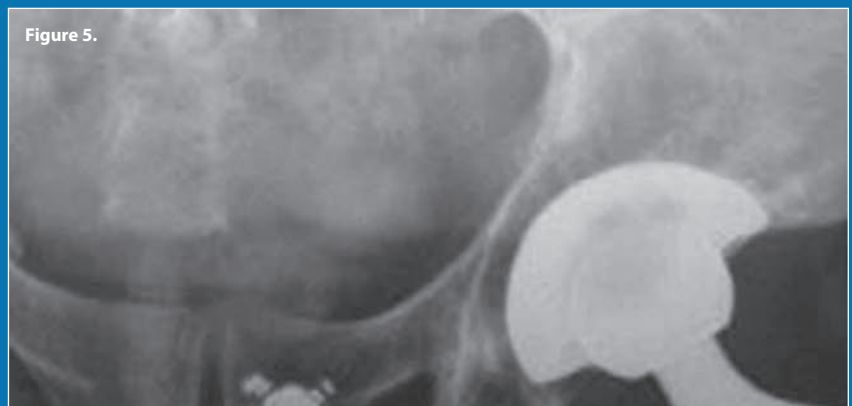
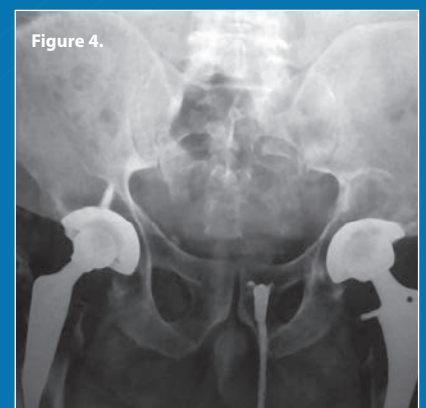
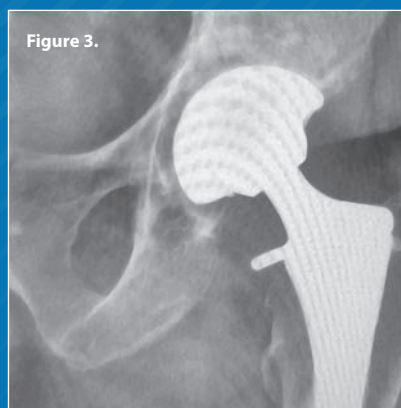
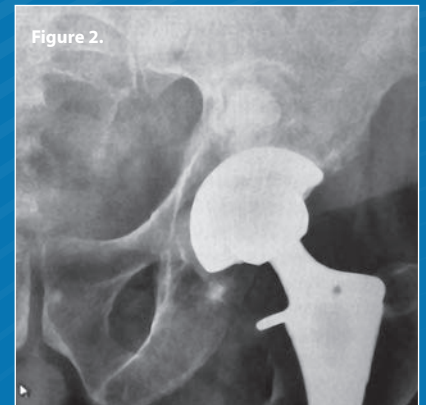
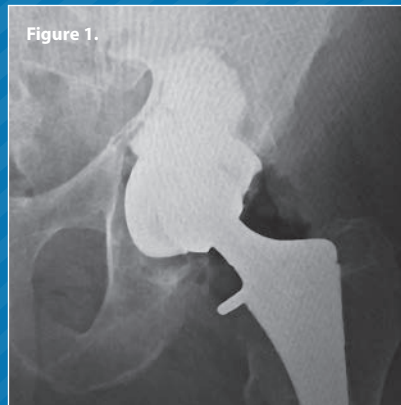
Intraoperatively, significant wear of the polyethylene liner allowing subluxation of the femoral head was found. The cup was solidly fixed and was not revised. The femoral head was exchanged for a new 32 mm head and the liner was exchanged to a 10-degree elevated lip liner.

A 2x2cm window was made above the acetabulum at the level of the cyst.

The cyst was curetted and filled with 32cc CERAMENT®|BONE VOID FILLER (Fig. 1). Once CERAMENT® had set, the wound was irrigated and closed.

At 6 weeks post-op, the patient had good and painless range of motion and was weight-bearing without aides. X-rays confirmed good positioning of the acetabular implant CERAMENT® is still visible (Fig. 2). At 11 weeks post-op, CERAMENT® is no longer visible (Fig. 3).

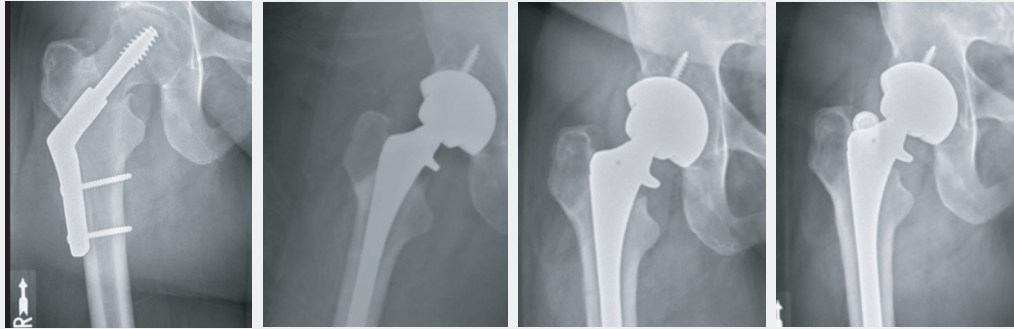
At 8 months post-op, the patient was doing well and was pain-free. X-rays demonstrated CERAMENT® to be nearly completely resorbed and replaced with new cancellous bone (Figs. 4 & 5).



Reference:

Thomas Baier, M.D.
Advocate Condell Medical Center, Libertyville, IL USA

Right Hip Hardware Removal¹



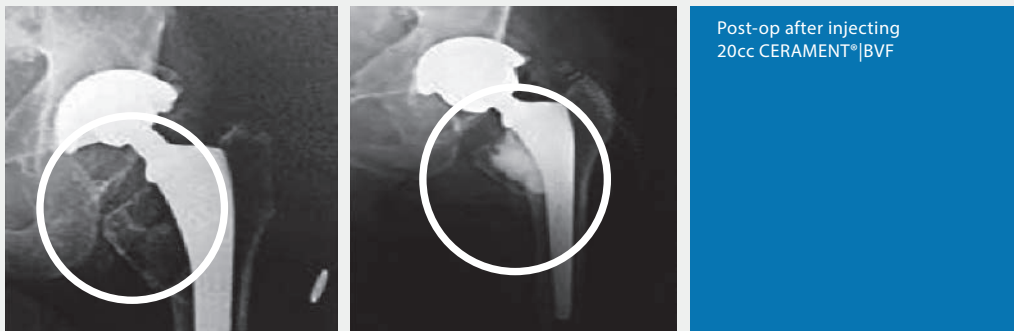
Pre-op

Immediate post-op

3 month post-op

1.5 year post-op. CERAMENT has completely incorporated and bone stock has reconstituted.

Hip Head and Liner Replacement²

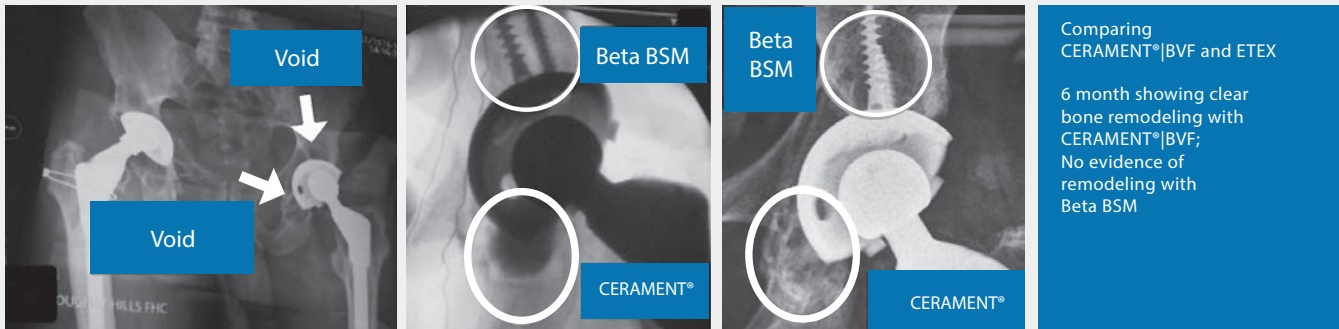


Pre-op

Immediate post op

Post-op after injecting
20cc CERAMENT®|BVF

Hip Revision Comparing CERAMENT® to a Beta BSM product³



Pre-op

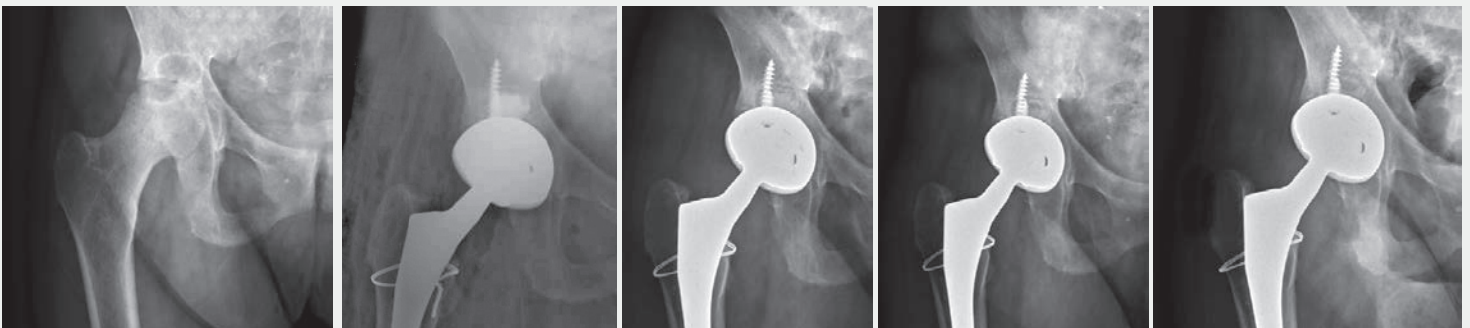
Intra-op

6 month post-op

Comparing
CERAMENT®|BVF and ETEX

6 month showing clear
bone remodeling with
CERAMENT®|BVF;
No evidence of
remodeling with
Beta BSM

Avascular Necrosis and Osteoarthritis⁴



Pre-op

Immediate post-op after
injecting 10 cc of CERAMENT®

6 week follow up

3 month follow up

6 month follow up CERAMENT®
completely incorporated and
bone stock reconstituted

1. Donald Sullivan, MD, Decatur, IL. 2. Shahan Yacoubian, MD, Burbank, CA. 3. Nathan Mesko, MD, Cleveland, OH. 4. Donald Sullivan, MD, Decatur, IL.
CERAMENT BONE VOID FILLER can be used in the pelvis for acetabular revision only.

CERAMENT®|BONE VOID FILLER

In Trauma

Bicondylar Osteoporotic Tibial Plateau Fracture

A female (88 years old) underwent open reduction and internal fixation of angulated, impacted, displaced and unstable left tibial plateau bicondylar fracture, with percutaneous lateral plate application.

CERAMENT®|BONE VOID FILLER was injected to fill resulting void after fracture reduction. Fig A & B.

At 18 months patient was clinically improved and ambulating well.

Radiographs showed remodeling of CERAMENT®|BONE VOID FILLER into new bone. Fig C & D.



Figure A. Intra operative anterior-posterior radiograph placement of CERAMENT®|BONE VOID FILLER



Figure B. Intra operative lateral radiograph placement of CERAMENT®|BONE VOID FILLER

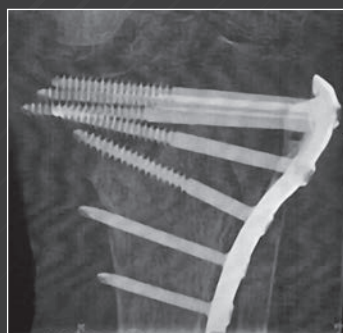


Figure C. At 18 months anterior-posterior radiograph demonstrating excellent incorporation of CERAMENT®|BONE VOID FILLER into new bone.

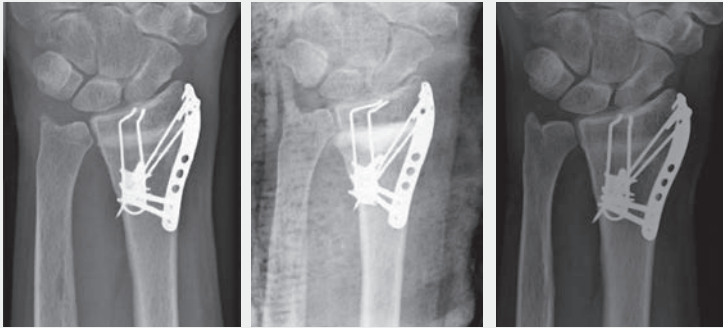


Figure D. At 18 months lateral radiograph demonstrating excellent incorporation of CERAMENT®|BONE VOID FILLER into new bone.

Reference:

Thomas Baier, M.D.
Advocate Condell Medical Center, Libertyville, IL USA

Osteotomy of Distal Radius Fracture Malunion¹



3 month post-op

Immediate post-op showing CERAMENT®|BVF under fluoroscopy

12 month post-op

Humeral Head Fracture²

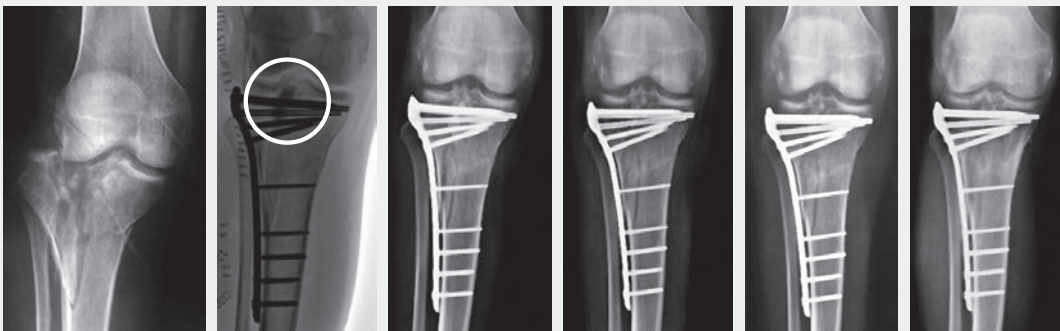


Pre-op

Treated with 10 cc of CERAMENT®|BVF

At one year bone remodeling is demonstrated

Tibial Plateau Fracture Dx (AO; C3) 32 year old³



Pre-op

Pre-op

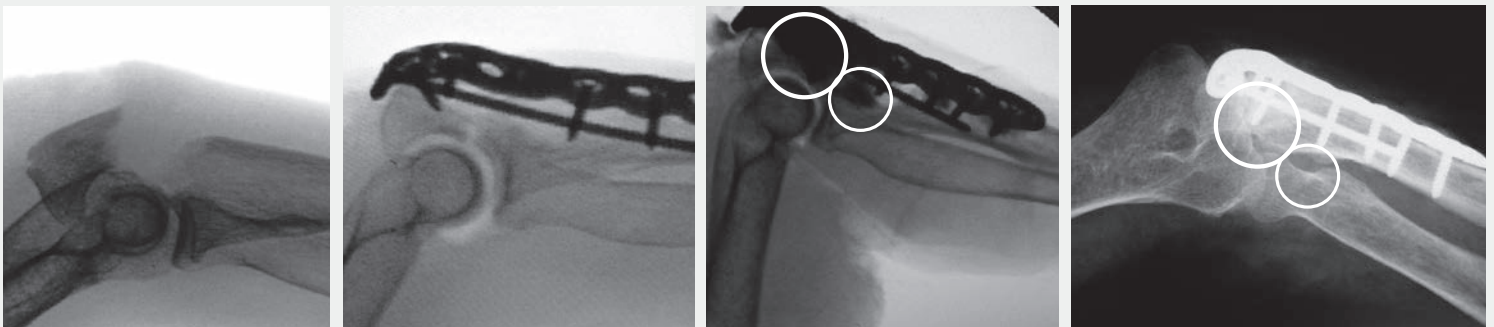
1 month post-op

3 month post-op

6 month post-op

12 month post-op

Elbow (Olecranon)⁴



Pre-op

Hardware without CERAMENT®

Intra-op with CERAMENT®

3 month post-op with clear visibility of early bone remodeling

CERAMENT®|BONE VOID FILLER in Foot and Ankle

Treatment of displaced intra-articular calcaneal fracture

A female (54 years old) with a displaced intra-articular calcaneal fracture had open reduction and internal fixation (ORIF) (Fig. A & B). The resulting bone void after fracture reduction was filled with CERAMENT®|BONE VOID FILLER. (Fig. C & D)

After 45 days, the iohexol has washed out and early bone formation is seen (Fig. E & F).

Removal of the plate at 5 months due to pain (no signs of infection) facilitated a bone biopsy which showed early signs of new bone growth where CERAMENT® was implanted (Fig G).

The patient demonstrates a good result and is fully weight-bearing. (Fig. H & I).



Figure A & B. Pre-op radiographs



Figure C & D. Immediate post-op



Figures E & F. At 45 days, iohexol has washed out

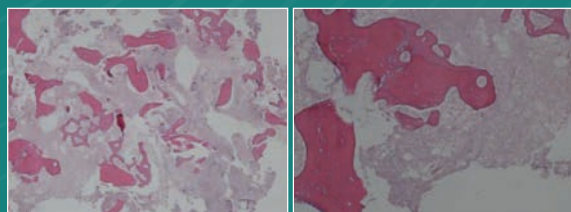


Figure G. 5 month Histology

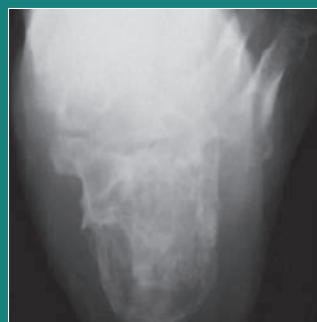


Figure H & I. 5 months after surgery and with the plate removed, radiological bone healing is demonstrated

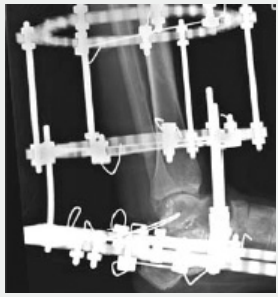
Reference:

Damiano Papadia
Reperto di Ortopedia e, Traumatologia Ospedale, Santa Chiara, Trento, Italy

Calcaneal Non-Union and Sub-Talar Joint Arthrodesis from a Calcaneal Fracture with Arthrodesis¹



Radiograph of the non-union

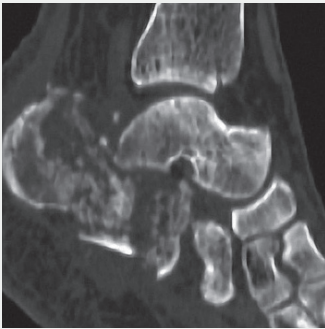


CERAMENT®|BVF placement for non-union and arthrodesis management



Final post-op

Open Calcaneal Fracture²- 5cc



Pre-op



Pre-op



Post-op

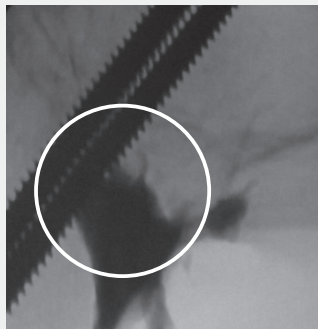


6 month post-op

Charcot Deformity³



Pre-op



Post-op



3 months

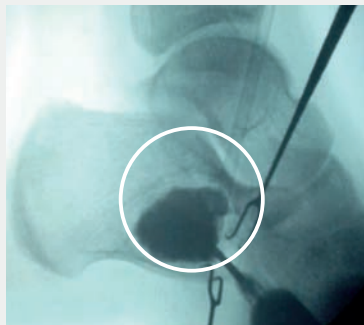
CERAMENT®|BVF used in the posterior ankle to fill in residual gaps around the arthrodesis.

At 3 months, bone has fully remodeled and patient is full weight bearing.

Calcaneal Benign Bone Cyst Removal⁴



Pre-op lateral radiograph of calcaneal bone cyst



Intra-op



24-month post-op lateral radiograph demonstrating complete incorporation of the bone

CERAMENT®|BONE VOID FILLER in Ortho-Oncology

Minimally Invasive Treatment of a Benign Proximal Humeral Cyst

Large unicameral bone cyst (UBC) of the proximal humerus with thinning of proximal cortices (Fig. 1).

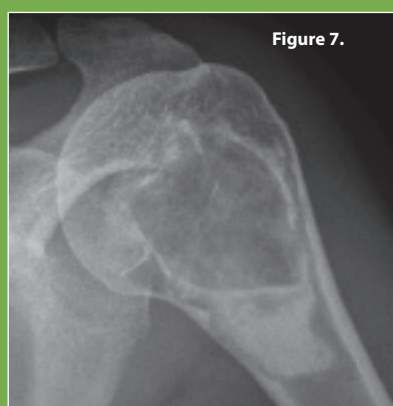
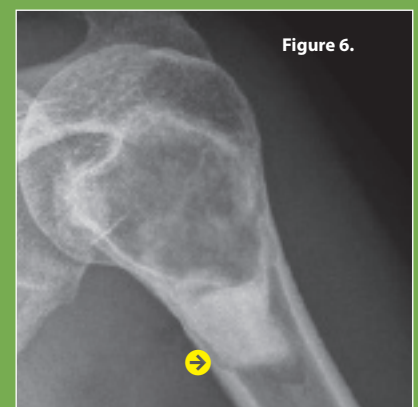
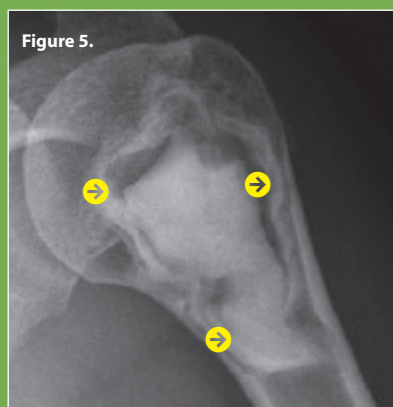
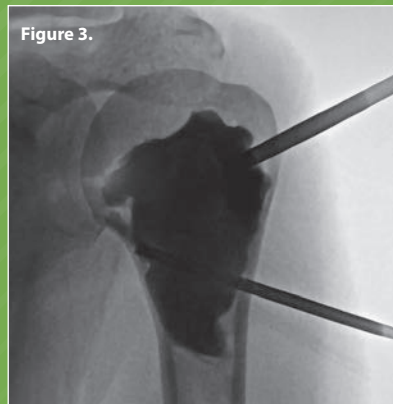
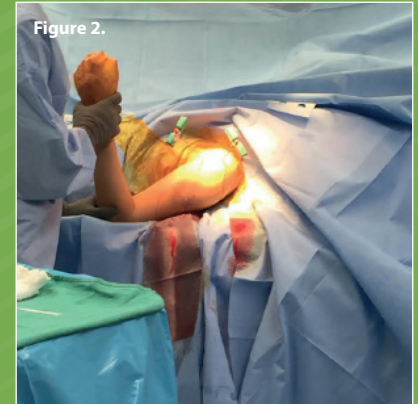
The cyst was aspirated using a large-bore needle then exchanged for a cannula for pressure relief during injection of CERAMENT®|BONE VOID FILLER (Fig. 2, 3).

An additional cannula was placed into the distal part of the cyst. The CERAMENT®|BONE VOID FILLER delivery syringe was attached to the end of the distal cannula and injected one minute after mixing to ensure complete filling of the void via a bottom-to-top (distal to proximal) technique.

30cc of CERAMENT®|BONE VOID FILLER was injected. Iohexol provides visibility of product under fluoroscopy (Fig. 3) and the post-operative radiograph (Fig. 4).

6 week X-ray demonstrates a white 'halo effect' outlining the cyst (Fig. 5). At 3 months, early bone remodeling is seen, along with a 'puddling effect' at bottom of cyst (Fig. 6).

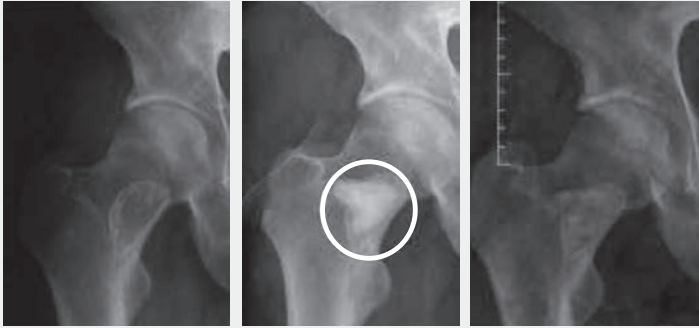
5 month X-ray shows on-going replacement of CERAMENT®|BONE VOID FILLER with new cancellous bone (Fig. 7).



Reference:

Joseph Benevenia, M.D.
Rutgers University Hospital, Newark, NJ

Femoral Neck Bone Cyst¹

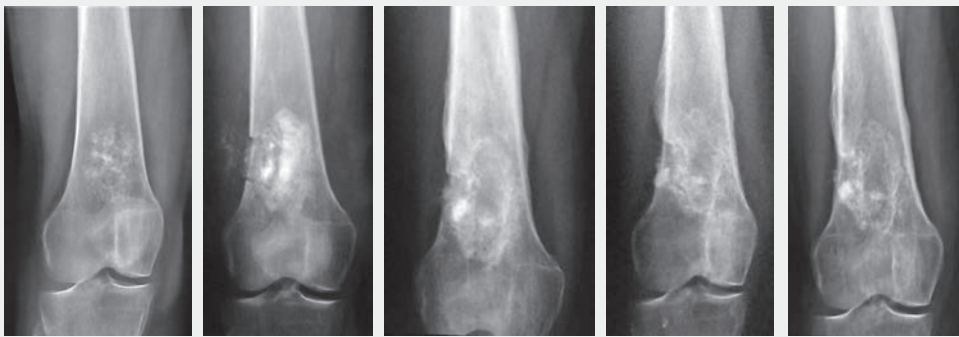


Pre-op

Intra-op with 10cc of CERAMENT®|BVF

After one year, bone remodeling is demonstrated.

Enchondroma of the Distal Femur, 63 Year Old²



Pre-op

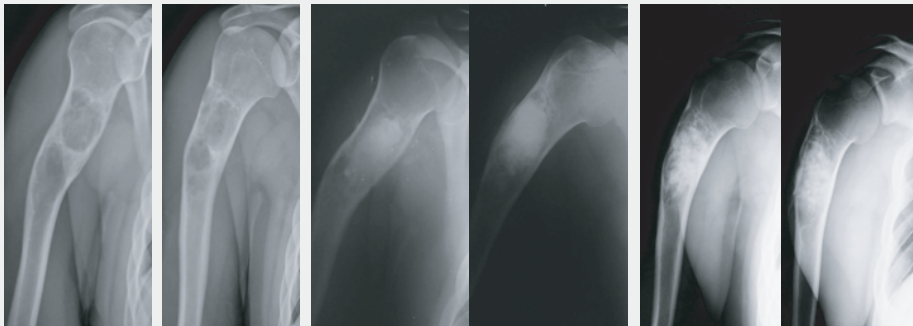
20 days post-op

5 month post-op showing early bone formation

7 month post-op showing continued bone regeneration

10 month post-op showing continued bone regeneration

Bone Cyst of the Proximal Humerus³



Pre-op

Pre-op

Post-op showing where CERAMENT® was injected

4 month post-op increasing bone density indicating bone regeneration



Restoring health to improve
the quality of life for patients
with bone disorders.

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