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## Spine

Yu, X. et al. Clinical Evaluation of Mineralized Collagen as a Bone Graft Substitute for Anterior Cervical Intersomatic Fusion. *Journal of Biomaterials and Tissue Engineering*. 2, 170-176, 2012. [Download](#)

### Study Design:

- Prospective study: 91 patients with symptomatic cervical disc diseases;
- 46 cases treated with BonGold Bone Graft; 46 cases treated with autograft.

Test Materials: BonGold™ BonBits™

### Outcome Measures:

- X-ray dynamic X-rays
- CT scans or MRI-Fusion assessment
- Odom's Criteria
- 3, 6, 12 and >24 months post-op following up

### Results:

- Odom scores above good reached 93%
- BonGold™ group exhibits comparable fusion rate as the autograft group

## Foot/ Ankle

Lian, K., et al. The Mineralized Collagen for the reconstruction of intra-articular calcaneal fractures with trabecular defects. *Biomatter*. 3: 4, e277250 October/December; 2013.

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### Study Design:

- Retrospective; 24 pairs of patients
- intra-articular calcaneal fractures with trabecular defects

### Test Materials:

- BonGold™ bone graft (mineralized collagen)
- Autograft

### Outcome Measures:

- X-rays
- CT scans
- Maryland foot score
- 3 weeks, 12 weeks, 6 months and 12 months post-op follow up

### Results:

- The radiographic evaluation confirmed that all the fractures were healed without secondary loss of reduction
- Clinical outcomes: the mean duration of surgery in autograft group was significantly longer 106 min. (autograft group) vs. 80 min (BonGold™ bone graft group)
- BonGold™ Bone graft is a good autograft alternative in displaced intra-articular calcaneal fractures with trabecular defects.

## Foot/ Ankle

Nihar S Ghate and Helen Cui. Mineralized collagen artificial bone repair material products used for fusing the podarthral joints with internal fixation-a case report. Regenerative Biomaterials. 1-4, 2017. [Download](#)

### Study Design:

- A case study

### Test Materials:

- BonGold™ BonActiv™ and Fusion Foam™

### Outcome Measures:

- X-rays
- 2, 4, 6, 9 and 13 weeks post-op follow up

### Results:

- These results justified and favored the application of BonGold™ as an excellent alternative to autograft in fusing the podarthral joints with internal fixation.

## Nonunion

Kou, J-M, et al. Clinical Observations on Repair of Non-infected Bone Nonunion by Using Mineralized Collagen Graft. Journal of Biomaterials and Tissue Engineering Vol. 4, 1107-1112, 2014. [Download](#)

### Study Design:

- 23 patients suffered from non-infected nonunion were treated with MC bone graft combined with autologous bone marrow.

### Test Materials:

- BonGold™ BonBits™

### Outcome Measures:

- X-ray
- 1, 3, 6, 9, 12 and up to 26 months post-op following up
- 36-item short form health survey (SF-36) questionnaire at the last follow up

### Results:

- All the bone non-unions reached clinical healing in  $6.4 \pm 0.7$  months
- SF-36 scores were as:
  - physiological function was  $53.8 \pm 28.7$
  - Physical pain was  $48.7 \pm 25.4$
  - general health was  $62.3 \pm 20.2$

# Hip Revision

Huang C., et al. Clinical evaluation following the use of mineralized collagen graft for bone defects in revision total hip arthroplasty. *Regenerative Biomaterials* Nov. 11, 1-5; 2015.

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## Study Design:

89 patients with aseptic loosening with acetabular or femoral bone defects

- 30 cases with acetabular loosening.
- 20 cases with femoral loosening and
- 39 cases with both of them

Test Materials: BonGold™ BonBits™

## Outcome Measures:

- X-ray
- Harris hip score to evaluate the overall hip function.
- Follow up at 3 months, 6 months, 10 months and annually check (The average follow-up time was 33.6±2.4 months)

## Results:

The Harris hip score were 42.5±3.5 pre-operation; 75.2±4.0 at 10<sup>th</sup> month; and 95.0±3.6 at the final follow-up.

Conclusion BonGold™ bone graft may be a promising solution for THA revision with massive bone deficiency due to its excellent performance in hip function improvement and few complications. Extended follow-up is necessary to further prove the feasibility of this approach.

# Distal Radius

Liu, K. B. et al. Use of mineralized collagen bone graft substitutes and dorsal locking plate in treatment of elder metaphyseal comminuted distal radius fracture. *Front. Mater. Sci.* 8: (1): 87-94, 2014. [Download](#)

## Study Design:

- Retrospective, nonrandomized, single-surgeon study
- Elder patients with metaphyseal comminuted radius fractures were treated with dorsal locking plates with or without augmentation with BonGold™ Bone Graft
- 2 groups: 12 patients in each group

Test Materials: BonGold™ Bone graft

## Outcome Measures:

- X-ray, CT
- AO/ASIF classification system
- Follow up at 3 months, 12 months post operation

## Results:

At final follow up, no significant difference between the 2 groups in the terms of palmar tilt and radial inclination ( $p=0.8$ )

However, ulnar variance increased significantly ( $p<0.5$ ) in the group without augmentation with BonGold™ Bone graft.