64 year old female, history given: 
Study Candidate

William Millard 
7/29/2016
Right Knee MRI July 2016
Right Knee MRI July 2016
Digging Deeper

- Operative Report February 2016 described a subchondroplasty procedure utilizing Accufill calcium phosphate substrate.

- Procedure performed on the medial femoral condyle and medial tibial plateau.
Subchondroplasty
Accufill Calcium Phosphate

Images courtesy of Zimmer Biomet http://subchondroplasty.com/healthcare-professionals-bsm.html
Use

**Indications**
- Chondral defects
- Osteochondral defects
- Osteochondritis dissecans
- Osteoarthritis
- Insufficiency fractures
- Stress fractures
- Subchondral defects
- Avascular necrosis
- Spontaneous osteonecrosis of the knee

**Contraindications**
- Acute tibial plateau fractures
- Acute distal femur fractures
- Undiagnosed bone lesions
- Infection
- Malignancy
“During The SCP® Procedure, AccuFill® BSM, an injectable, flowable, engineered calcium phosphate bone substitute is used to fill a subchondral bone defect. AccuFill® BSM crystallizes and hardens in an endothermic reaction at 37°C to form a nanocrystalline, macroporous scaffold in the bone. Over time, through cell-mediated remodeling, AccuFill® BSM is resorbed and replaced with new bone.”
Procedure

Courtesy of YouTuber mysportsdoc https://www.youtube.com/watch?v=Ei9Bin7_64A
“To our knowledge, the MRI findings of knee subchondroplasty have never been described in the radiological literature. The purpose of this study is to describe the characteristic findings of knee subchondroplasty seen on MRI.”
42-year-old man

4 months postprocedure

42-year-old man

6 months after

58-year-old man

Returning to Our Case
Right Knee MRI January 2016
Right Knee MRI July 2016
References


### AccuFill® BSM Performance

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Feature</th>
<th>Benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>Handling</td>
<td>Truly injectable. Remains cohesive. Flowable inside cancellous bone. 15 minutes of working time.</td>
<td>No need to remove subchondral bone. No phase separation from injection pressure. Interdigitates easily for complete defect fill. Long window for implantation; intraoperative flexibility.</td>
</tr>
<tr>
<td>Setting</td>
<td>Endothermically sets in 10 minutes at 37°C.</td>
<td>Sets hard after closure, no thermal necrosis.</td>
</tr>
<tr>
<td>Structure</td>
<td>Osteoconductive. Nanocrystalline structure. 65% total porosity; 1-300 μm pore size. 10 MPa compressive strength.</td>
<td>Nanocrystalline structure and high surface area facilitate remodeling and bony ingrowth. Physical properties comparable to cancellous bone.</td>
</tr>
</tbody>
</table>

**AccuFill® BSM = Ca_{10-x}(M)_x(PO_4)_{6-x}(HPO_4,CO_3)_x(OH)_{2-x} = Bone**^1

AccuFill® BSM is manufactured by Etex, a subsidiary of Zimmer Biomet and leader in bioresorbable bone substitute materials. The company is headquartered in MIT’s University Park in Cambridge, Massachusetts, a world renowned center for biotech research and innovation.