2–Year Outcomes of the Treatment of Defects from Bone Marrow Lesions with Subchondroplasty[1]

Zimmer Biomet Summary of Published Article

66 Procedures Performed by Steven B. Cohen, MD, of The Rothman Institute, Philadelphia

Bone marrow lesions (BML) are MRI-visible reactions to stress injuries or fractures of the subchondral bone.[1] These defects occur when bone remodeling fails due to ongoing or increased stress and/or reduced healing capacity in the region.[2] Patients with BML defects typically have substantial chronic, aching pain, primarily on weight-bearing, and may have a worsening prognosis when left untreated.[3,4]

In patients with BML defects of the knee, current treatment guidelines recommend an initial course of conservative care, which may improve symptoms and delay further treatment.[5,6] Patients with these defects, however, are likely to progress to requiring total knee replacement (TKR) or osteotomy,[6,7] with an incidence reported in one study as 9 times more likely than patients without marrow involvement.[6] Although generally successful, TKR is associated with prolonged recovery and ongoing functional limitations. Less invasive treatment options with more rapid recovery would be desirable, especially for younger or more-active patients.

A promising treatment for subchondral bone defects associated with BML is Subchondroplasty® (SCP®), developed by Peter Sharkey, MD and Charles Leinberry, MD.[8] The SCP Procedure fi lls cancellous bone defects with AccuFill®, an injectable, flowable, engineered calcium phosphate bone substitute.[8,9,10] AccuFill crystallizes and hardens in an endothermic reaction at 37° C to form a nanocrystalline, macroporous scaffold in the subchondral bone, while also promoting cell-mediated remodeling.

Methods

Consecutive patients treated with SCP between May 2008 and May 2012 were contacted at least 2 years following SCP to determine post-operative state. Patients were evaluated for pain (VAS score) and length of delay to TKR. 2-year status was captured for 60 of 66 patients (91%).

Patient Demographics

- BML on MRI determined to be primary driver of patient symptoms
  - Pain isolated to compartment with BML
- Advanced DJD in compartment with BML, Mid-stage DJD in other 2 compartments
- All patients had been scheduled for TKR
- Non-responsive to other conservative or minimally-invasive therapy

	Age	Height	Weight (lbs)	BMI	Alignment	Symptom Length (months)	ICRS Grade in Treated Compartment
Min	33	5'0"	115	20.3	-10˚ Valgus	2	0
Avg	55.9	5'7"	195	30.1	1.9˚ Varus	22.4	3.6
Max	76	6'2"	350	53.2	8˚ Varus	180	4

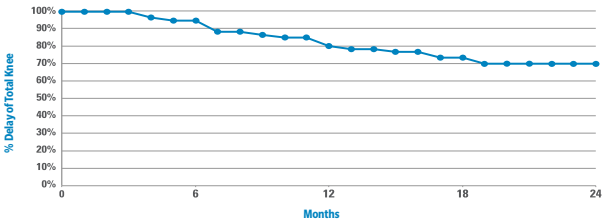
Summary of Results

- Substantial, consistent reduction in pain
- 70% of patients delayed TKR at least 2 years
- Reduced rehabilitation time when compared to TKR

Summary of Results

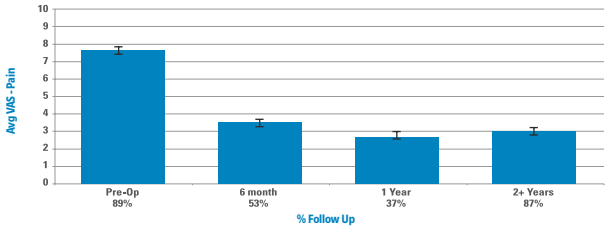
1) SCP can help a patient delay a total knee replacement:

70% of patients who were scheduled to receive TKR were able to delay arthroplasty by at least 2 years.



2) SCP provided significant pain relief:

Pain improved by > 4 points.



3) SCP reduced rehabilitation and recovery as compared to TKR

Study postoperative protocol:

- Strict pain management 48-72 hours postop
- Weight bearing as tolerated with crutches as needed
- Standard post-arthroscopy PT regimen
- Return to Work and Activity as tolerated

Discussion

- SCP was offered as a targeted treatment of BML defect, as an alternative to total knee replacement
- Patients demonstrated and maintained a strong response to SCP treatment
- Reduced rehabilitation and recovery time when compared to TKR
- SCP demonstrated efficacy in a population with advanced DJD

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