

SPORTS MEDICINE

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Microfracture success depends not only on the operation but rehabilitation as well
Surgeon shares pearls for optimal results with using microfracture to repair articular cartilage.
by Tina DiMarcantonio

To achieve satisfactory results with microfracture, one expert suggests the following: Adhere to the selection criteria, follow the appropriate procedure and always prescribe standard rehabilitation for 8 weeks postoperatively.

“When we started with microfracture ... we felt that the rehabilitation program was equally as important as the surgical procedure,” J. Richard Steadman, MD, said. “We’ve been able to show in several studies that if you follow both the operation and the rehabilitation program, the chances of success are pretty high.”

Steadman and colleagues at the Steadman Hawkins Clinic have conducted numerous studies on microfracture, showing long-term success up to 11 years and success in high-level athletes, as shown in a 2003 study on National Football League players.

His comments came during the American Orthopaedic Society for Sports Medicine Specialty Day meeting.



For microfracture surgery, Steadman uses angled picks to create a rough surface, which attracts and holds the clot. He typically uses three different angles of picks in order to reach every possible point in the joint.

Images: Steadman JR



Surgeons typically use microfracture to treat contained or traumatic lesions, which have surrounding cartilage rims, as seen here.



Microfracture is also useful in treating degenerative joint disease lesions, such as this one. Surgeons also may perform an abrasion arthroplasty in these cases, because the bone is thick and sclerotic and the lesion does not have a calcified cartilage layer.

Surgical points to consider

In treating articular cartilage defects, microfracture offers an arthroscopic alternative to chondral resurfacing with less heat necrosis, a rough surface for blood clot attachment, retention of the subchondral plate and access to mesenchymal cells, he said.

Steadman said he uses angled picks for creating fractures in microfracture surgery. These picks also allow surgeons to create the rough surface to which the marrow clot adheres.

“We want to get to every point in the joint and create a perpendicular hole in the subchondral bone,” Steadman said. “In order to do that, we had three different angles of picks. ... I never had a situation where I could not get a perpendicular hole in the joint, whether posterolateral or posteromedial.”

Microfracture for DJD

Surgeons may use the microfracture technique to treat traumatic lesions, which have surrounding cartilage rims, or degenerative joint disease (DJD) lesions.

“The DJD surface is also a candidate for a microfracture, but there’s no calcified cartilage layer, and the bone is very thick and sclerotic. Usually there’s an angular deformity,” Steadman said.

Surgeons typically perform an abrasion arthroplasty along with microfracture in DJD cases, he noted.



In one basic science study, investigators compared horses’ untreated control sides, such as the one seen on the left, to sides treated with microfracture shown on the right. Investigators found a higher percentage of Type II collagen and a greater volume of hybrid cartilage repair tissue in the treated sides.

Lessons learned

Steadman referred to early basic science equine studies that paved the way for microfracture as it is performed today.

In one study, he and his colleagues found that leaving the calcified cartilage layer interferes with new cartilage formation and significantly decreases the chances of growing new cartilage. “This made us more adherent to the principle of creating a raw bone bed at the base of the lesion,” he said.

Another compared each horse’s untreated control side to a microfracture side, they found a higher percentage of Type II collagen on the treated side. Furthermore, a greater volume of repair tissue, classified as hybrid cartilage, filled the treated defects (74%) than the control defects (45%).

“The thing you have to remember about this procedure is it’s a natural process,” Steadman said. “This is the way the body is meant to heal itself with a little bit of help from us.”

Rehabilitation protocol

In a presentation handout, Steadman listed rehabilitation as immediate continuous passive motion at one cycle-per-minute for 8 hours-per-day for 8 weeks. Also for 8 weeks, he prescribes 20% to 30% of body weight touch-down, weight-bearing crutch walking. After 8 weeks, patients move on to full weight-bearing and active range of motion.

For more information:

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