

Study assesses new surgical procedure for regenerating cartilage in damaged knee joints

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Rush University Medical Center is testing a new procedure for regenerating damaged articular cartilage in the knee joint to relieve the pain of osteoarthritis. Rush is the only center in Illinois participating in the CAIS Phase III clinical trial.

The procedure, called the Cartilage Autograft Implantation System (CAIS), involves extracting cartilage from the healthy tissue that remains in the knee, breaking it into tiny fragments to enable it to grow and expand, fixing it onto a biologically reabsorbable scaffold, and then implanting the scaffold with the cartilage cells back into the damaged area - all in a single surgery.

Earlier laboratory studies at Rush had indicated that the procedure can yield the tougher hyaline cartilage that naturally occurs in the joint, unlike the most popular surgical treatment currently for regenerating cartilage, called microfracture.

"We are making advances in the field of cartilage restoration all the time," said Dr. Brian Cole, an orthopedic surgeon who is heading up the study at Rush.

Up to 40 centers in North America are participating in the clinical trial after a pilot study in 2006 demonstrated the procedure was safe. Investigators now are determining whether the procedure is as at least effective as microfracture, and possibly better.

Approximately 300 patients will be enrolled in the trial, including both men and women ages 18 to 65 who have one or two lesions in their knee, but not significant arthritis that might require a [knee replacement](#). Participants will be followed for 48 months.

Results will be compared with outcomes for

microfracture, in which the surgeon creates tiny fractures in the bone underlying the damaged cartilage with a tiny pick-like tool. Blood and marrow, which contains stem cells, leak out of the fractures, forming a blood clot with cartilage-building cells. But studies have shown that microfracture is not always the ideal treatment.

"Microfracture promotes the growth of fibrocartilage, a weaker form of cartilage," Cole said. "It lacks the composition, structure, and functionality of articular cartilage, the type of tissue normally found in the knee joint. Fibrocartilage is unable to endure repetitive forces, and so it may eventually break down, even under normal use, requiring further surgical intervention."

The CAIS procedure could potentially eliminate these problems.

"The aim is to produce new articular cartilage that more closely mimics the original tissue, providing the nearly frictionless surface required for movement and high wear resistance," Cole said.

Cole has numerous years of experience in tissue repair and heads the Cartilage Restoration Center at Rush, a multidisciplinary program specializing in the repair and regeneration of articular and meniscal cartilage. He has authored numerous peer-reviewed studies on the subject and teaches the surgical techniques to physicians in the U.S. and abroad.

Source: Rush University Medical Center ([news](#) : [web](#))

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