

Stem cells may improve tendon healing, reduce retear risk in rotator cuff surgery

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An injection of a patient's bone marrow stem cells during rotator cuff surgery significantly improved healing and tendon durability, according to a study presented today at the 2015 Annual Meeting of the American Academy of Orthopaedic Surgeons (AAOS).

Each year in the U.S., more than 2 million people have [rotator cuff surgery](#) to re-attach their shoulder tendon to the head of the humerus (upper arm bone). Rotator cuff tears can occur during a fall or when lifting an extremely heavy object; however, most tears are the result of aging and overuse.

The French study, of which a portion appeared in the September 2014 issue of *International Orthopaedics*, included 90 patients who underwent rotator cuff surgery. Researchers tried to make the two groups as equivalent as possible based on rotator cuff tear size, tendon rupture location, dominant shoulder, gender and age. Forty-five of the patients received injections of bone marrow concentrate (BMC) mesenchymal stem cells (MSCs) at the surgical site, and 45 had their rotator cuff repaired or reattached without MSCs.

Patient ultrasound images were obtained each month following surgery for 24 months. In addition, MRI images were obtained of patient shoulders at three and six months following surgery, and at one year, two years, and 10 years following surgery.

At six months, all 45 of the patients who received MSCs had healed

rotator cuff tendons, compared to 30 (67 percent) of the patients who did not receive MSCs. The use of [bone marrow](#) concentrate also prevented further ruptures or retears. At 10 years after surgery, intact rotator cuffs were found in 39 (87 percent) of the MSC patients, but just 20 (44 percent) of the non-MSc patients.

In addition, "some retears or new tears occurred after one year," said Philippe Hernigou, MD, an orthopaedic surgeon at the University of Paris and lead study author. "These retears were more frequently associated with the control group patients who were not treated with MSCs.

"While the risk of a re-tear after arthroscopic repair of the rotator cuff has been well documented, publications with long-term follow-up (more than three years) are relatively limited," said Dr. Hernigou. "Many patients undergoing rotator cuff repair surgery show advanced degeneration of the tendons, which are thinner and atrophic (more likely to degenerate), probably explaining why negative results are so often reported in the literature, with frequent post-operative complications, especially re-tear. Observations in the MSC treatment group support the potential that MSC treatment has both a short-term and long-term benefit in reducing the rate of tendon re-tear."

More information: [Study abstract](#)

Provided by American Academy of Orthopaedic Surgeons

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