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# Study shows PRP, commonly used technique to improve healing, doesn't work in rotator cuff surgery

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For years, doctors have used platelet rich plasma (PRP) to promote healing in various surgeries, but a recent study demonstrates that a type of PRP did not improve healing after rotator cuff repair. The study, conducted by Hospital for Special Surgery (HSS) investigators, will be presented at the upcoming American Orthopedic Society for Sports Medicine (AOSSM) 2011 Specialty Day meeting, held Feb. 19 in San Diego, Calif., following the annual meeting of the American Academy of Orthopaedic Surgeons.

"I would not recommend platelet-rich fibrin matrix [PRFM] as we used it in this study until we gain further information," said Scott Rodeo, M.D. He led the study and is co-chief of the Sports Medicine and Shoulder Service and professor of Orthopedic Surgery at HSS. PRP has been used extensively in orthopedic surgeries and the study begs the question of whether it has been used prematurely in some cases, before sufficient evidence has accumulated to back up its usefulness.

"The general PRP has been used extensively in orthopedics and in other areas," Dr. Rodeo said. "There are a number of different types of PRP, and I think we need more information to identify the appropriate doses and the appropriate timing of giving it."

For roughly 15 years, PRP has been used to improve healing in various surgeries, especially oral and maxillofacial surgery, with varying degrees

of success. Because there is a rate of incomplete or failed healing after rotator cuff repair surgeries, investigators at HSS set out to test whether a type of PRP, platelet-rich fibrin matrix (PRFM), could improve tendon healing in this surgery.

Platelets have proteins that are known to improve cell proliferation, cell division, and cell migration, a myriad of processes that can encourage healing. To create PRP, doctors extract blood from a patient and then use a centrifuge to isolate the platelets. In the study presented at AOSSM, the investigators then used calcium chloride to make a gummy substance that they could implant in the patient. "It is essentially a material that can be actually sutured in at the time of surgery. It's almost like chewing gum in consistency," Dr. Rodeo said. "In rotator cuff repair, we attached it to a suture which was used to reattach the tendon to the bone." The substance is then supposed to stimulate healing.

In the prospective, patient-blinded trial, 79 patients were randomized to rotator cuff surgery with or without an implant of PRFM. Patients in both groups received the same rehabilitation after surgery. The primary end point of the study was tendon healing evaluated by ultrasound at 6 to 12 weeks. Investigators also analyzed shoulder outcome scales and strength measurements. Overall, there was no difference in tendon-to-bone healing between the PRFM and the control group. There were also no significant differences in the shoulder outcome scales between groups. If any difference was identified, it was slightly negative—patients in the PRFM group showed more tendon defects at 12 weeks, although the difference was not statistically significant.

"There are a number of variables that we need to better control including dosing and timing," Dr. Rodeo said. He pointed out that only one injection was used in the study and that perhaps repeat injections are needed.

He also said that a major issue that needs tackling is the variability in how PRP is made. "The bigger issue is that there is a lot of variability from patient to patient. There are inter-individual variations, potentially huge variations in my platelet count versus your platelet count and how many proteins are in my cells versus your cells," Dr. Rodeo said. He said studies are needed to shed light on how this affects the product that is produced.

"Before this study, we knew that platelets had the potential to improve healing and now we know that in the dose and the type used in this study that it did not have a positive effect on rotator cuff repairs," Dr. Rodeo said. "We realize that tendon biology is very complex and it is a bit of a pie in the sky to think that one injection would make a huge difference. I don't think the study indicates that the material has no use, I think it just points out that there are just so many variables that we need better information about."

Provided by Hospital for Special Surgery