

M.D. NEWS

Special Feature

Reverse Shoulder Replacement Surgery

New Hope for Patients with Chronic Shoulder Pain

By Gretchen Johnson

When traditional treatments and surgeries fail, patients with severely degraded rotator cuffs have new hope with a dramatic and innovative shoulder replacement surgery being performed at Saint Mary's Health Care in Grand Rapids.

The reverse total shoulder replacement designed by Paul Gramont was introduced in Europe in 1987 and approved by the Food and Drug Administration for use in the United States just two years ago. Available at a limited number of hospitals

Tim Lenters, MD, an orthopedic specialist at River Valley Orthopedics, has performed the reverse total shoulder replacement at Saint Mary's since November 2005.



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Typical patient candidates are those with failed and painful rotator cuff repairs, rotator cuff tear arthritis, failed or unstable shoulder replacements and patients with pseudo-paralysis as a result of severely limited arm function.

nationwide, the procedure has been performed at Saint Mary's since November of 2005 by Tim Lenters, MD, an orthopedic specialist at River Valley Orthopedics.

"This needs to be thought of as a salvage procedure, meaning that it is an end-stage, last resort, last-ditch effort for cuff tear arthropathy or for an unstable shoulder replacement," Dr. Lenters says. "It's your bailout when everything else you've tried has failed."

Like traditional shoulder replacement surgeries, the arthritic joint surfaces are replaced with a highly polished metal ball attached to a plastic socket. But in the reverse procedure, the socket and metal ball are switched. The reverse procedure constrains the ball in a cup that is inserted into the end of the humerus and the metal ball is attached to the shoulder bone. This allows the patient to use the healthier, stronger deltoid muscle instead of the torn rotator cuff to lift the arm.

"Of the patients I've seen," Dr. Lenters says, "their pain is

a 10 out of 10 when they come in. The pain is so severe they can't sleep at night, they can't do their activities of daily living. You can just see on their face that they are unhappy. They're depressed about their shoulder and it's affecting everything about what they do and who they are. After the procedure, their pain is improved to the point where they are a different person. They are able to take care of themselves. In many ways, this procedure can give them their life back."

Dr. Lenters, who received his fellowship training in this procedure at the University of Washington's Department of Orthopedics and Sports Medicine, says typical patient candidates are those with failed and painful rotator cuff repairs, those with rotator cuff tear arthritis, failed or unstable shoulder replacements and patients with pseudo-paralysis as a result of severely limited arm function.

"Without an intact rotator cuff, the ball can ride high in the socket and wear abnormally, creating abnormal contact forces across the joint. The joint just wears out," he says, adding that two significant factors result from this condition.

"One of the things that can happen is 'cuff-tear arthropathy.' In the later stages of a cuff tear, the patient develops arthritis in the shoulder and the result is constant pain, weakness and lack of function."

Dr. Lenters described the condition of cuff-tear arthropathy as one that occurs when the rotator cuff muscles that surround the shoulder joint have deteriorated or become so weak that they can no longer hold the shoulder joint in place or allow it to function normally. In addition to massive tears, it can also be caused by a previous shoulder injury — such as a fracture — or by unsuccessful previous surgeries.

"Most of the people I've seen who need this procedure are those who suffer from a massive rotator cuff tear," Dr. Lenters says. "When that happens there is just no good way to stabilize the ball in the socket short of a shoulder fusion. In older patients who have less of an ability to successfully heal a fusion, you have to put them in a body cast for three months. That's not a fun procedure for anyone," he says.

The second result of the unconstrained ball joint is limited mobility of the patient's arm — something he calls pseudo-paralysis.



The Delta CTA Reverse Shoulder System from DePuy Orthopaedics

“When patients try to bring their arm up, the ball essentially dislocates off the top of the socket. When this happens they can hardly get their arm away from their body. The shoulder hikes up on them and all they get is just a few degrees of elevation of the arm away from the body.”

The reverse total shoulder replacement surgery addresses both issues of pain and immobility. And though the procedure can’t restore total mobility of the shoulder, it can significantly improve the patient’s ability to elevate the arm.

“With this device, people can get their elbow to shoulder height or maybe a little beyond,” Dr. Lenters says. “You won’t be perfect, but you will have significantly more mobility than you had before.”

Though only a small fraction of shoulder surgeries require a total reverse shoulder replacement — in the past year Dr. Lenters has performed five such surgeries — he believes that the need for increased shoulder surgeries in general will continue to rise.

“Rotator cuff disease is very, very common. Approximately 50 percent of patients who are 50, and 70 percent of patients who are 70, will have some kind of rotator cuff disease. Rotator cuff disease has a natural progression, and a small tear can get bigger and bigger over time. Cuff-tear arthropathy can be the end result.”

While the number of shoulder replacement surgeries performed in the U.S. continues to lag behind hip and knee replacements, the American Academy of Orthopaedic Surgeons does report a growing trend. According to the AAOS website, more than 5.3 million physician visits were attributed to rotator cuff complaints in 2004, and an estimated 29,000 partial or total shoulder replacement surgeries were performed nationwide that year.

The reverse total replacement surgery is usually reserved for older patients. In fact, DePuy, who makes the prosthesis — called the Delta CTA Reverse Shoulder System — recommends that patients be 70 years old before receiving their device. Because of the advanced age of patients, the procedure often proves the only viable alternative to lengthier and more involved procedures such as the shoulder fusion.

“The mere fact that the population is getting older means you’ll see a lot more rotator cuff tears. Potentially with that, you will see more patients who have end-stage cuff-tear arthropathy,” Dr. Lenters says.

Primary care physicians can help reduce the number and severity of shoulder injuries by encouraging patients to modify risky behavior and by treating minor disorders early. Dr. Lenters says its also important to note that as patients age — and as the health care profession learns more about the long-term effects of traditional shoulder replacement and

shoulder repair surgeries on an aging population — prescribed treatment protocols are changing.

“One of the classic teachings has always been that when you are treating shoulders with rotator cuff problems, you need to do something called an acromioplasty,” he says. “When you do an acromioplasty you release an essential ligament and make the normal smooth curved bone on top of the shoulder into a flat bone. With these two events, you no longer have a smooth concavity at the top of the shoulder to help contain the ball. Now you have this situation where the ball can escape, leading again to abnormal wear due to abnormal contact forces across the joint.

“Within the last five years we’ve seen that classic thinking change from ‘always do an aggressive acromioplasty’ to ‘take less and less of that bone down.’ Today, experts often recommend a release of just a portion of the ligament.”

The reverse total shoulder replacement surgery can be performed on shoulders where earlier surgeries have failed. “But there’s not a lot of literature that talks about revision of the reverse ball and socket,” Dr. Lenters says. “You really have to leave it up to the patient and say, ‘this can be a wonderful operation. It can take your pain away and let you sleep at night. But it has to be bad before you do it. Because if it goes wrong, if it gets loose, gets unstable, gets infected ... there is not a good fix. It is your last step.’”

Possible complications include post-operative infection, which he says seems to occur at a higher rate with the reverse total shoulder replacement surgery than with traditional shoulder replacements. “That may have to do with the fact that the patients you’re doing this on are a little older, a little sicker,” he says. “Worst-case scenario, if you have a problem with the reverse, you could end up with a resection of it, which would leave you with nothing and possibly even amputation if an infection occurs.”

The procedure takes two to three hours to complete and requires a two- to three-day hospitalization. Patients can expect to have their arm wrapped in a sling for several weeks, but often activities of daily living can begin soon after surgery. Formal

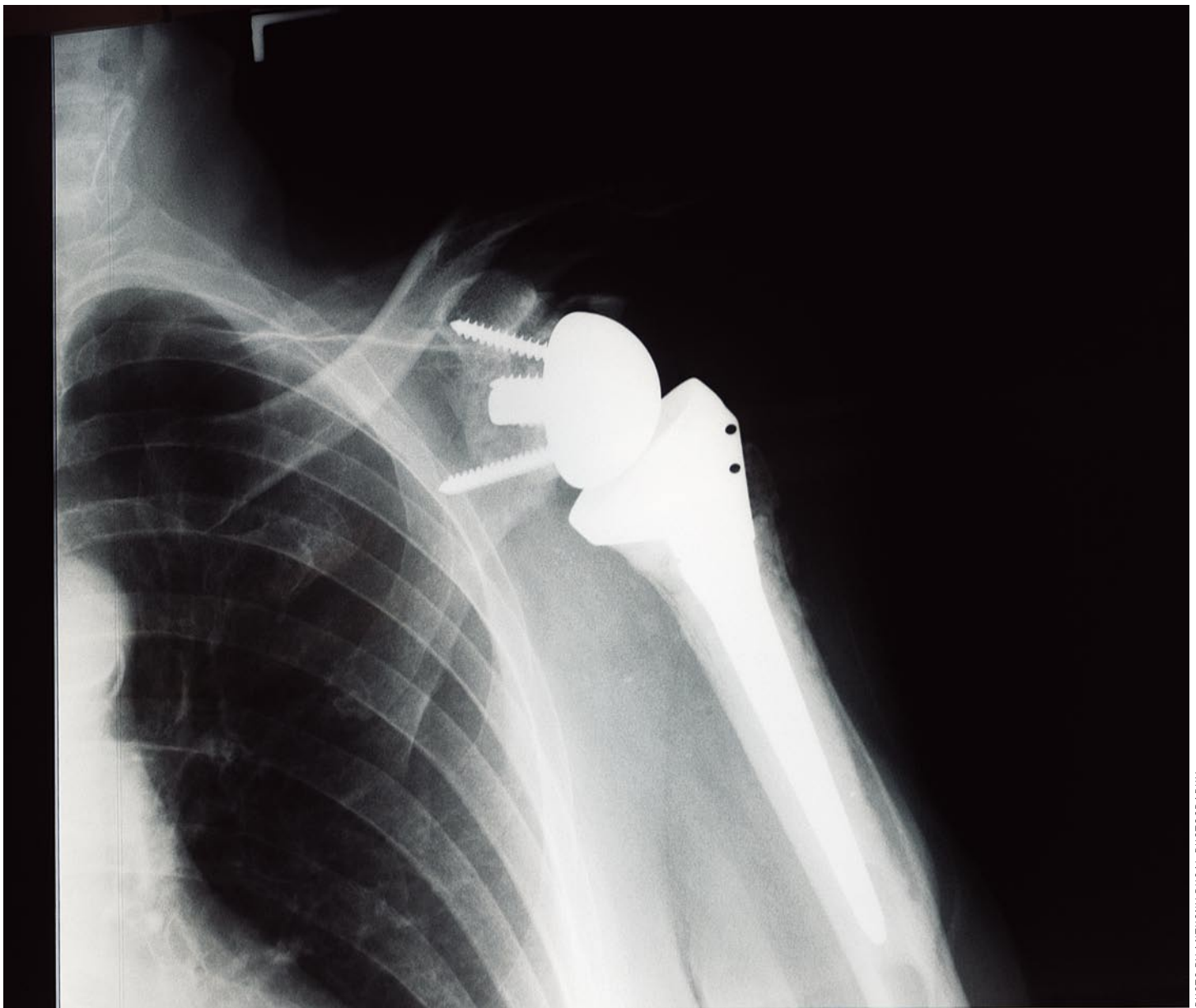


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The reverse total shoulder replacement surgery addresses issues of pain and immobility, significantly improving the patient's ability to elevate the arm.

physical therapy is usually not required.

Anyone who has a condition that predisposes them to an infection is a poor candidate, Dr. Lenters says. That may include patients with diabetes, someone who is on an immunosuppressant, or someone with rheumatoid arthritis. And because of the need to affix the prosthesis to the shoulder, patients with poor bone quality are also poor candidates.

The ideal candidate, Dr. Lenters says, is an otherwise healthy patient with a cuff tear, "someone who isn't necessarily swinging for the fence, but someone who is just looking for pain relief and to have the ability to perform their activities of daily living again."

Tim Lenters, MD, attended medical school at Rush Medical College in Chicago, followed by a residency with the Grand Rapids Orthopedic Surgery Residency Program. He completed his fellowship at the Department of Orthopedics and Sports Medicine at the University of Washington where he also served as a clinical instructor. He is currently

in private practice as an orthopedic surgeon at River Valley Orthopedics in Grand Rapids, where he is director of the Shoulder and Elbow curriculum of the Grand Rapids Orthopedic Surgery Residency Program.

River Valley Orthopedics is a group of board certified medical doctors practicing in the specialty of orthopedic surgery: the care of bones, joints of the arms and legs, as well as related structures, including nerves, ligaments, tendons and muscles. ■

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