

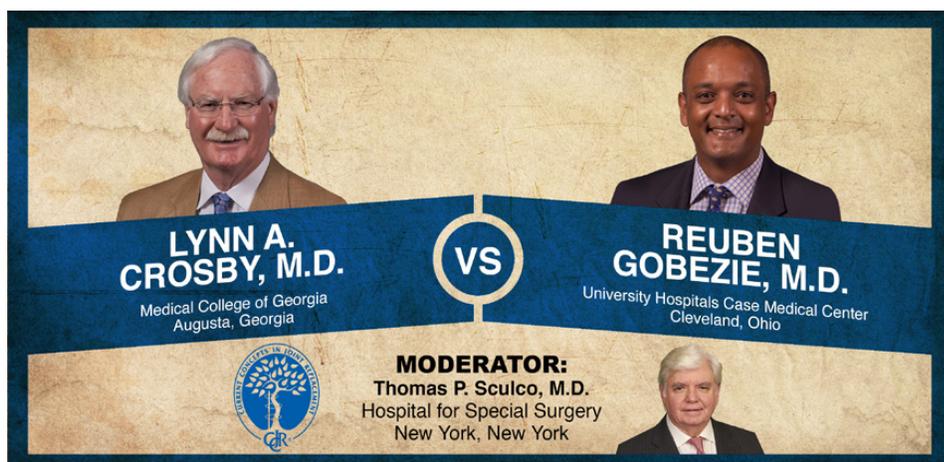
## Reverse Shoulder or Not? Crosby and Gobezie Debate Contained Cuff Arthropathy

BY OTW STAFF

According to Lynn Crosby; “When treating cuff tear arthropathy with loss of acromial-humeral distance; pain with or without activity; good deltoid tone and strength, reverse is the best option. Not so fast, says Reuben Gobezie; “don’t do these reverse replacements on patients who have these types of tears because they have pre-op range of motion greater than 90. It is not a good outcome.” Who wins this great debate? You decide.

This week’s Orthopaedic Crossfire® debate was part of the 16th Annual Current Concepts in Joint Replacement® (CCJR) – Spring meeting, which took place in Las Vegas this past May. This week’s topic is “Contained Cuff Tear Arthropathy – Best Treated with a Reverse Shoulder.” For the proposition is Lynn A. Crosby, M.D., Medical College of Georgia. Reuben Gobezie, M.D., University Hospitals Case Medical Center, is in opposition. Moderating is Thomas P. Sculco, M.D. from the Hospital for Special Surgery.

**Dr. Crosby:** Cuff tear arthropathy was first coined by Neer and Craig in 1972. A massive rotator cuff tear leads to a superior migrated humeral head, which then causes an arthritic change where there’s erosion and collapse of the glenohumeral joint. Grammont, in 1985 used the inverted version of the constrained designs of the ‘70s that have since been removed from the U.S. market. He lowered and medialized the center of rotation, increasing the moment arm of the deltoid that limited the shear forces responsible for glenoid failure. And these were brought back in the U.S. market in 2004.



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At that point [2004] the indications for the reverse shoulder were rotator cuff tear arthropathy. Reverse shoulder has since morphed into a lot more different diagnoses that we use it for. Today we’re talking about rotator cuff tear arthropathy.

Dr. Rockwood in 2006, shortly after it was re-released into the U.S. warned in a *JBS* article about the potential downsides of using this prosthesis. If we look at these complications independently, post-operative hematoma is certainly the most common. If you take the patients off their anticoagulant, use a hemovac or drain post-operatively, I think this can be completely prevented. Glenosphere dissociation is basically a technical error at the time of surgery, and so if you’re careful and put your components together, I think this can be eliminated.

Another potential complication is glenoid subluxation/dislocation, I think we’re getting a handle on that. It’s proper tensioning, and we certainly can’t control the trauma events that occur. Dissociation of polyethylene compo-

nent, is probably after a trauma event. Acromial or scapular fracture certainly is the black cloud on the horizon. We haven’t got that completely under control, but are working on it and I think there’s been some nice moves to help prevent and treat these when they do occur. Infection, I think we’re getting a handle on *P. acnes* which is a major cause and I think we’re on the way to maybe decreasing the infection rate in these prostheses. Scapular notching, I think we’ve almost eliminated that as a potential problem.

If we look at a plain X-ray, acromial descent is normal at 7mm to 14mm and if we get an MRI, we expect then that the supraspinatus will fill the fossa. If it’s less than 7mm but greater than 5mm usually the supraspinatus is retracted and the fossa would show fatty atrophy. If it is less than 5mm then we have a massive tear including the infraspinatus and the head will be high. And these are the cases that go on... if they’re not arthropathy already, they’re going to be soon, and those are the ones we’re dealing with. You can’t just deal with that MRI find-

ing. You need to look at the coronal view and if there's muscle above the tangential line, then these patients can still have a rotator cuff repair. You have to treat the patient and maybe do an arthroscopy to see if they're repairable.

If the repair's impossible, it's less than 5mm, conservative treatment is still an option. Injections. Deltoid rehab. They can get some significant relief. Arthroscopy can be a powerful tool early with debridement and biceps tenotomy, especially if they're a male with an active range of motion above 100 degrees and good deltoid tone. If repair's impossible then we start talking about arthroplasty. Then our options are hemi, standard stem or reverse. We used to think if the head was centered, then a hemiarthroplasty could be potentially helpful to the patient. So if we go from a type 1a to a type 1b...and this is really a progression...these are the ones that we

felt maybe a hemiarthroplasty might work. But what you have to realize is the erosion doesn't stop just because you put a piece of metal in there. The erosion under the acromion and under the superior aspect of the glenoid continues to happen. Then you get into these patients who have massive bone loss and they have very difficult reconstructive options. Certainly in decentered ones where you have pseudoparalysis there's really no option of a hemiarthroplasty and a reverse is really the option for them.

When treating cuff tear arthropathy with loss of acromial-humeral distance; pain with or without activity; good deltoid tone and strength with a failed non-operative treatment, I feel the reverse is the best option.

**Dr. Gobezie:** What is a contained massive cuff tear? In my mind it's a massive cuff tear, that's centered on the gle-

noid. Hence, it's contained within the glenohumeral joint. This is a unique group of patients. Usually they have preserved range of motion, oftentimes they're younger or they're very active patients because they have retained range of motion, and their typical complaint is night pain. In other words, they feel weak, but they move their arm and they have night pain.

I want to start off with showing what the literature says about this because this has been looked at. In terms of people who are not pseudoparalytic, who can still move their arms, but have massive cuff tears, there are two big series—one from Frankle and one from Boileau—showing that if you look at these patients, while you can get good results with regards to range of motion, they're not satisfied. Both of the papers concluded - don't do these reverse replacements on patients who have these types of tears because they have pre-op range

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of motion greater than 90. It is not a good outcome; neither from satisfaction...in some cases even decrease in range of motion.

What are the options for irreparable cuff tears? You have debridement, partial repair, tenotomy, muscle transfer, CTA head and...then of course if you have a hammer everything is a nail... reverse arthroplasty.

I want to share with you something that's relatively new, called a superior capsular reconstruction [SCR]. Essentially it's made and designed specifically for the patient with a contained cuff tear, and sometimes even a little superior migration and you want to avoid a reverse arthroplasty.

What is a superior capsular reconstruction? It can be done open or arthroscopically as an outpatient and

involves a graft material...either fascia lata or allograft. The difference is that in typical grafts that we've talked about before—augmentation grafts—you'll see that the augmentation graft is sewn into the muscle tendon and then inserted with screws into the greater tuberosity. In the SCR, the fixation of the graft is medial on the superior aspect of the glenoid rim and it's fixed with a lateral row of anchors laterally.

You've all heard the expression 'necessity is the mother of invention'. This approach came about because surgeons in Japan **did not** have the reverse arthroplasty until 2014. Dr. Mahata developed this technique to address the massive cuff tears in patients where he didn't have the opportunity to do a reverse. And these are often young patients with good range of motion. They use fascia lata grafts, but not allografts as we have before. The concept of SCR is to

reduce superior translation ...in other words to keep the cuff of the humeral head contained within the glenohumeral joint and allow the deltoid and the other surrounding muscles to operate and move the arm.

I want to share with you what Mark Frankle told me when I asked him 'how does the lateralized reverse work?' Dr. Crosby shared with you about the Grammont style where you dislodge the arm and you make the deltoid lever arm greater. Mark said to me, 'Any implant that stabilizes the fulcrum of the glenohumeral joint in rotator cuff arthropathy will work. The quest is how well and for how long.' That's just the point.

The whole SCR is made to stabilize the humeral head in the glenoid and allow the other muscles to work. Biomechanically this has been shown by Mahata et al. If you compare the superior capsu-

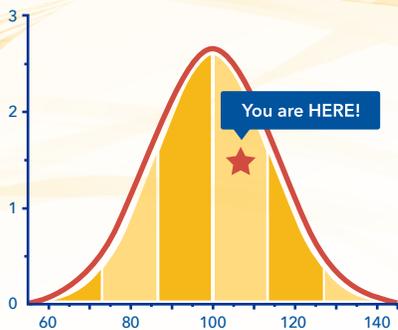
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lar reconstruction to the intact cuff, it actually resists superior forces as well as an intact cuff and better than a tendon patch and better than a rotator cuff tear would do otherwise.

The clinical outcome Mahata reported was on 24 shoulders over a two-year minimum follow-up using fascia lata and showed he could reduce the acromial humeral distance significantly. The ASES scores improved significantly. And there was only a 15% instance of graft tear. Superior capsular reconstruction offers good outcomes, quick rehab, and outpatient surgery; does not burn any bridges and that's the key. A lot of these young people who can still move their arm, don't want to have something that burns bridges and I would tell you that it doesn't burn any bridges and to me reverse replacement for a contained cuff tear is more like the wild west.

**Moderator Sculco:** Who would not be a good candidate for reverse shoulder, in your opinion?

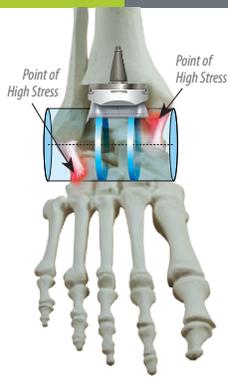
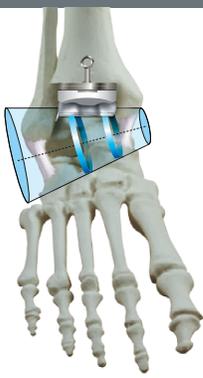
**Dr. Crosby:** Someone who has pain, number one. Certainly if they're pseudoparalytic—that's a different group. They're disabled because of their inability to use the arm, so I think that's a separate group. But certainly pain is still the major driving indication. Then the secondary arthritic changes...there are still some conservative treatments that work very well with these people who have excellent elevation above 100 degrees, have good deltoid function, and injection is still a very good option for these people early with a physical therapy program on their deltoid. If they still have excellent elevation but some pain is their complaint, then an arthroscopy in the biceps, either teno-



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my or tenodesis, can be very helpful in those people to eliminate their pain.

**Moderator Sculco:** And what's your feeling about Reuben's operation—the superior capsular reconstruction?

**Dr. Crosby:** I think it's coming along. I actually was in Liverpool on Thursday at the Liverpool Shoulder Symposium and Peter Minton, who is Reuben's mentor, presented this and said 'I did this, I do this and I did one just recently. I spent 2.5 hours trying...dropped the arm down to the side and it fell apart, so I did a reverse in the operating room the same setting.' I don't think we're quite there yet, but I think it's coming.

**Moderator Sculco:** So Reuben, you have a patient who has arthritic changes in the joint, as well as this massive rotator cuff tear. Aren't you going to do a reverse

shoulder in that patient or are you going to try to do your reconstruction?

**Dr. Gobezie:** I think it's about how the patient presents. Part of the story—they have a massive cuff tear and they have a little bit of arthritis, but the patient's functional range of motion is very important and the symptoms. Oftentimes contained massive cuff tears... those are the people who are being told 'Hey, look you need a replacement.' Oftentimes I see them and they say, 'Hey, doc I saw this guy, said replacement. I can move my arm blah, blah, blah' and their weakness is the biggest issue. I think if someone is not pseudoparalytic, the MRI's nice, the arthritis is nice, they have good function, I want to keep it that way.

**Moderator Sculco:** I want to thank the speakers for an outstanding session. ♦

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