Editorial Commentary: Shoulder Superior Capsular Reconstruction With Dermal Allograft Is Useful for Active Patients With Massive Irreparable Rotator Cuff Tear

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Abstract: Shoulder superior capsular reconstruction (SCR) with dermal allograft improves clinical outcomes in active patients with massive irreparable rotator cuff tear. SCR functions to restore the glenohumeral joint position, including humeral head depression, thus improving contact pressures. SCR is best indicated in patients with lower grades of rotator cuff arthropathy (Hamada grades 1 and 2) who are <65 years old and without pseudoparalysis. However, SCR can be indicated in very active patients older than 65. In our experience, ≤70% of the times that a SCR surgery has been indicated, a direct complete repair of the supraspinatus tendon can be achieved during surgery. Thus, indications are narrow. Finally, optimal SCR graft tensioning is a complicated but a very important consideration. If the graft is unstressed, it won't function, and if it is too tight, it will tear.

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The ideal treatment of massive irreparable rotator cuff tears has long been the partial repair, until the debate was opened after the first results of superior capsular reconstruction (SCR).[1] Long-term studies were needed to confirm the viability of this technique and survivorship of the dermal allograft. We were therefore very interested to look at the results of "Superior Capsular Reconstruction Using Dermal Allograft Is a Safe and Effective Treatment for Massive Irreparable Rotator Cuff Tears: 2-Year Clinical Outcomes,"[2] by Pashuck, Hirahara, Cook, Cook, Andersen, and Smith. It is a retrospective study of patients with symptomatic massive rotator cuff tears retracted to the level of the glenoid who received arthroscopic SCR using dermal allograft.

The study provides a 2-year follow-up examining the healing process in correlation to functional clinical outcomes. Patients achieved an improvement of visual analog scal for pain, American Shoulder and Elbow Surgeons score, Single Assessment Numeric Evaluation score, and active forward elevation. Magnetic resonance imaging and ultrasound showed that dermal grafts were intact, attached, and vascularized ≥1 year after surgery. These findings demonstrate that the 3-mm allograft ≥1 year after the surgery continues doing the function of descending the humeral head, achieving the restoration of glenohumeral joint position, and improving contact pressures. Previous studies reported short-term factors associated with failure of SCR,[3] but more studies with larger numbers of patients and longer follow-up periods are necessary to better identify the patients who will and will not benefit from this technique. Additionally, studies with a follow-up of >2 years are needed to see if there is deterioration of the result, the progression of rotator cuff arthropathy, and the development of glenohumeral arthritis.

In our experience, patients who best benefit from SCR are those with Hamada grades 1 and 2, <65 years old, and without pseudoparalysis. However, we are not

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The authors report that they have no conflicts of interest in the authorship and publication of this article. Full ICMJE author disclosure forms are available for this article online, as supplementary material.

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0749-8063/201960/$36.00

https://doi.org/10.1016/j.arthro.2020.12.182

very strict about age: if the patient is >65 but very active, we consider SCR. In our experience, ≤70% of the times that a SCR surgery has been indicated, a direct complete repair of the supraspinatus tendon was achieved during surgery. Therefore, we can say that it is a technique with a very restricted indication. In our experience, reverse shoulder arthroplasty (RSA) is not the best option for patients <60 years old, because their preoperative expectations are often not achieved; in addition, many young patients prefer a joint preservation technique even though they are informed of the risk of treatment failure. On the other hand, some authors discuss the cost-effectiveness of SCR, which suffers from the lack of long-term clinical good outcomes compared with partial rotator cuff repair, RSA, or tendon transfer.[4]

The debate on the best type of graft is still open. Each group using fascia lata or acellular dermal allograft shows their best results, with fewer complications.[4] The biomechanical studies of fascia lata show superiority to dermal allograft,[5] but superiority of clinical outcomes has not been shown with any graft type.[6,7]

The tension of the graft is another important point of debate, since fascia lata does not show the same behavior as acellular dermal allograft. In biomechanical tests, the length of the fascia lata does not change, whereas the dermal allograft undergoes 15% elongation.[5] It is very interesting how, in their study, Mihata et al.[5] gave importance to the measurement and fixation of the graft, placing the arm in a certain position. Of course, if the graft is left unstressed, it won't do its job, and if it is too tight, it will break. Taking into account that each tissue behaves differently and that a small variation in the position of the arm can vary the tension, finding the optimal tension is a complicated but very important point.[8]

We started doing the SCR technique with fascia lata, reinforcing it by closely binding the layers with sutures in the body and edges to achieve sufficient stiffness. Currently, we also use acellular dermal allograft with suture reinforcement to create a stiffer graft, because we find it easier to manage, and we get a less elastic graft. In our experience, therefore, it is not necessary for a 6- to 8-mm graft to achieve sufficient stiffness to restore glenohumeral stability without tears. Important points in favor of acellular dermal allograft are reduced donor-site morbidity and a simpler surgical procedure. Because we have not seen any worsening of clinical outcomes in the follow-up of our patients, and studies like this support our results, we will continue carrying out this technique.

Further level I and II studies are needed, and we also have to see the evolution of these patients to discover if this technique is a fad or here to stay. Pashuck et al.[2] performed 2-year follow-up after SCR without a big sample; despite these limitations, their study is valuable and useful to show that the technique is a good tool for active patients with massive irreparable rotator cuff tear.

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