Current Trends for the Management of Primary and Repairable Rotator Cuff Tears

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Rotator cuff (RC) tears is currently one of the most frequent pathologies in trauma consultations and the most frequent in subspecialty consultations.[1] This has translated into a significant increase in terms of indexed publications related to RC.

In the course of the last 15 years, in the literature, it has been possible to differentiate and subclassify in a more appropriate way the pathology of RC, not only in its etiology (traumatic/degenerative, intrinsic/extrinsic), as well as in the biological potential of healing, in conservative management vs. surgery and in the prognosis of the repairs according to the size of the rupture and associated muscular trophic alterations, conditioning that in the present, a term coined by Neer in 1983, "irreparable RC ruptures" is used with greater frequency.[2]

A topic of debate without consensus at the moment is the use of a single row (SR) or double row (DR) for primary repairs. With the advancement of the technology of the anchors, sutures and fixations, biomechanical studies have shown that the DR presents a smaller gap at time 0, that the initial resistance of the trans-bone equivalent DR construct (TOE, sutures linked between the ancles) is a third more powerful for the DR and increases the resistance to the maximum load by 48%.[3]

Despite the existence of an important number of studies with an adequate level of evidence, at the moment no significant clinical advantage has been found in comparing SR and DR for the repair of RC. In recent years, it has been seen with greater frequency that subdividing the study groups according to the size of rupture offers a clearer vision in relation to the indications of the DR. Saridakis et al.[4] carried out a systematic review of clinical studies comparing SR and DR, dividing the cases by rupture size and documenting that the ruptures greater than 3 cm had fewer re-ruptures in a 10-year follow-up with magnetic resonance imaging (MRI), without clinical differences. This last point can change in the future given that with more randomized studies with adequate number of cases and using the subdivision criteria, perhaps strong evidence can define which ruptures have an indication of a DR observing outcomes and repair survival at 10 years.

Another very relevant topic in the current discussion is the increase in the repair and improvement of the biological environment during the repair.

As for biological augmentation, a technique that has aroused interest, accompanied by good results in the literature, is the augmentation with the use of the large biceps tendon, aimed at reducing tension and increasing subacromial tissue in retracted tears, with the advantage that it is possible to perform the same surgical procedure without techniques other than during the traditional arthroscopic ones, in which we seek to interpose tissue between the RC, acromion and greater tuberosity. Cho et al.[5] carried out a case control study comparing ruptures of more than 3 cms with and without interposition of the biceps. They documented that the clinical results were similar: in the group with augmentation, more strength was registered in the anterior elevation, internal and external rotations ($p = 0.001$). They also observed greater healing in the group with augmentation in evaluation with MRI at one year of surgery (58.3 vs. 26.3%, $p = 0.36$). In my clinical practice, in ruptures greater than Patte II associated with Goutallier II fatty infiltration, augmentation of the biceps for this purpose is associated and not only in those medialized repairs. Currently, there is no

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consensus on the matter, but it is a good alternative to optimize the local biology of the repair.

To enhance the local biological environment for "The Crimson Duvet" procedure has been described by Snyder et al.[6] in an attempt to optimize biologic local environment enhacement. Performing microfractures in the greater tuberosity concomitant to RC repair would offer a greater number of local growth factors, optimizing local biology. Li et al.[7] performed a comparative meta-analysis between RM repair studies with and without microfractures. They noted no difference in overall clinical outcomes, being documented that the rate of re-rupture was lower for the group with microfractures ($p < 0.001$).

In a recent study by a local group, Toro et al.[8] carried out a prospective randomized study of 123 patients, dividing them into groups with and without microfractures. They confirmed a healing of 85.11% in the control group and 93.7% in the group with microfractures ($p = 0.19$). All patients improved their postoperative functional scores with no differences between groups. Again, perhaps in the future with more N of patients, these differences may reach statistical significance. Performing microfractures is an innocuous procedure, which is carried out in the same surgical act without the use of implements that increase the costs of surgery. Technically, it is recommended to carry out the microfractures as far away from the area where we will place the anchors and 5 mm apart from each other, in order to reduce the risk of fracture of the footprint surface.

Another point discussed in recent years was the use of platelet concentrate (PC) in RC repairs. Initially, there was a lot of interest and enthusiasm in the use of PC to achieve the goal of biological optimization, but over time, no significant clinical benefits have been documented with its use. This has been changing little by little in the last period, since both clinical studies and meta-analyses have been published that suggest that the use of PC with platelet-rich plasma (PRP) results in better healing for small, medium and mainly large tears ($p < 0.05$), both for complete or partial healing and improvement of functional scores.[9]

It is possible that the use of PC is beneficial during primary RM repairs, especially in large degenerative tears, where the biology is more affected, aiding healing and mainly reducing pain in the postoperative phase.

The future of RM repairs points to defining which patients will benefit from which specific technique and whether it is necessary to systematically perform biological augmentations in repairs to achieve better healing and consequently better clinical results, at least considering general aspects recently discussed.

At the moment, there is a lack of studies with powerful levels of evidence to respond with certainty to what has been described and thus express these approaches in a more concrete way and not only as clinical recommendations with type V evidence.[10]

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