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CORR Insights®: No Regeneration of the Human Acetabular Labrum After Excision to Bone

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Where Are We Now?

The acetabular labrum plays an essential role in hip joint stability and function by distributing load and sealing the joint. Recent studies [3, 4, 6, 7] have suggested that acetabular labral tears caused by femoroacetabular impingement (FAI) are a

common cause of pain and dysfunction in this patient population, and may contribute to the development of early degenerative hip arthrosis. Both labral excision/debridement and labral preservation/repair techniques have been to help treat FAI. To date, most of the comparative studies have shown better short- and mid-term pain and function in patients treated with labral repair when compared with those treated with selective labral debridement [3, 4, 7].

However, in contrast to tears at the chondral-labral junction that are amenable to repair, tears within the labral substance have limited healing capacity secondary to the hypovascularity of this area [2]. In cases where the labrum cannot be repaired, labral reconstruction is an option, especially in younger patients. Labral regrowth after resection has been reported both in animals [5] and humans [1], theoretically

obviating the need for a technically challenging labral reconstruction. Abrams et al. [1] reported on 24 patients who underwent a hip arthroscopy 2 years after open hip surgical dislocation with labral debridement for treatment of FAI. All patients demonstrated regrowth of the labrum in the area undergoing previous debridement [1]. The authors found homogeneous regrowth in 21 of 24 patients, with inhomogeneous regrowth noted in three of 24 patients. Labral scarring altering normal labral biomechanical properties and function was noted in four of 24 hips. The presence of scar tissue adversely affects labral function in distributing load and sealing the joint.

In the present study, Miozzari and colleagues retrospectively evaluated postoperative MRI hip arthrograms and hip function in nine patients who underwent labral excision to the bony rim for nonreparable lesions. In contrast to Abrams et al. [1], no regrowth of a structure equivalent to normal labrum was noticed 3 to 7 years after segmental resection of the acetabular labrum. More specifically, the authors

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recorded segmental defects with no tissue regrowth in six hips. Miozzari and colleagues observed that areas of low-density scar replaced some of the resected labrum in the three patients without segmental defects. The authors also noted bone growing into the areas of labral excision in five. Adhesions between the capsule and the new tissue were common. These contradictory findings between the two studies can be explained by the hypothesis that arthroscopy may overestimate the extent of labral regeneration following labral excision in areas where the newly formed, low-density scar tissue or bone are covered by fibrous tissue or a layer of capsule. The findings by Miozzari and colleagues were similar to those made in a previous study [5] by the same authors in a selective labrum resection sheep model. In that study, dense, fibrous scar tissue without normal collagen structure filled the defect.

Where Do We Need To Go?

Although a previous study [1] employing second-look arthroscopy suggested that a resected acetabular labrum can spontaneously regenerate, the article by Miozzari and colleagues suggests that this is only partially true since the regenerated tissue does not

have the histologic appearance, and most importantly, the biomechanical properties of the original labrum. This is consistent with the short- and mid-term clinical studies that found patients undergoing labral repair have less pain and better function than those who had labral resections [3, 4, 7]. However, long-term studies evaluating functional outcomes following labral repair are lacking.

How Do We Get There?

As was the case with repair of the glenoid labrum and menisci, future studies regarding the efficacy of repair versus selective resection of the acetabular labrum should focus on prospective, randomized clinical trials. However, with the growing awareness of the importance of the labrum, this work by Miozzari and colleagues confirms that we should not be comfortable randomizing patients in such studies to treatment with labral excision. When the labrum cannot be repaired, such as in patients with intrasubstance damage, revision surgery after debridement, labral calcification, or labral hypoplasia, reconstruction is a viable option. Further research is needed to evaluate pain and function in long-term studies of patients treated with either labral repair or reconstruction, especially in terms of

durability and function of the healed or reconstructed labrum.

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