

Bone Healing Potential of Fascia Lata Autografts

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COMMENTARY

In our experience, we found a unique pattern of re-tear of the fascia lata autograft (FLA) remaining in the greater tuberosity of most shoulders after FLA patch procedure for large to massive rotator cuff tears on MRI evaluations. We performed a second-look arthroscopy after the FLA patch procedure in one shoulder, and harvested the FLA remaining on the greater tuberosity at the time of reverse shoulder arthroplasty after the patch procedure as revision surgery to macroscopically and histologically analyze the FLA in another two shoulders. Based on these radiographic and histological results, we concluded that a fresh cellular FLA has good to excellent bone healing-potential.

To the best of our knowledge, our study is the first one to histologically evaluate the greater tuberosity and autologous grafted fascia lata harvested en bloc from patients who underwent an fascia autograft patch procedure [1]. In the study, histological findings revealed that the fascia-bone insertion included four zones, fascia (like tendon), nonmineralized fibrocartilage, mineralized fibrocartilage, and bone, which is similar to the normal cuff tendon-bone junction. Furthermore, the modified tendon maturing scores of the fascia-bone interface exceeded 75% of the control score (one 79-year-old female patient at the time of RSA after failed open reduction of internal fixation for a 4-part proximal humeral fracture to assess the histology of the rotator cuff tendon insertion) at the tendon to bone interface. Based on magnetic resonance imaging (MRI), re-tear cases were divided into type 1 (the graft did not remain in on the greater tuberosity) and type 2 (the graft remained on the greater tuberosity). The present MRI findings showed that 62 of 69 shoulders (35 intact repairs, 27 type 2 shoulders) had a low intensity area on the anterior greater tuberosity. Because arthroscopic second-look finding in the failed FLA procedure patient with a type 2 re-tear showed that the graft remained on the anterior greater tuberosity at 8 months postoperatively after primary FLA patch surgery, we expected that the 62 shoulders would have the FLA firmly fixed on the greater tuberosity [2]. Therefore, the MRI results support that the low intensity area on the anterior greater tuberosity indicates FLA remaining on the anterior tuberosity where the graft was attached at the time of FLA patch surgery. Based on these radiographic and histological results, we concluded that a fresh cellular FLA has

good to excellent bone healing-potential.

Indeed, there remains much controversy regarding which graft material has better healing rates and clinical outcomes after graft reinforcement in large-massive rotator cuff tears. In a systematic review by Ono et al. concluded that, while several factors other than graft material, such as tear size, approach (open vs arthroscopic), and indications (augmentation vs. bridging), may be important considerations, the graft type affected clinical outcomes. For example, in bridging technique, healing rates differs in grafts (fascia autograft: 73.1%, allograft: 59.0%, xenograft: 72.7%, synthetic graft: 88.2%) [3-7].

Our study would support that superior capsular reconstruction (SCR) using FLA (graft fixation between the glenoid and greater tuberosity) theoretically is beneficial to FLA patch surgery (graft fixation between native tendons and greater tuberosity). In the present study, 28 of 34 shoulders (82.4%) had torn between the FLA and native cuff tendons and 62 of 69 shoulders (89.9%) had the FLA remaining on the greater tuberosity. Indeed, 50.7% of our intact repairs was inferior to 83.3% of intact repairs after SCR by Mihata et al. [8]. However, one systematic review by Lin et al. [9]. Concluded that graft bridging showed significantly better clinical and functional outcomes postoperatively than SCR. In addition, they concluded that the available fair-quality evidence suggested that graft bridging might be a better choice for large to massive RCT. However, they also concluded that more high-quality randomized controlled studies are required to further evaluate the relative benefits of the 2 procedures, because there is a lack of high-quality comparative evidence because most studies included were at level 4.

Graft re-tear rates of superior capsular reconstruction (SCR) for irreparable rotator cuff tears also differ on graft type. Denard et al. [10] reported 55% of graft tear after SCR using dermal allograft, although Mihata et al. [8] reported 16.7% of graft re-tear after SCR using FLA. One biomechanical cadaveric research [11] has directly compared the use of fascia lata allografts with humeral dermal allografts in SCR [11]. It has shown that superior translation of the humerus was completely restored with fascia lata allograft and only partially with dermal allograft. Therefore, material of fascia lata and bone-healing potential of FLA might affect structural

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difference in the two studies.

Considering our results and published data, we recommend FLA as a good graft option for graft surgery. The advantages of using a fresh cellular autograft include a low risk of infection and aseptic inflammatory reactions. However, harvesting FLA is invasive for thigh. Therefore, further comparative study of graft materials should be established.

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