

Patch augmentation in patients with large to massive rotator cuff tear

Du-Han Kim, Chul-Hyun Cho

Department of Orthopedic Surgery, Keimyung University Dongsan Hospital, Keimyung University School of Medicine, Daegu, Korea

For rotator cuff tears greater than 3 cm, the re-tear rate was higher than 30% [1], while tears greater than 5 cm showed a re-tear rate higher 40% [1]. To overcome this problem and improve patient outcomes, several techniques have been introduced such as partial repair, biceps re-routing, balloon spacer insertion, and patch augmentation. Among them, recently, patch augmentation with rotator cuff repair has focused on the treatment of large to massive rotator cuff tear. After outcomes of patch augmentation were reported in the 2000s, there has been increasing interest in this technique to achieve successful rotator cuff repair [2]. The optimal aim of rotator cuff repair should be a healed tendon-bone interface, which can be achieved using one of several types of graft material. Xenograft (porcine small intestine or porcine dermal tissue) is no longer on the market because of sterile inflammatory reactions [2,3]. Synthetic grafts have been reported to have good outcomes because they have low re-tear rates and no tissue-related reactions. However, reports are limited, and available data are lacking to allow definitive conclusions. Due to advanced manufacturing and tissue engineering techniques, synthetic grafts are expected to receive more interest [4]. Most recent publications have reported on the use of acellular dermal allograft. However, in countries where this is not available, autograft (fascia lata or quadriceps tendon) could be an option [5,6].

Patch augmentation is performed differently according to cuff

integrity or repair situations. If a torn cuff tendon cannot be advanced to the tuberosity, the patch must span the gap between the tendon and the tuberosity as a bridge. If the tendon can be completely advanced to the native footprint, a patch graft is used as an onlay augmentation [2]. If the torn cuff is completely detached from the greater tuberosity, the patch could be placed between the glenoid and the tuberosity, known as “superior capsular reconstruction” and different from patch augmentation.

In a systematic review, augmentation did not show improved outcomes and healing rates compared with bridging [7]. However, pain score was significantly improved in the bridging group [7]. This result may be due to intraoperative situations and surgeon factors. Some surgeons may choose to complete repair using a mobilizing technique while others may choose partial repair with bridge augmentation. Also, a higher-tension repair could lead to pain or re-tear [8]. Therefore, proper cuff repair with or without augmentation (bridge or onlay) is a basic requirement and crucial to a successful outcome.

In terms of re-tear rate, patch augmentation in rotator cuff repair showed a lower rate than repair without patch augmentation, according to a recent meta-analysis study [9]. However, the effect on clinical outcomes was not clinically meaningful. To achieve promising outcomes, it is imperative to choose appropriate patients.

Received: January 24, 2023 Revised: February 7, 2023 Accepted: February 8, 2023

Correspondence to: Du-Han Kim

Department of Orthopedic Surgery, Keimyung University Dongsan Hospital, Keimyung University School of Medicine, 1035 Dalgubeol-daero, Dalseo-gu, Daegu 42601, Korea

Tel: +82-53-258-4772, Fax: +82-53-258-4773, E-mail: osmdkdh@gmail.com, ORCID: <https://orcid.org/0000-0002-6636-9340>

Financial support: None.

Conflict of interest: Du-Han Kim is an editorial board member of the journal but was not involved in the peer reviewer selection, evaluation, or decision process of this article. No other potential conflicts of interest relevant to this article were reported.

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de Andrade et al. [9] found that the range of shoulder-forward flexion tended to be lower with patch augmentation. Choi et al. [10] reported that clinical outcomes and range of shoulder motion did not differ between the patch augmentation group and repair only group. However, others have reported that forward elevation was increased, suggesting that patch augmentation has not yielded promising results for shoulder range of motion [11,12]. Therefore, caution is needed in applying patch augmentation to cuff tear patients with pseudoparalysis.

Patch augmentation may be one of the preferred options for treating large to massive rotator cuff tears. However, when choosing a surgical option among various techniques, surgical success factors (re-tear rate or footprint coverage) and patient-based outcomes (minimum clinically important difference or substantial clinical benefit) must be considered. Further studies are necessary to better define the indications for patch augmentation using onlay or bridge technique.

ORCID

Du-Han Kim <https://orcid.org/0000-0002-6636-9340>
 Chul-Hyun Cho <https://orcid.org/0000-0003-0252-8741>

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