



# The accordion suture technique: A modified rhinoplasty spreader flap



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## ARTICLE INFO

### Article history:

Paper received 24 December 2014

Accepted 27 March 2015

Available online 9 April 2015

### Keywords:

Spreader flap

Spreader graft

Accordion

Rhinoplasty

## ABSTRACT

In rhinoplasties, a spreader flap is a widely used alternative to dorsal reconstruction with spreader grafts; however, it has a limited ability to provide sufficient nasal dorsal width. The upper lateral cartilage (ULC) thickness is four times thinner than a spreader graft. This report presents an accordion suture technique for the ULC that involves simple sutures which fix each ULC (3 times folded) to the septum. We performed this technique in 64 primary rhinoplasties, and the patients were followed up for approximately 18 months. The patients completed a questionnaire 12 months postoperatively, and reported marked satisfaction with the aesthetics and function. Furthermore, rhinomanometric analysis showed that nasal airway resistance (NAR) decreased significantly in the postoperative period.

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## 1. Introduction

The presence of a nasal hump is one of the most common indications for rhinoplasty (Springer et al., 2009). After excising the hump, there are various ways to reconstruct the nasal dorsum using inlay and onlay grafts (Sheen, 1984; Constantian and Clardy, 1996; Skoog, 1966; McKinney, 1996). Spreader grafts are preferred for better functional and esthetic results (Constantian and Clardy, 1996; Rohrich et al., 2004; Howard and Rohrich, 2002; Arslan et al., 2007). This technique requires extra cartilage graft material, and frequently the nasal septum is preferred as the donor area. However, septal surgery increases the risk of complications, especially if no septal pathology is evident (Teichgraeber et al., 1990).

The spreader flap technique is another popular option for dorsal reconstruction (Oneal and Berkowitz, 1998). The reliability of this technique depends on the thickness of the ULC material used. Usually, that thickness is inadequate to afford the required dorsal width when the cartilage is folded. To obtain sufficient dorsal width, various modifications of the technique have been described. Thickness can be increased by rolling rather than

folding the cartilage, and by use of special suture techniques (Seyhan, 1997; Acarturk and Gencel, 2003; Fayman and Potgieter, 2004; Byrd et al., 2007; Gruber et al., 2007; Neu, 2009; Manavbaşı and Başaran, 2013). The accordion suture technique features threefold bending of each ULC and formation of a nasal dorsal roof from seven cartilage layers, with a septum. This multi-cartilage approach solves the dorsal width problem; a width of 8 mm is attained. Furthermore, the cartilage “memory” affords resistance to bending, increasing the strength of the internal nasal valve.

The accordion suture technique was used to solve the dorsal width problem in 64 patients treated between November 2010 and December 2013. In the present study, we describe the accordion suture technique and present quantitative data on 64 patients who underwent primary rhinoplasty using the procedure.

## 2. Material and methods

### 2.1. Operative procedure

Incisions were made for an open rhinoplasty, and a tip flap was elevated. The nasal dorsal cartilage and bone were dissected from the skin subperichondrially and subperiosteally. We did not dissect the ULCs from the nasal bone, to prevent development of the “inverted V” deformity.

Only the dorsal and caudal septal areas that were to be excised were dissected from the intranasal mucosa. Also, the transition area

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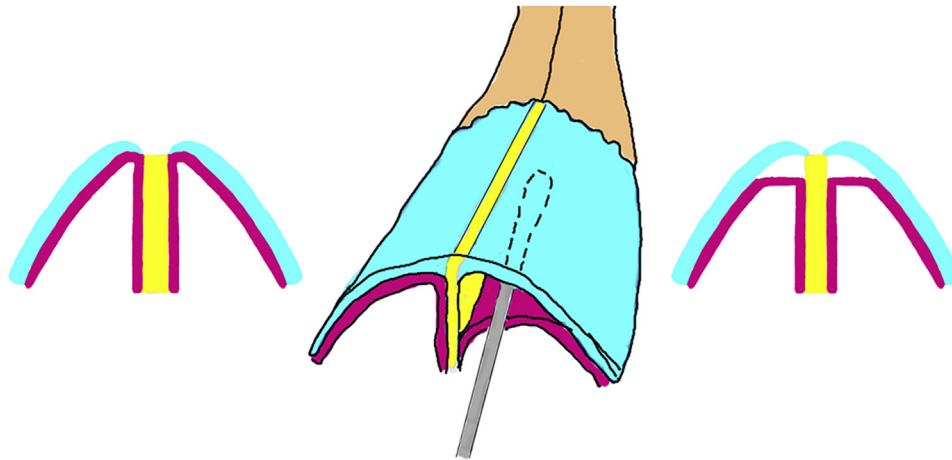


Fig. 1. Partial submucosal dissection of the upper lateral cartilage and septum.

of the septum and the ULCs was dissected submucosally (Fig. 1). This maneuver prevented damage to the nasal mucosa during separation of the septum and the ULCs.

After dissecting the anterior septum and ULC from the intranasal mucosa, the ULC was separated from the border of the septum (Fig. 2). Both ULCs were dissected from the intranasal mucosa for approximately 3 mm to allow for an accordion suture (The precise distance varied individually, depending on the extent of hump excess) (Fig. 3). The cartilage and bone hump were excised using scissors and an osteotome (Fig. 4).

## 2.2. Suture technique

The accordion suture technique was applied to three distinct points on the septum and ULCs using 5/0 polypropylene sutures:

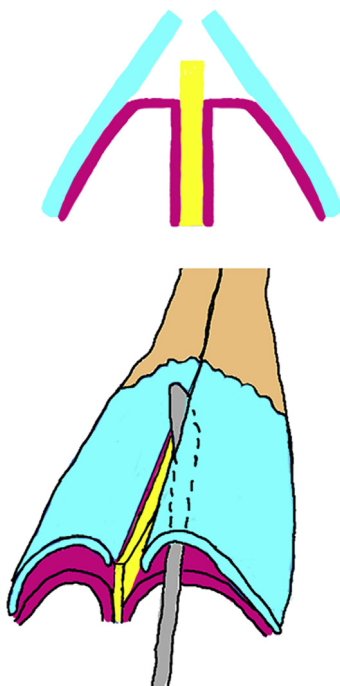


Fig. 2. Upper lateral cartilage (ULC) separation in the septum.

cephalic (just below the keystone area), middle, and caudal third. The middle suture was placed first, followed by the cephalic and caudal sutures.

For each suture; the needle was passed seven times on the same horizontal axis through the full thickness of the cartilage (three times from the right ULC to the septum three times from the septum to the left ULC); this is the accordion suture technique. Each suture was inserted carefully to avoid creation of excessive tension on or deformation of the ULCs. Each suture was loosely knotted. A step-by-step description follows, assuming that suturing commenced at the left ULC:

Step 1: A suture needle was inserted dorsal to the nasal direction of the left ULC, at the border of the dissected nasal mucosa (Fig. 5a).

Step 2: A suture needle was inserted nasal to the dorsal direction of the left ULC at a point 1 mm medially distant from the first insertion point (Fig. 5b).

Step 3: A suture needle was inserted dorsal to the nasal direction of the left ULC at a point 1 mm medially distant from the second insertion point (Fig. 5c).

Step 4: A suture needle was passed transversely to the septum (approximately 1 mm below the dorsal border of the septum) and thus at the same level with reference to the dorsal line of the septum at which the threefold-folded ULC was formed in the first three steps (Fig. 5d).

Next, Steps 3, 2, and 1 were applied to the right ULC and the sutures knotted loosely. After the middle, cephalic, and caudal sutures were placed, the dorsal surfaces of the ULC and septum were covered with perichondrium that had been dissected during preparation for suturing (Fig. 6).

The lateral osteotomies, lower lateral cartilage procedures, and skin closure were performed in a routine manner. An internal silicone splint and external thermoplastic splint were applied and worn for 1 week.

## 2.3. Patients and data

Between November 2010 and December 2013, a total of 64 patients (45 female and 19 male) with nasal dorsal humps underwent open rhinoplasties. The average hump reduction was 3 mm (range, 2–3.5 mm). The median patient age was 24 years (range, 19–33

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