**Objective:** To use the trimmed cartilage as a support material for both internal and external valves.

**Methods:** The lateral crural turn-in flap (LCTF) technique is simply to make cephalic trimming of the lateral crura and turn it into a pocket created under the remaining lateral crus. Twenty-four patients with lateral crura wider than 12 mm and in whom this technique was applied took part in this study. The trimmed cartilage was used to reshape and/or support the lateral crus and the internal valve by keeping the scroll intact. The support and suspension of the lateral crura “sandwich” helped not only to prevent stenosis of the internal valve angle but also to widen it in some cases.

**Results:** The LCTF has been used in 24 patients to reshape and/or add structure to the lateral crus with great success. The internal valve was also kept open by keeping the scroll area intact, especially in 1 patient with concave lateral crura in whom this technique helped to widen the internal valve angle.

**Conclusions:** This study shows that the LCTF can be used to reshape and add structure to the lateral crus and to suspend the internal valve. Although it is a powerful technique by itself in functional rhinoplasty, it should be combined with other methods, such as spreader flaps/grafts or alar battens, to obtain the maximum functional result.

lateral crural grafts, and/or alar battens. In this study, a technique that can overcome some of the abovementioned structural problems of the lateral crura is presented.

METHODS

This technique was used in 24 cases (13 women and 11 men) who underwent surgery from December 2008 through January 2011. The mean duration of follow-up was 14 months (range, 8-24 months). The mean age was 27 years (range, 19-50 years).

All patients underwent surgery under general anesthesia. After the local anesthetic was applied to the incision sites and dissection planes, an inverted-V incision and marginal incisions were performed. The columellar flap was elevated by using sharp curved scissors. Then the columella, domes, and lateral crura were dissected free of the surrounding soft tissues. By doing so, an undistorted view of the lower lateral cartilages could be obtained, which was very important in decision making. At this point in the operation, the shape, orientation, resiliency, thickness, width, and symmetry of the lateral crura were evaluated. In almost all of the patients, I was willing to leave at least 7 mm of lateral crus on both sides in women and 8 mm in men. To apply the technique presented herein, the width of the lateral crura had to be at least 12 mm (Figure 1). In this technique, all the soft tissues over the lateral crura were dissected away to put the whole lateral crus under direct exposure. The attachment of the lateral crus with the upper lateral cartilage (ULC) was also cut in the first 5 cases. The scroll area was kept intact in subsequent cases so as not to disturb the internal nasal valve angle. The underlying skin of the lateral crus was first injected with lidocaine hydrochloride containing adrenaline (1:100,000) for hydraulic dissection and hemostasis. Then it was dissected from the lateral crus, approaching from the cephalic border while keeping 1 to 3 mm of skin attached to the caudal border. A caliper was used to measure a distance of 7 to 8 mm from the caudal border of the lateral crus (the width to leave behind), and a marking pen was used to draw a straight line from the lateral border of the lateral crus (Figure 2). A No. 11 blade was used to make a partial cut on the outer surface of the lateral crus by following a straight line, the free cephalic portion was turned in, and the folded cartilage was sutured by using three 5-0 PDS mattress sutures, leaving the knot on the lateral surface of the lateral crus. The first suture was put into the midline, the second closer to the dome, and the third closer to the lateral margin. When these sutures were tied, both segments of the lateral crus became joined in a sandwich fashion. The width of the cartilage left behind was usually 7 to 8 mm, and the width of the turned-in cartilage was at least 4 to 7 mm, meaning that the lateral crus could be supported almost throughout its entire length. The detached skin was then sutured to the lateral crus by 5-0 rapid Vicryl mattress sutures to close the dead space and to help the skin to reattach to the lateral crus.

RESULTS

The lateral crural turn-in flap (LCTF) has been used in 24 cases. In 12 of these patients the lateral crura were found to have concavity (Figure 3), whereas 7 had convexity. In 16 of these 19 patients, the shape of the lateral crus was turned into a slight convexity, which was a desirable result. In the remaining 3, it stayed slightly convex because of irregular shape of the lateral crus. In 5 of the cases, the lateral crura were very thin and weak, and the turned-in flap was used to reinforce the remaining lateral crus while refining the ala. In these 19 patients, the lateral crura were moderately thick in 15 patients, whereas they were remarkably thick in 4 patients. The most striking correction was noted in this latter group because the turned-in flap was strong enough to eliminate extreme concavity or convexity. In 1 of these patients with concave lateral crus, after the application of LCTF, the concavity turned out to be a mild convexity, and the internal valve angle was widened owing to the pulling effect of the suspended lateral crus.

In the first 5 cases, the scroll area was also detached so as to turn the cephalically trimmed piece inward throughout the whole length of the lateral crus. In the remaining 19 cases, the scroll area was kept intact to prevent possible collapse at the internal valve angle by scar contracture. In 1 case in which the patient had a 1-sided severe alar collapse during quiet breathing, after the application of LCTF, a mild collapse persisted, although it did not cause any kind of nasal obstruction.

COMMENT

The turn-in folding of the cephalic portion of the lateral crus to support the alar rim was described in 2007 by Telioğlu et al, who reported satisfactory results in all cases. Murakami et al also reported a similar technique to reinforce the alar cartilage after cephalic trimming. The technique described herein was adapted from these 2 studies.
but modified starting from the first case. What was the reason for this modification? It was thought that the lateral crus could be supported if the trimming was done in a linear fashion, and the turned-in flap could be long and wide enough to support throughout its entire length. That is why this technique was used only in cases in which the width of the lateral crus was at least 12 mm. Keeping in mind that this modification could cause a collapse at the nasal valve angle, a second modification was made, keeping the scroll area intact. In fact, no collapse was observed in any of the
and/or restructuring described in the literature. The most favorable as in the first 2 situations.

In conclusion, LCTF as described herein can be used to refine, reshape, and add restructure to the lateral crus. By doing so, it is a useful technique to reinforce the external valve. In reduction rhinoplasties, it not only helps to prevent the collapse but also to widen the nasal valve angle. In many instances, it is highly recommend to combine LCTF with other internal and external valve supporting procedures, such as spreader flaps/grafts, alar batten, lateral crural strut grafts, and alar rim grafts.

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REFERENCES