

Discussion of Paper Entitled “The Relation Between the Lower Lateral Cartilages and the Function of the External Nasal Valve”

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The paper entitled “The relation between the lower lateral cartilage and the function of the external nasal valve” looks at the significance of the orientation (angulation off of midline) of the lateral crura. The focus of this paper is on the diagnosis, incidence and treatment of “cephalically malpositioned” lateral crura. Sheen and Constantian [1, 2] were the first to popularize the concept. Using the external rhinoplasty approach, one can readily measure the angulation of the lateral crura as they diverge off of midline (Fig. 1). If the lateral crura diverge at an angle less than 30° off of midline, they can be considered cephalically malpositioned [3]. In this paper, the authors look at 60 rhinoplasty patients that were retrospectively reviewed to evaluate their external valve function. The authors specifically focus on the impact of the lateral crural orientation on the function of the external nasal valve and efficacy of treatment.

The path that the lateral crura take as they diverge off midline has significant impact on the tip contour and stability of the lateral wall of the nose and external nasal valve [4]. If the lateral crura move away from the alar margin and parallel to the middle nasal vault, the lateral crura become

more cephalically oriented. With this anatomic variant, the lateral wall of the nose becomes devoid of cartilage support, introducing the potential for lateral wall weakness and external valve collapse. Using video recordings, the authors clearly show how the external nasal valve can collapse upon inspiration if the lateral crura run in a cephalic orientation. Of the sixty patients studied, 37 (62%) presented with external nasal valve collapse and 23 (38%) presented with cephalic malpositioning of the lateral crura. The authors found that 74% of the patients with cephalic malpositioning also presented with external nasal valve insufficiency.

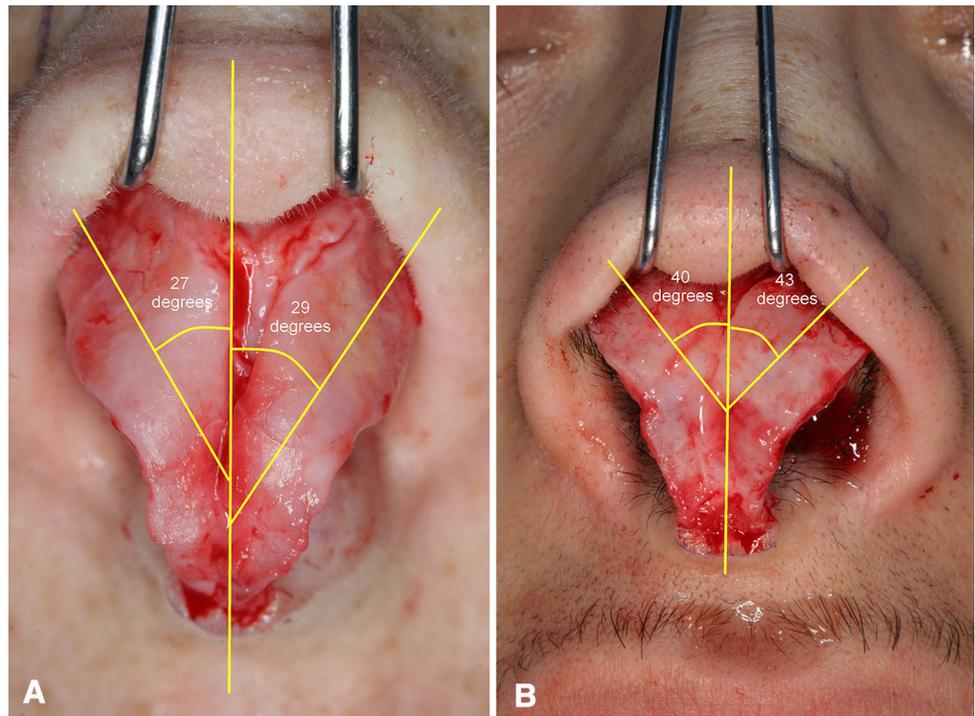
The authors demonstrated that adding structural grafts to the lateral wall was effective in treating the external valve insufficiency. The authors used lateral crural strut grafts and/or alar contour grafts to support the external nasal valve. Lateral crural strut grafts were used in 24 cases (40%) out of the 60 patients studied. The lateral crura were released and repositioned in 11 of these patients. The authors noted correction of the external nasal valve insufficiency with lateral crural strut grafts with repositioning. This was clearly demonstrated with the preoperative base views with deep inspiration showing collapse of the external nasal valve and the postoperative base views showing no collapse. The data would be even more compelling if the patients were asked to complete preoperative and postoperative NOSE questionnaires to document the patients' perception of their nasal breathing using a patient-reported outcome measure (PROM). This is a validated instrument for measuring the patient's improvement in nasal breathing [5].

It is interesting to note that with experience the author's technique changed, with a move toward more structure and increased support. This was demonstrated by the increased

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Fig. 1 **a** Lateral crura diverge off of midline at 27° and 29°, respectively. This would constitute cephalic malpositioning of the lateral crura. This patient demonstrated external nasal valve insufficiency. **b** The lateral crura diverge at 40° and 43°, respectively. These lateral crura diverge at an angle greater than 30° and are more favorable in their orientation, providing greater lateral wall support. This patient did not exhibit external nasal valve insufficiency



use of alar contour grafts in the later years of the study. Additionally, the author changed from using columellar struts to using either the tongue-in-groove maneuver or caudal septal extension grafts for stabilizing the nasal base.

The degree of cephalic positioning of the lateral crura can vary from patient to patient. The impact on lateral wall weakness and external nasal valve collapse depends on several factors. Patients with round nostrils are less likely to collapse despite having cephalically malpositioned lateral crura. Patients with “slit-like” nostrils have a much higher likelihood of external valve collapse if the lateral crura are cephalically malpositioned. The strength/thickness, width and length of the lateral crura are all factors that can also potentially contribute to the competence of the external nasal valve, not simply their degree of cephalic position/malposition. Patients with a thick alar lobule are less likely to collapse at the external nasal valve regardless of the orientation of the lateral crura. Asian patients frequently demonstrate cephalic malpositioning of the lateral crura but rarely demonstrate external valve insufficiency.

There is an additional subset of patients that have internal recurvature of the lateral crura that bulge into the vestibule and block the nasal airway (Fig. 2). In this anatomic variant, the lateral crura are long and redundant,

which is different from the lateral wall insufficiency caused by cephalically malpositioned lateral crura (even though they can coexist). Internal recurvature of the lateral crura can be corrected using lateral wall grafting or release of the lateral crura, placement of lateral crural strut grafts and replacement into the lateral wall with a convex curvature [3].

In my experience, patients with cephalic malpositioning (lateral crura diverge at angle less than 30° off of midline) are better treated with release of the lateral crura from the vestibular skin, placement of lateral crural strut grafts and repositioning into a caudally oriented pocket along the lateral wall of the nose. Other options for management include alar contour grafts [6], articulated alar rim grafts [7] and placement of lateral crural strut grafts without repositioning [8]. Sheen and Constantian [1, 2] treat cephalic malpositioning by resecting the malpositioned lateral crura and replacing the cartilages into a caudally positioned pocket. In this paper, the authors released the lateral crura, placed lateral crural strut grafts and repositioned into caudally positioned pockets while leaving the lateral crura attached at the domes. In both instances, the support in the form of the lateral crura is moved from an area of redundancy to an area of deficiency.

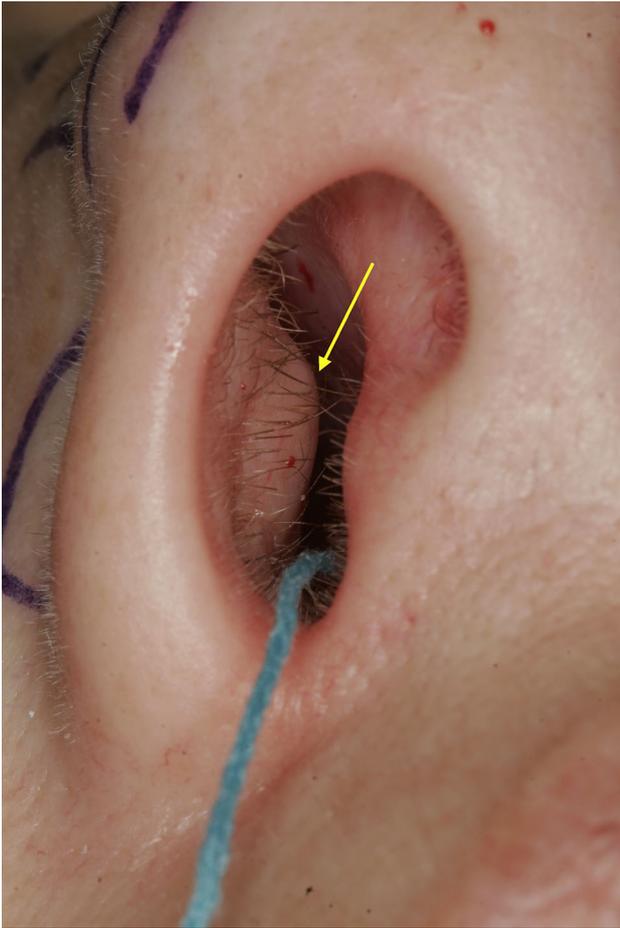


Fig. 2 Patient with internal recurvature of the lateral crura creating a bulge along the vestibular side of the lateral wall. This bulge can block the nasal airway causing nasal airway obstruction. Yellow arrow points to the prominence of the lateral wall due to the recurving lateral crus

Alar contour grafts work reasonably well for correcting external nasal valve collapse as long as the shape of the nostrils is more oval and not slit like. With the narrow nostrils, the alar contour grafts need to be more substantial to fully correct the external nasal valve insufficiency. The articulated alar rim grafts described by Davis are larger than the typical alar contour grafts and are fixed medially to the dome structure creating more stable support to the alar margin and external nasal valve [7]. Placing lateral crural strut grafts with repositioning will enlarge narrow nostrils and change the shape to a more oval contour. This can be a disadvantage of the repositioning as the need for alar base reduction increases [3, 4]. However, in cases with narrow slit-like nostrils, the changes created with the lateral crural strut grafts and repositioning actually improve the contour of the nostrils, stabilize the lateral wall and correct the external nasal valve collapse.

The authors comment on the area around the internal nasal valve that may become inadequately supported if the lateral crura are repositioned. This can be the case if the lateral crura are reduced or lack vertical height. I do not perform cephalic trim on patients that are undergoing lateral crural repositioning. In these cases, the cephalic margin of the lateral crura is preserved and acts to support the caudal margin of the upper lateral cartilage and internal nasal valve (Fig. 3). In patients that are undergoing repositioning, I perform cephalic trim only in the dome area to decrease any potential supratip fullness but do not extend the excision laterally. If there is a lack of vertical height to the lateral crura, or if the degree of repositioning is severe, then additional support to the scroll region can be added by placing a thin batten graft to cover the structurally depleted area.

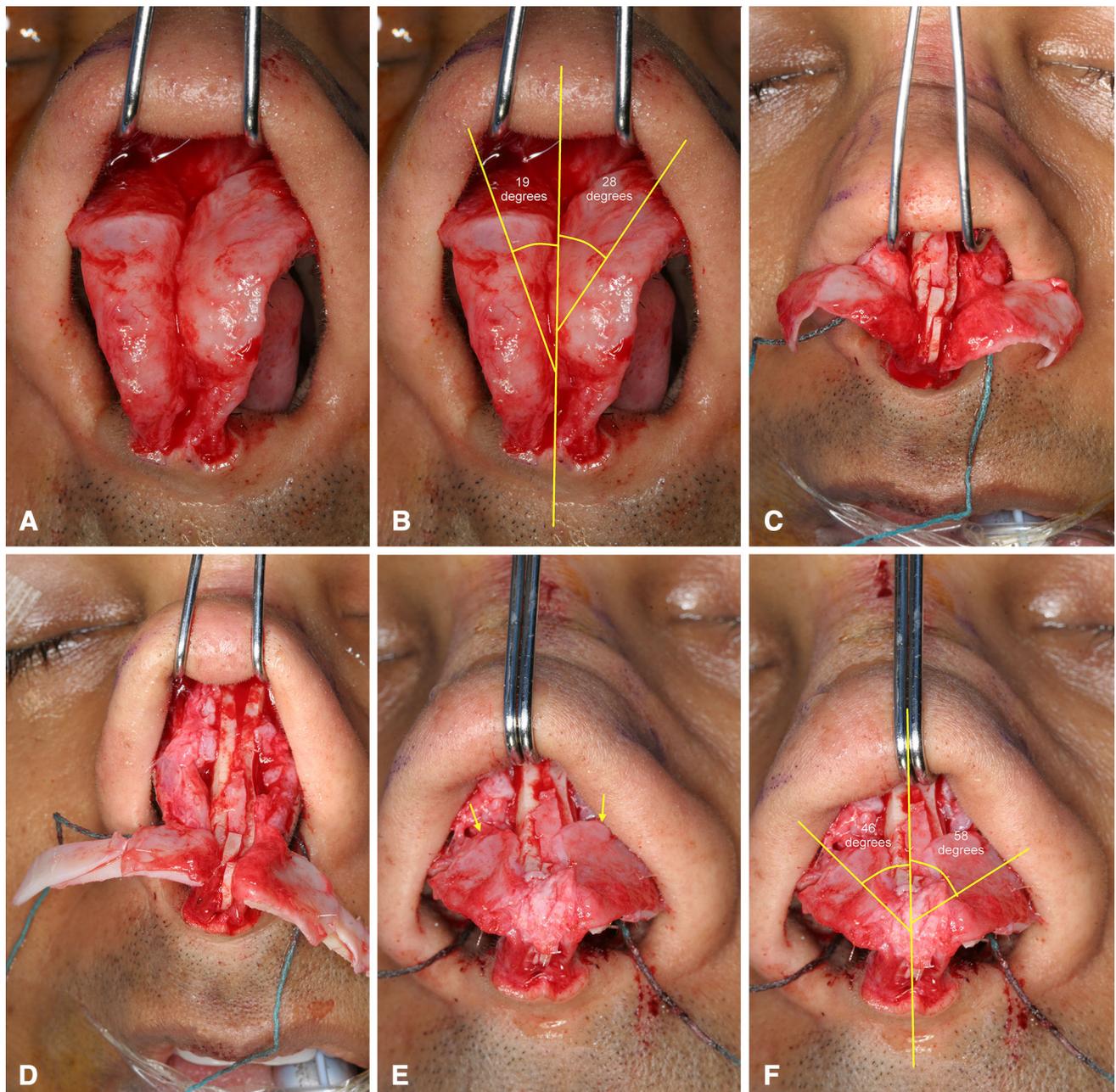


Fig. 3 Patient who underwent repositioning of the lateral crura. **a** Lower lateral cartilages are cephalically malpositioned. **b** The angulation of the lateral crura off of midline is measured at 19° and 28°, respectively. **c** The lateral crura are dissected from the vestibular skin. **d** Lateral crural strut grafts are sutured to the undersurface of the released lateral crura. **e** The lateral crura are repositioned into

caudally positioned pockets. No cephalic trim was performed. Note the extra vertical height of the lateral crura that acts to cover and support the internal nasal valve at the caudal margin of the upper lateral cartilage (yellow arrows). **f** The lateral crura are repositioned to a more favorable angulation off of midline at 46° and 58°, respectively

This paper looks at the author's incidence of cephalically positioned lateral crura and how they manage external nasal valve insufficiency. They use both alar contour grafts and lateral crural strut grafts with or without repositioning. Both are effective, but the more extreme cases of cephalic positioning with narrow nostrils may be better treated with

placement of lateral crural strut grafts with repositioning of the lateral crura.

Compliance with Ethical Standards

Conflict of interest The author declares that there is no conflict of interest to disclose.

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