

9B: NASAL VALVE SURGERY

Spreader grafts

Lateral augmentation of the middle third of the nose with spreader grafts

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Introduction

Reconstruction of the middle-third of the nose may be necessary in certain functional and/or aesthetic problems. This hidden area is relatively unknown, probably because of its lack of surgical exposure in the traditional closed endonasal approach in rhinoplasty. Overly aggressive resection of cartilage and/or bone without adequate reconstruction, may cause functional and aesthetic sequelae. The open approach enables the surgeon to analyze the pathology and to restore shape and function with the help of cartilage inlay grafts in a more sophisticated, secure and practical way.

Anatomy

The middle nasal vault is composed of the upper lateral cartilages, which are firmly connected to the overlying bony nasal bridge at the so-called 'K-area' and in the midline they are fused with the cartilaginous septum, thus forming a T-shaped construction, which supports the nasal dorsum and defines the contour of

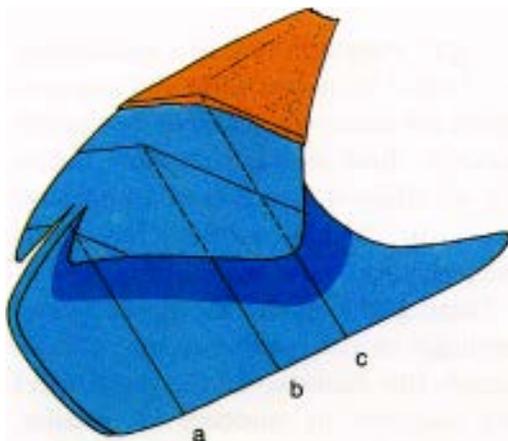


Fig. 1 Upper lateral cartilages fuse end to end with the cartilaginous septum and side to side with the nasal bones.

the nose (Fig. 1). The angle between the septum and the upper lateral cartilages increases from caudal to cranial (Fig. 2a-c).

Physiology

The region between the caudal end of the septum and the upper lateral cartilages represents the narrowest part of the entire airway and is called the nasal valve area. Inward displacement towards the septum of the caudal edge of the upper lateral cartilages on inspiration and the reverse action on expiration should be considered a physiological phenomenon (Fig. 3a,b). The capacity of the involved structures to withstand inward sucking, preventing a partial or total collapse of the nasal valve region, is of utmost importance for normal nasal breathing.

Aesthetics

The middle nasal vault plays an important role in the aesthetics of the external nose. It should be a natural flowing, non-distracting connecting area between the cartilaginous lower third and the bony upper third of the nose.

Pathology

Functional and/or aesthetic pathology may be due to either congenital or iatrogenic causes. The latter should be pre-

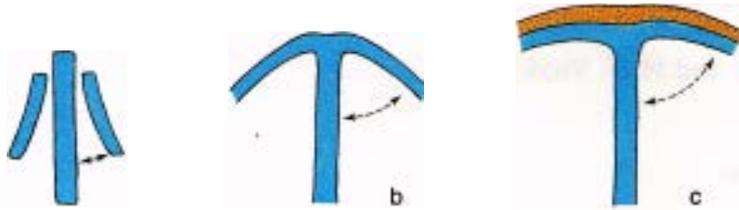


Fig. 2a-c. Schematically drawn cross sections through the nose.

The angle between the septum and the upper lateral cartilages increases from caudal to cranial.



Fig. 3. a. Nasal valve area during inspiration. b. Nasal valve area during expiration.

vented by all means. Profound knowledge of the surgical anatomy and physiology of the nose, delicate tissue handling, and the use of non-aggressive techniques for correction of the preoperatively well-defined problems, are prerequisites in this respect.

Which patients are prone to these unwanted sequelae, and how can we recognize the potential danger at an early stage. How can we prevent and treat them adequately?

A patient with a high bony-cartilaginous dorsum who seeks rhinoplasty may be a complication-prone patient. The upper lateral cartilages add mostly more to the hump than the bony part of the nose. Correction demands hump reduction with special attention being paid to reconstruction of the created open roof, not only by using infraction of the nasal bones, but sometimes by using spreader-grafts. Danger signs are short nasal bones, long flaccid and weak upper lateral cartilages, sometimes even with an almost parallel plane to the septum, and a nasal valve angle of less than the normal range of 10° - 15° , and thin over-

lying skin. In the classic 'tension nose', one or more of these features can be seen. Functional problems may also arise because of the qualitative aspects of the tissue, such as relative weakening of the tissues as seen in aging noses.

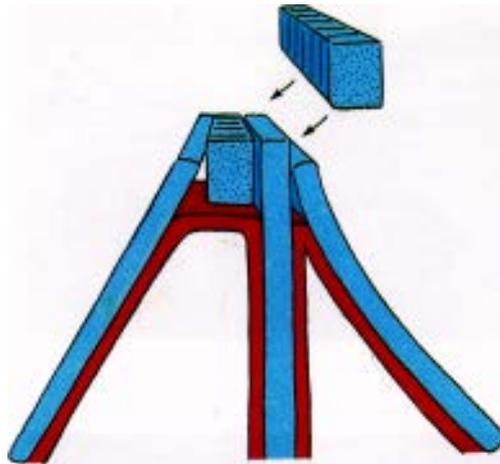
The result of not appreciating these potential problems may produce a nose with a collapsed middle third with an unnatural, operated-on appearance, and nasal obstruction due to nasal valve collapse.

Treatment

Surgical treatment of the insufficient nasal valve by means of lateral augmentation is a relatively unknown but simple concept. Lateral augmentation means uni- or bilateral insertion of autogenous single (or double) cartilaginous grafts paramedially to the septum (Fig. 4).

These grafts spread the upper lateral cartilages away from the septum. This increases the diameter of the nasal valve and decreases its tendency to collapse. Moreover, from an aesthetic point of

Fig. 4. Lateral augmentation with spreader grafts.



view spreader grafts restore the width of the nose by its mass.

As already discussed in this chapter, nasal physiology depends strongly on the condition of the nasal valve area. Grafting means repositioning, widening and strengthening of the various structures. Concurrent problems, such as caudal septal deviation, scar tissue formation, or anterior turbinate pathology, should not be overlooked and corrected in one stage.

Early publications on the use of spreader grafts in the reconstruction of the middle nasal vault advocate the closed endonasal technique for insertion. However, precise placement and fixation are almost impossible.

The open approach has greatly facilitated the placement of grafts. The use of grafts made of autogenous cartilage, derived from the nasal septum, tip, ear or costal, has proved to be versatile.

Technique

Harvesting

In the preoperative planning, grafting must be considered. Cartilage is preferably taken from the nasal septum (Fig. 5). Auricular cartilage is second choice, be-

cause of the relative weakness and curvature. If requested, resected cartilaginous hump remnants, cephalic portions of the lower lateral cartilages or costal cartilage may serve as donor material. Thus, large exposure of the surgical field, including the ear(s) or chest, may be required. If no septal pathology exists, the cartilage is harvested separately by a posterior 'Killian' incision. If the remaining cartilage strut is at least 10-15 mm in width in the caudal and dorsal region no unwanted late effects, such as loss of tip projection or saddle nose deformity, need to be expected.

Manufacturing

A stick-shaped graft is carved with a no. 11 blade, of an average size of 15 x 1 x 3 mm (Fig. 6). Some cases may require longer or broader grafts. Single or double grafts can be used if there is enough material available. It is easier to fix the various parts together in advance. Absorbable suture material or tissue glue can be used. The use of Histoacryl glue in experienced hands may be useful and time saving, but this is not entirely without dispute because of the potential histotoxicity and damage in well-vascularized tissues.

Surgical exposure

The open or external approach is used. Bilateral marginal incisions are connected with a notched V-shaped midcolumellar skin incision, after which the columellar flap is developed and the overlying skin elevated in the epiperichondrial, avascular plane, as extended as necessary (Fig. 7-10).

After exposure of the caudal end of the cartilaginous septum, the superior submucoperichondrial tunnels are developed



on both sides, with an extension underneath the upper lateral cartilages, taking care not to tear the flaps. The caudal ends of the upper lateral cartilage are identified and saved (Fig. 11 a, b).

With Converse scissors, the upper lateral cartilages are sharply dissected from the dorsal edge of the septum (Fig. 12). The length of the grafts is measured and the adapted graft will be placed on one side, between the dorsal edge of the septum and the medial border of the upper lateral cartilages (Fig. 13-14). A 5/0 Vicryl suture is used to fixate these



Fig. 5. Harvested cartilage.

Fig. 6. Different types of grafts used in open rhinoplasty: from left to right; columellar strut, bilateral spreadergrafts, tipgraft.



Fig. 7. Notched transcollellar incision at the level of the midportion of the medial crura.

Fig. 8. Dissection of the flap from the medial crura. After exposure, the colu-mellar artery is cauterized.

three layers together in the desired position, parallel to the septum, with a mattress suture technique (Fig. 15a,b). The same procedure is followed for the contralateral side.

The final dorsal refinement may take place at the end of the operation. All other rhinoplastic manoeuvres can be carried out before insertion of these particular grafts.

The septum is closed with a running hemostatic suture, mattress suture or splints. The supratip dead space is closed with 4/0 catgut on a straight needle, to

Fig. P. The lower lateral cartilages in their mutual relationship. Note the asymmetry at the level of the domal region.



Fig. 10. The interdomal ligament is divided. An avascular plane is found and blunt and sharp dissection is used to expose the nasal dorsum.



Fig. 11. The cartilaginous vault. *a:* Dissection of the perichondrial sheet covering the upper lateral cartilage. *b* Elevation of bilateral mucoperichondrial septal flaps.



prevent a soft tissue 'poly-beak' formation (Fig. 16). The skin is redraped and meticulously closed in one layer with 6/0 nylon sutures (Fig. 17a,b). The marginal

incisions are closed with 5/0 fast absorbing Vicryl sutures. After compression of the nasal dorsum and the tip, to diminish the chance of hematoma, a double layer



Fig. 12. Converse scissors are used to separate the upper lateral cartilage from the cartilaginous septum.

Fig. 13. Spreader graft inserted on the left side.



Fig. 14. A slight curvature to the left of the graft after cross hatching the graft. The medial border of the upper lateral cartilage is pushed in lateral direction.



Fig. 15a,b. The graft sutured in place, using mattress suture technique. A final dorsal refinement remains possible.



Fig. 16. The supra tip dead space is closed with an interdomal apposition mattress suture.

Fig. 17a,b. The midcolumnar incision is closed.



of papertape is administered to the nose
folio wed by the application of a cast.
Perioperative antibiotic prophylaxis is

given, as well as an antibiotic containing
nasal ointment. No further packing is
used.