Preface

In line with Darwin's theory of evolution from 1859, three ingredients have determined the evolution in rhinoplasty during the last century: variation, reproduction and pressure.

On the shoulders of giants, a variety of philosophies and rhinoplasty techniques were consistently developed and modified. These techniques were reproduced by text books and journals as well as during conferences, working visits, and fellowship programs. Pressure, the result of both the drive of the surgeon and the high demands of patients seeking rhinoplasty, has subsequently increased the level of rhinoplastic surgery in our specialty dramatically, and over a broad range of colleagues. In our common efforts to achieve consistently good and reliable results, this book – for what it is worth –, is my contribution to this rhinoplasty evolution.

The book follows the Chinese adage according to which 'a picture is worth a thousand words'. The last decennium I developed the habit to take my camera into the operating room, thus creating the basis for the many full-color peroperative open-structure rhinoplasty photographs. The text is divided in small chapters that were written in pearl form and joined up in a string-like manner. Numerous comprehensible schematic drawings help to elucidate the text and most of them were made by a professional illustrator, Karin Spijker.

Another key feature of this rhinoplasty book is the fact that it is written by one surgeon. This avoided overlap and gave me the opportunity to display 'my way' of performing rhinoplasty from the first consultation to the last postoperative visit. Of course 'my way' of rhinoplasty is nothing more than the result of a slowly progressing process stacking techniques that were invented, modified and described by so many great rhinoplasty surgeons in the past.

I have strived to keep the content of this book simple and easy to read. Although the list of methods and techniques described might not be complete, I believe that the vision displayed will allow for 90% of all encountered Caucasian and Mediterranean rhinoplasty cases to be completed in an adequate manner. Reproducing my vision with the help of this book will hopefully enable young surgeons to develop a platform from where to accelerate their rhinoplasty skills into the third wave of their personal learning curve: the wave of consistently good results (see 1.6).

The book ends with a chapter on nasal reconstruction techniques for skin cancer defects. The incidence of nasal skin cancer will rise in the next decennium, and also the rhinoplastic surgeon should become familiar with these techniques. In addition, the knowledge gained in this specific area will serve as yet another learning curve accelerator for the regular rhinoplasty cases.

Peter J.F.M. Lohuis, MD PhD

1.3 Rhinoplasty learning curve accelerators

A. The classical learning curve or improvement curve is a graphical representation of the changing rate of learning for a given activity (*e.g.*, rhinoplasty) as a function of time. Typically, the increase in retention of information and skill is sharpest after the initial attempts, and then gradually evens out, meaning that less and less new information or skill is retained after each repetition (Fig. 3).

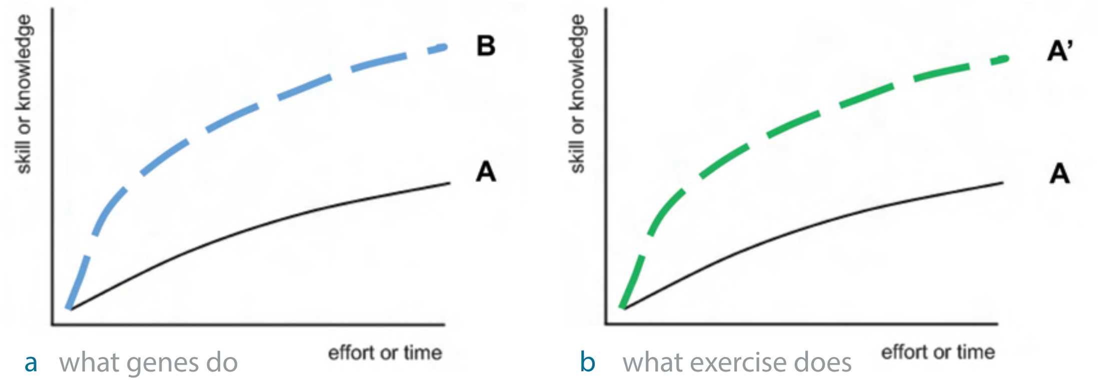


Fig. 3. Some people are gifted with more talent (a) but in time proper exercise also stimulates the development of the individual talent (b).

B. *Genes* determine how learning curve development differs *between* individuals given a similar amount of training and opportunity (A versus B).

C. *Exercise* and *luck* determine how an individual can acquire the most *out of his or her own* particular learning curve (A versus A').

D. Generally, learning curves are displayed as gradual change of learning rate over time. However, one should appreciate that this gradual change is interrupted by time frames of extensive growth which are related to what I tentatively call 'learning curve accelerators'. For a student, knowledge of these 'learning curve accelerators' can have a positive effect on the quality and time-efficiency of the training program, thereby enabling manipulation of the steepness of the individual rhinoplasty learning curve (Fig. 4). Study harder… *and* smarter.

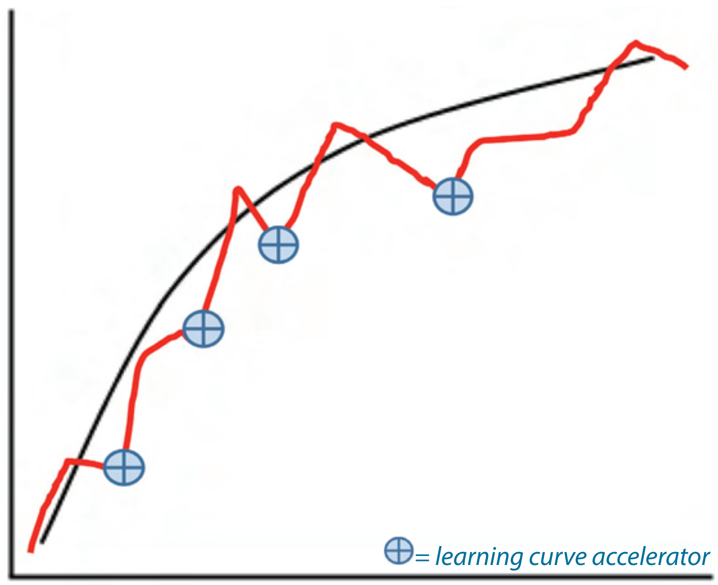


Fig. 4. A learning curve does not show gradual progression in time; instead it shows periods of steep boosts in skills and knowledge: periods of learning curve acceleration. By identifying and implementing 'learning curve accelerators' the quality and time-efficiency of the training program can be manipulated to the benefit of the 'rhinoplasty student'.

1.8 When to perform rhinoplasty without supervision in the rhinoplasty learning curve?

A. The emotional impact of a failed rhinoplasty can be devastating. Rather than gaining a long-awaited nasal enhancement, the patient is left with a disappointing and unfamiliar facial appearance (Fig. 10).

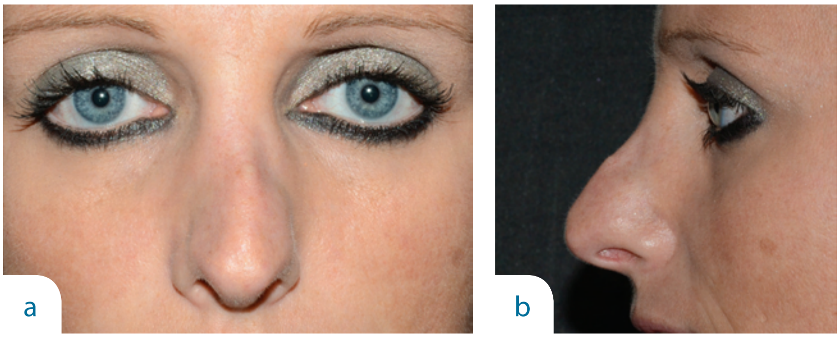


Fig. 10. Inverted-V deformity after over- resection of the dorsum. The surgeon in question considered the procedure carried out appropriately and state-of-the-art. It took the patient eight years to gather enough courage to seek a revision rhinoplasty. Note the heavy make-up to distract attention away from the nose.

B. Assuming that a lifelong rhinoplasty learning curve of a dedicated specialist is indeed a 5-wave progress followed by a sharp deterioration, we can use the shape of this curve to philosophize about an imaginary safety line (Fig. 11) to consider, evaluate, discuss and act on important items such as:

- Should it be allowed to perform aesthetic rhinoplasty without sufficient training?
- What is considered sufficient training – a residency period, a differentiation year, a fellowship?
- Where in the learning curve lies the safety line to perform primary aesthetic rhinoplasty without supervision?
- Should aesthetic rhinoplasty become centralized and restricted to only a few surgeons?

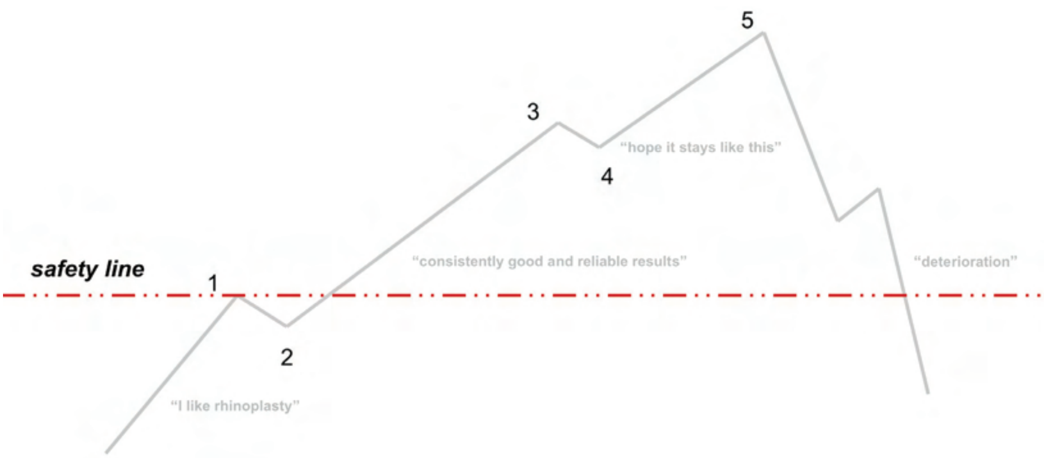


Fig. 11. Imaginary safety line in a 5-wave lifelong learning curve below which most primary aesthetic rhinoplasty cases should be carried out with the help of a supervisor. This safety line is open for discussion and may differ depending on the difficulty of the case. Above all it is the surgeon's own responsibility to act in the best interest of his patient.

2.3 When to consult a psychiatrist and what to expect?

A. It is in the surgeon's best interest to keep in mind some well-known characterizations of potential 'problem' patients. Two of the more useful patient profiles are the SIMON acronym described by Gorney and Martello (1999) and the common 'problem' patients described by MacGregor (1981).

- The SIMON patient is characterized as: single, immature, male, overly expectant, and narcissistic
- MacGregor's list consists of the following five patient attributes:
    - Multiple or serious psychological problems
    - Expects surgery to solve life's difficulties
    - Expects results that are unrealistic
    - Undergoes surgery as a result of external pressure
    - Is dependent on others for self-esteem

B. The goals of referral to a psychiatrist are:

- Objectivation
- Recording (medico-legal)
- Professional advice (surgery yes/no)
- If necessary: medication or psychotherapeutic treatment

C. In your rhinoplasty practice choose to work with one psychiatrist:

- Who has an interest in patients with body-image disorders
- Who ideally you know and have met personally
- Who is willing to make a standardized report that is readable and delivers a conclusion

D. The letter of the psychiatrist should be standardized, well-structured. Minimally it should contain:

- Anamnesis
- Results of psychiatric investigation
- Summary
- Final diagnosis on all five axes of the DSM-IV classification
- Treatment proposal

E. Finally you decide:

- Was the call for help realistic?
    - Yes, no psychiatric problem : surgery
    - Yes, but also a 'normal' psychiatric problem : consider surgery
- Body dysmorphic disorder : no surgery
- Borderline personality disorder : no surgery
- Addiction (cocaine, etc.) : no surgery
- Major live event, *e.g.*, recent divorce : postpone surgery
- Depression : postpone surgery

F. Besides the narcissistic personality disorder, two patient groups need special attention: patients with BDD and patients with BPD. They will be discussed in sections 2.4 and 2.5.

3.10 Ethnic variations: what is typical about Caucasian and Mediterranean nasal anatomy?

A. Approximately 90% of my rhinoplasty practice concerns Caucasian, Mediterranean and Middle-Eastern patients (Fig. 16). Although these three groups certainly have anatomic characteristics that are 'typical', they are frequently not so highly dominant as one finds in Asian or African-American noses. Moreover, all three groups are more and more a mixture of the regional variety in ethnic noses.

B. Basically all three groups exhibit therefore a *large variety in anatomy*. In contrast to the Asian and African-American nose, however, all three display in general overgrowth of the septum. Significant deviation of the caudal septum and asymmetry of the osseocartilaginous vault are the rule rather than the exception. Typically, in most cases patients display a prominent nose and seek a smaller, more refined nose while maintaining function.

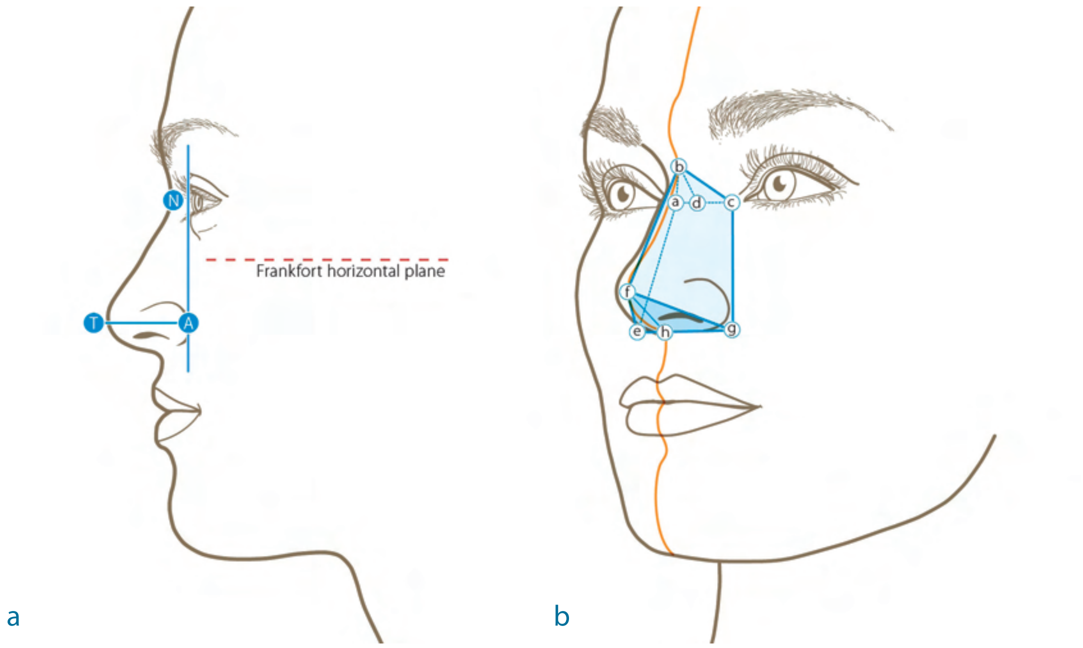


Fig. 16. Example of the more or less ideal profile in a Caucasian woman.

C. Below you will find some typical features *'away from the average'* that are commonly encountered in *primary* cases in the Caucasian and Mediterranean patient. These features may be the result of pathological influences such as injury or infection, but are most commonly the result of the extensive amount of anatomical variations of the human nose determined by ethnic factors, gender and age.

Retrusive forehead: A forehead that slopes posteriorly from the brow to the hairline tends to exaggerate the appearance of nasal length and projection (see 3.6).

4.9 Determination of the smallest cross-sectional surface area in the nasal cavity

A. Software was developed by our group (De Bakker *et al.*, Laryngoscope 2006) that allows determination of the cross-sectional area on any oblique plane intersecting with the nasal passage on CT (Fig. 15).

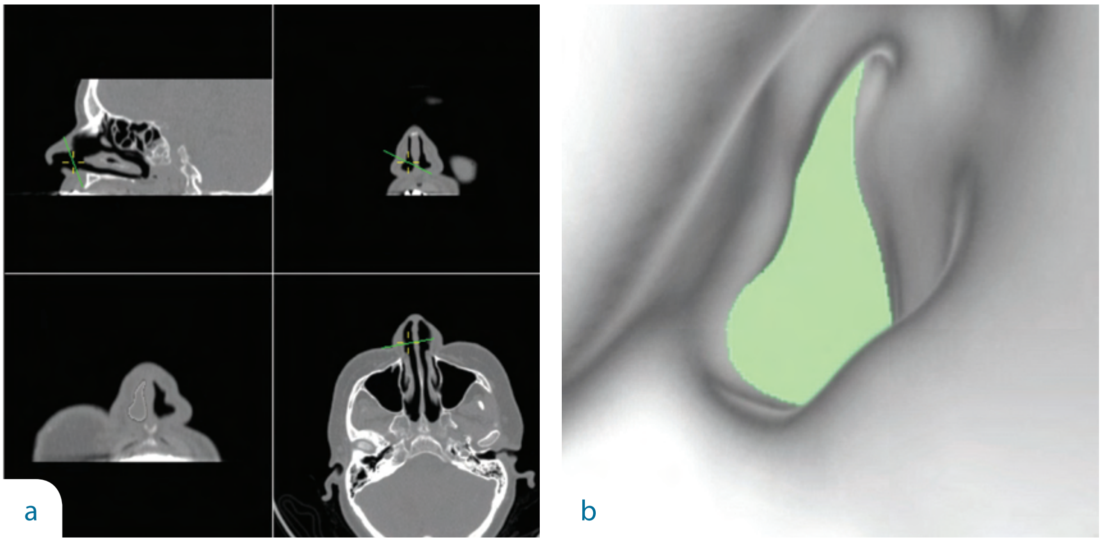


Fig. 15. Example of how the computer software determines and presents an oblique plane on CT. The yellow cross-hair indicates the selected location corresponding in all three views. The green line indicates the intersection of the oblique slice plane with the orthogonal views. Top-left shows the sagittal slice plane, top-right the coronal plane and bottom-right the axial plane. Bottom-left shows the oblique slice plane with the determined area of the nasal passage in white.

B. Subsequently a minimization procedure was developed that automatically determines the location of the minimum cross-sectional area of the nasal passage on CT (Fig. 16).

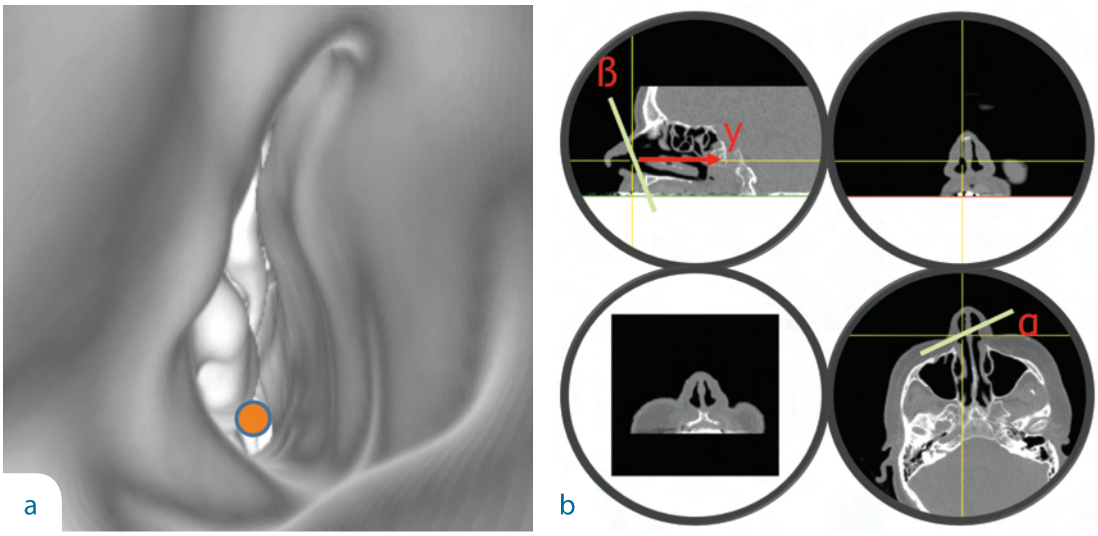


Fig. 16. Random point in the nasal cavity represented by the orange dot. The position of the minimum cross-sectional area plane can be parameterized by a depth coordinate, y (running from anterior to posterior through the nasal passage) whereas the orientation of the plane can be defined by two angles, Alpha and Beta, representing the rotation of the plane around the vertical axis and around the horizontal axis respectively.

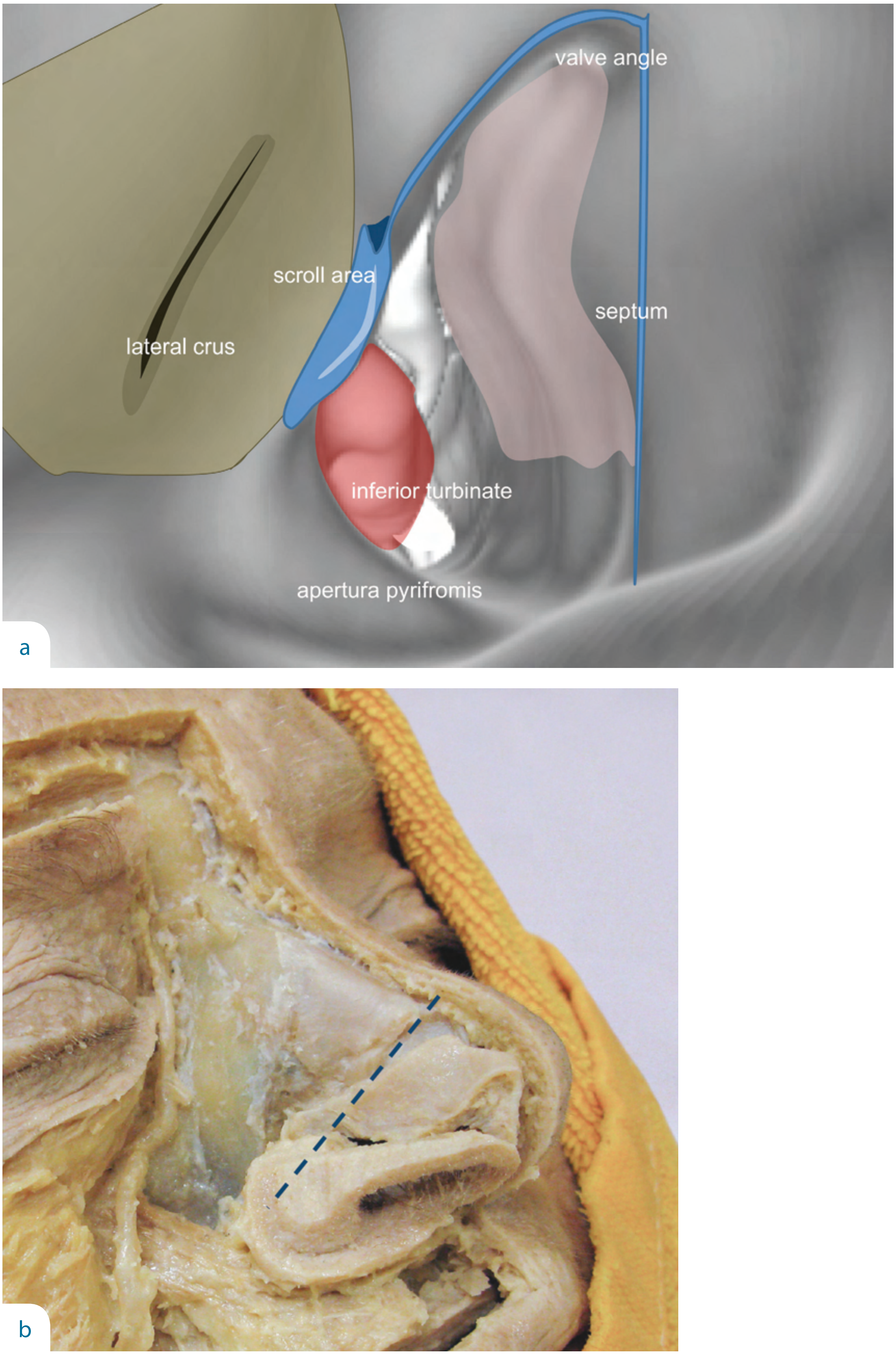


Fig. 19. The plane containing the minimum cross-section is in the plane of the internal nasal valve and therefore the internal nasal valve is the narrowest area of the nasal airway (see 4.9).

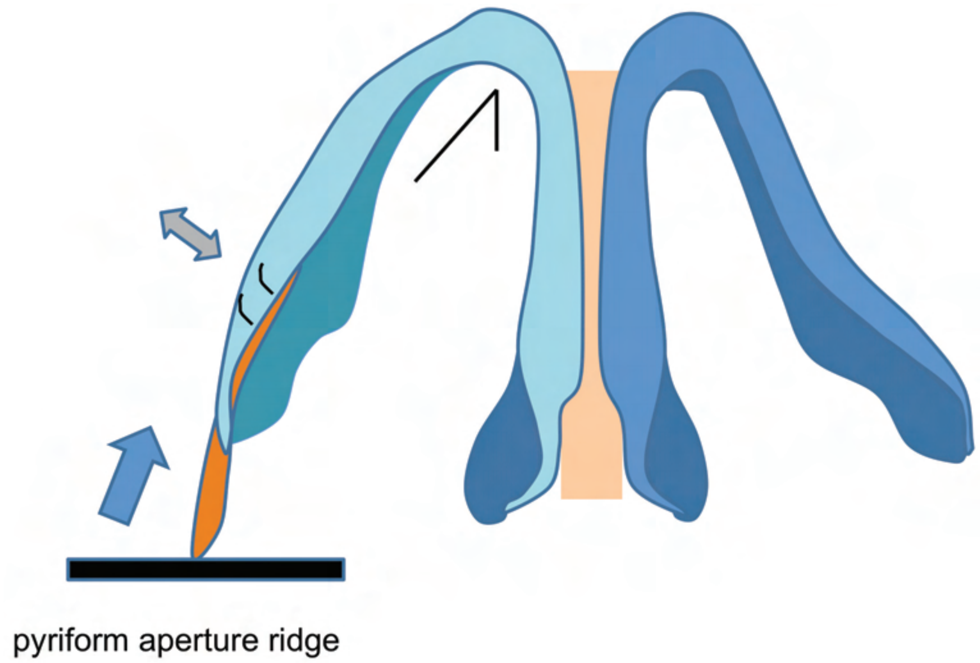


Fig. 28. Schematic figure demonstrating the principle of the LCUS-graft. The amount of increased sidewall tension and rigidity as well as the increase in nasal-valve angle and cross-sectional area are determined by the length of the graft, which can be varied according to need.

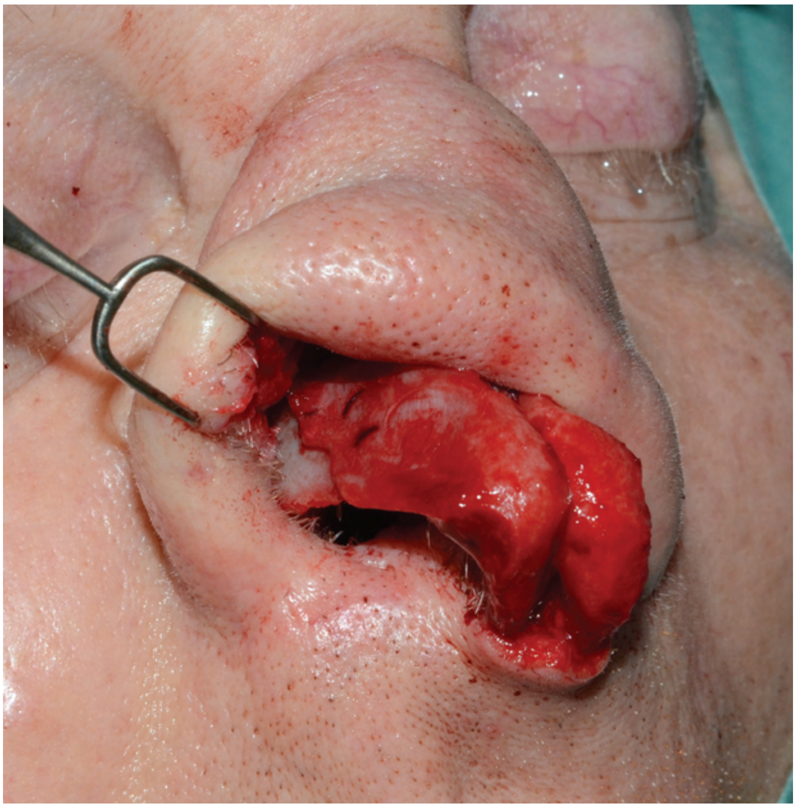


Fig. 29. LCUS graft in place. With the lateral portion of the graft fixed in a small pocket one can lever the lateral crus anteriorly to encourage it to 'spring' in an anterolateral direction.

9. Z-plasty and removal caudal border ULC

Indication
Nasal valve insufficiency.

Effect on nasal valve

Cross-sectional area	+
Rigidity (mass)	–
Rigidity (spring)	–
Anterior valve angle	+

Technique
- Intercartilaginous incision at the area of the caudal part of the upper lateral cartilage
- The caudal border of the upper lateral cartilage is identified and removal of a 3-5 mm piece of cartilage is accomplished
- Extension of the IC-incision to a Z-plasty if applicable
- This involves the creation and transposition of two triangular flaps to further open the nasal valve angle

Considerations
Preoperative analysis helps identifying the area where the internal valve insufficiency arises and helps to choose the most efficient treatment modality. Intranasal Z-plasty appears to be a safe, effective, and relatively noninvasive technique to repair internal nasal valve collapse and should not be forgotten. Particularly in case of an overdeveloped caudal border of the upper lateral cartilage this may prove to be a simple, but effective operation (Fig. 38). A cadaver study by Weeks *et al*. showed that Z-plasty seemed to increase nasal valve surface area more than spreader grafts.

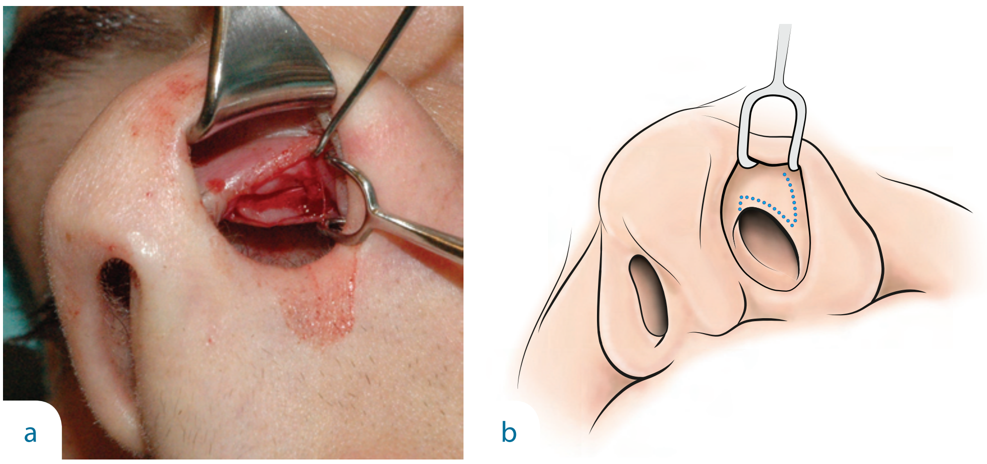


Fig. 38. Overdeveloped caudal border of the upper lateral cartilage easily corrected via IC incision (a). A Z-plasty is drawn to further open the nasal valve angle (b).

and extensive septal tunnelling on both sides, the connection between the medial crura and the caudal septum becomes compromised in a similar fashion as with transfixion.

D. The incisions frequently used in rhinoplasty are listed on the next page, together with their indications.

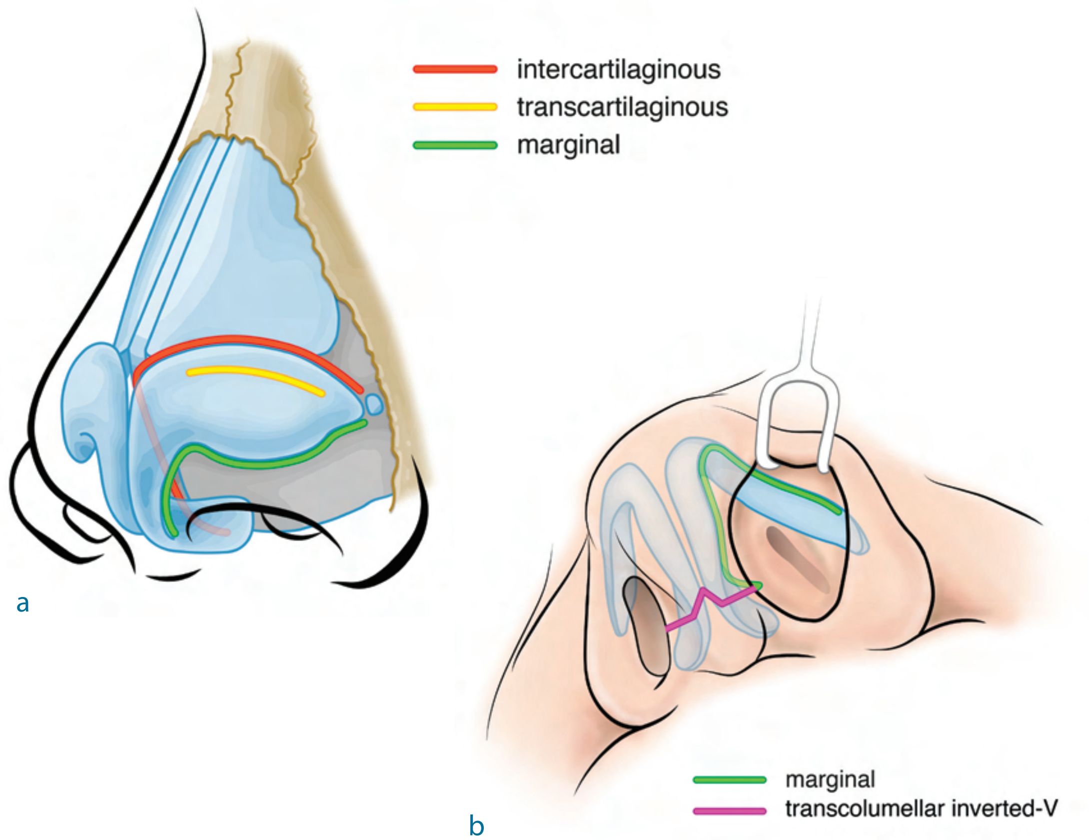


Fig. 2B. Several incisions to gain exposure of dorsum, septum and alar cartilages. Endonasal approach (a) and external approach (b).

INCISION	INDICATION
Caudal septum incision (hemitransfixion)	Septoplasty, endonasal approach
Transfixion incision	Deprojection, endonasal approach
Intercartilaginous incision	Endonasal approach
Vestibular incision	Osteotomies
Infracartilaginous incision	Delivery technique, external approach
Transcolumellar inverted-V incision	External approach
V-incision columellar base	Cleft lip deformity
Transcartilaginous incision	Combines cephalic rim resection and intercartilaginous approach

5.4 Surgical anatomy of the nasal tip

A. The alar cartilages (lower lateral cartilages) form, together with the anterior nasal septum, the cartilaginous framework of the nasal lobule. The shape and size of the alar cartilages can vary extremely.

B. Traditionally, alar cartilage anatomy is conceptualised as a lateral and a medial crus connected by a domal segment. Externally, the conjoint domes constitute the most projecting part of the lobule, the nasal tip. Sheen (1987) suggested dividing the alar cartilage into three components: a medial, lateral, and a middle or intermediate crus (Fig. 4A). In this model, the middle crura diverge and ascend from the anterior nostril margin to join the lateral crura in the domal region while spanning the infratip lobule, which is defined as the soft-tissue region of the nose extending from the anterior nostril margin to the nasal tip. The middle crura can be further divided in a domal and a lobular segment (Fig. 4B). On profile view, the junction of the medial and middle crura may be seen as a double break in which the middle crura ascends slightly (Fig. 4C). This is partly due to the divergence of the middle crurae.

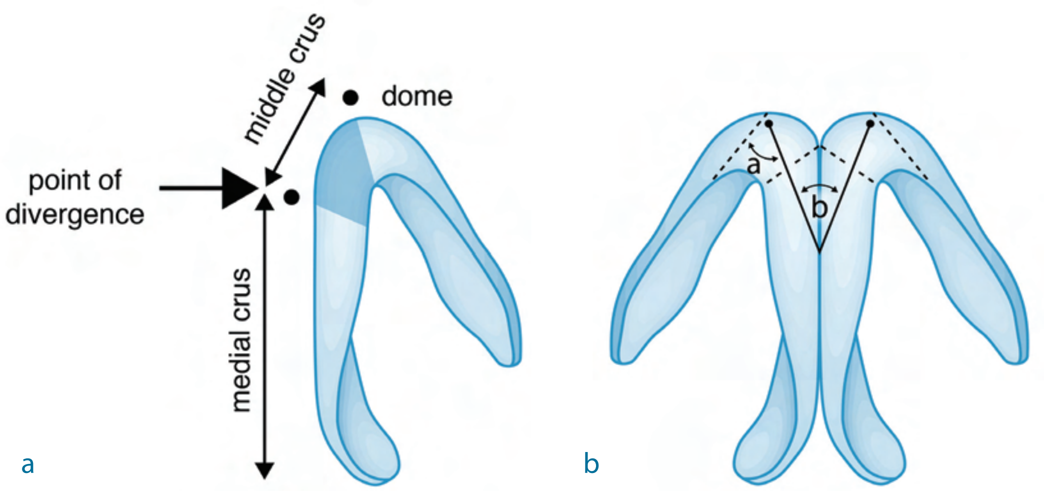


Fig. 4A. a. Relation medial and middle crus. *b.* Angle of domal definition (a) and domal divergence (b).

C. The angle of domal definition and the angle of domal divergence determine the shape and width of the nasal tip. In this perspective, an important part of the anatomy of the aesthetically ideal nasal tip is formed by a concave domal segment (small angle of domal definition) and a convex medial part of the lateral crus, combined with a small angle of domal divergence. Nasal tip surgery aims to preserve, enhance or create these specific configurations.

D. The lateral crus is the widest part of the alar cartilage and is intimately connected to the overlying skin. Fairly near the midline, the lateral crus may slightly overlap the upper lateral cartilage while being attached to the caudal free border of the upper lateral cartilage and the septum by connective tissue (the scroll area). Laterally, the lateral crus is connected to the piriform aperture by dense fibro-fatty tissue, occasionally containing a chain of small accessory cartilages (the hinge area). Superiorly, the alar cartilage is connected to the upper lateral cartilage, in this way supporting the position of the nasal tip. Inferiorly, the caudal edge of the lateral crus provides support for the medial part of the nasal rim before it curves upward, away from the free alar margin. Caudolateral of the nasal tip, there is a small triangular area where cartilage is lacking: the soft triangle of Converse.

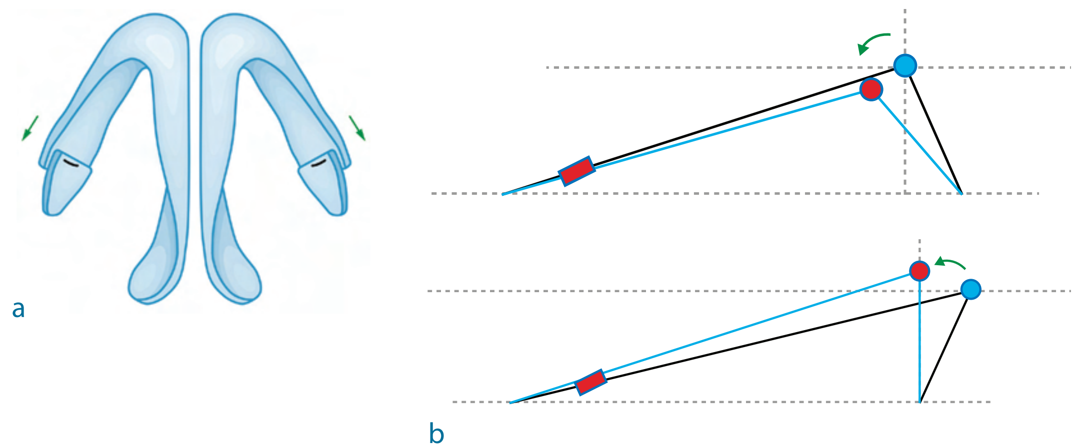


Fig. 5B. According to the tripod model, lateral crural overlay will lead to decreased projection and upward rotation (a). However, when the tip defining point is in a downwardly rotated position, lateral crural overlay will lead to upward rotation and increased projection (b).

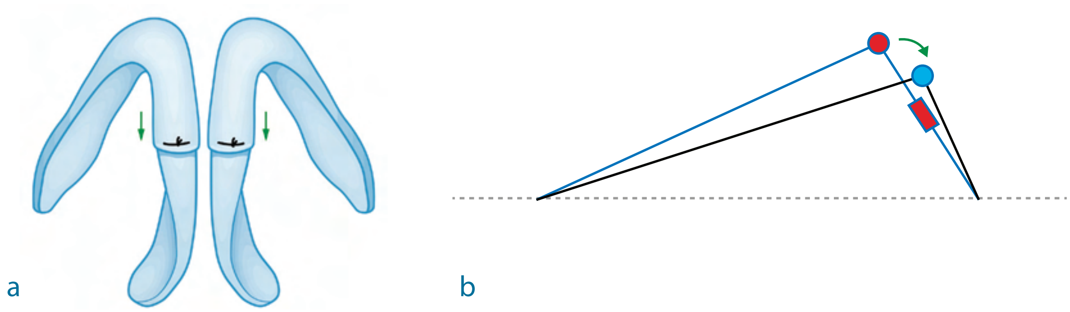


Fig. 5C. According to the tripod model, medial crural overlay will lead to decreased projection an downward rotation (a). This is demonstrated in an open rhinoplasty procedure: a Lipsett procedure of the left medial crura deprojected and derotated the left tip defining point (blue dot) (b).

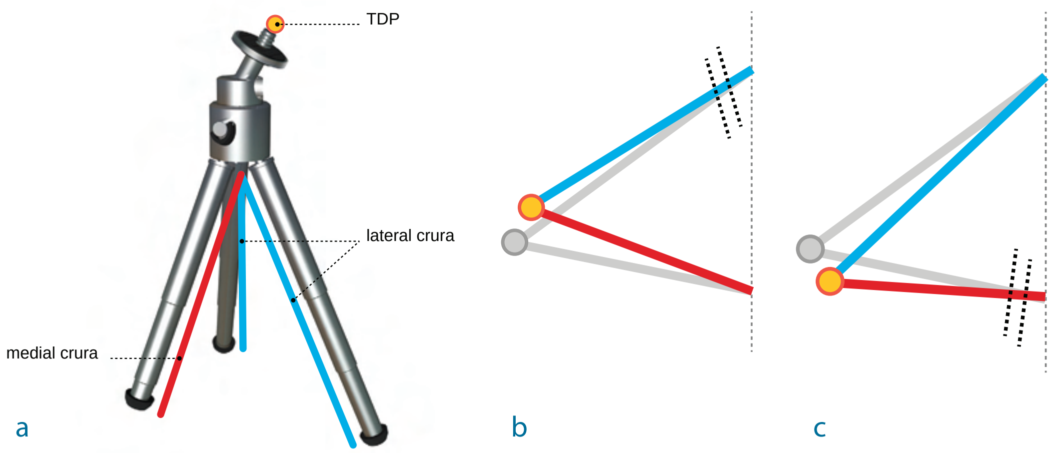


Fig. 5D. By using the tripod stand of a camera it becomes easier to understand the modifications in projection and rotation in the nasal tip tripod concept.

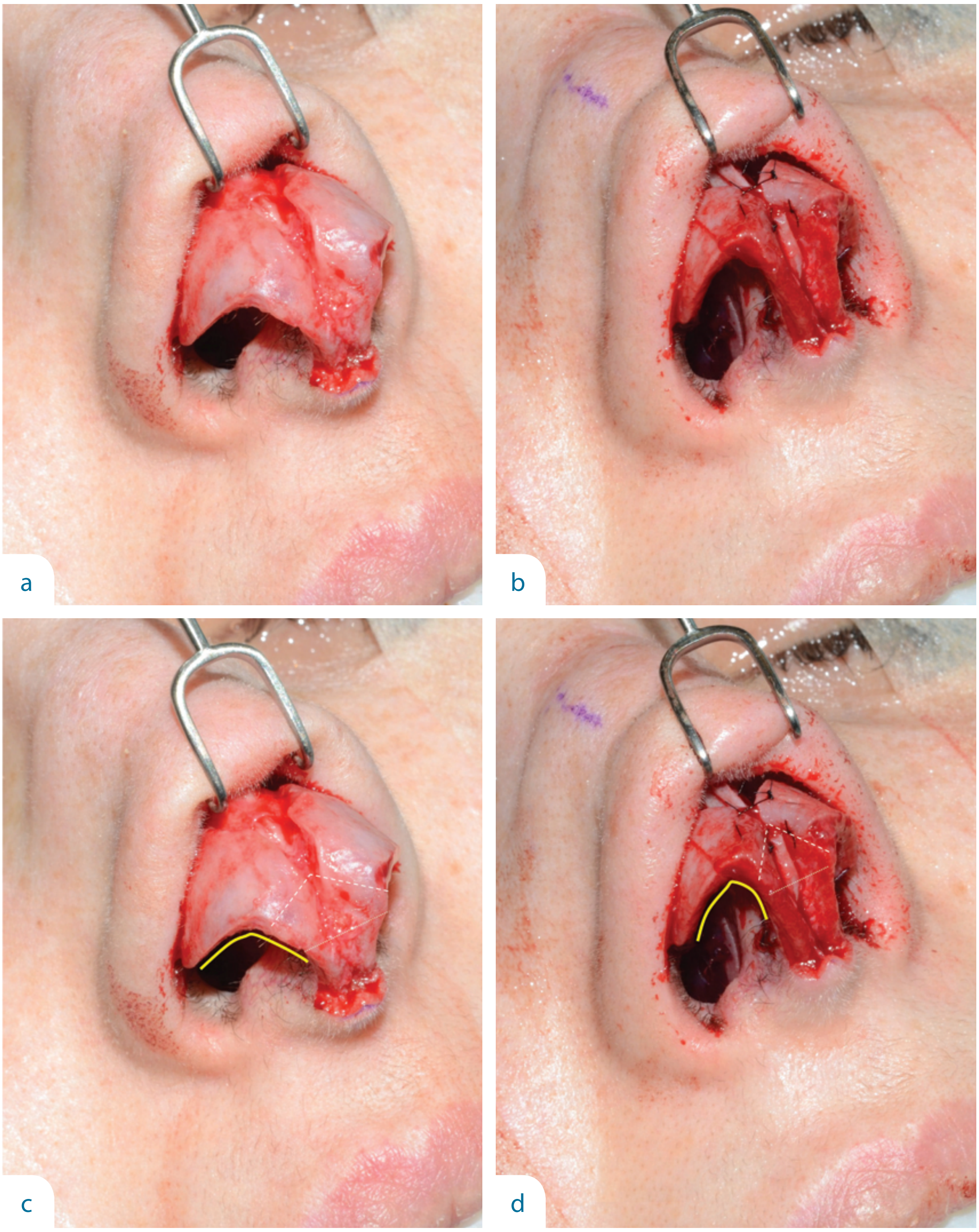


Fig. 7D. Note how in this open rhinoplasty the angle of domal definition and domal divergence are influenced by a combination of ICS, TDS and TIG) changing the volume, width, definition, projection, rotation and shape of the nasal tip.

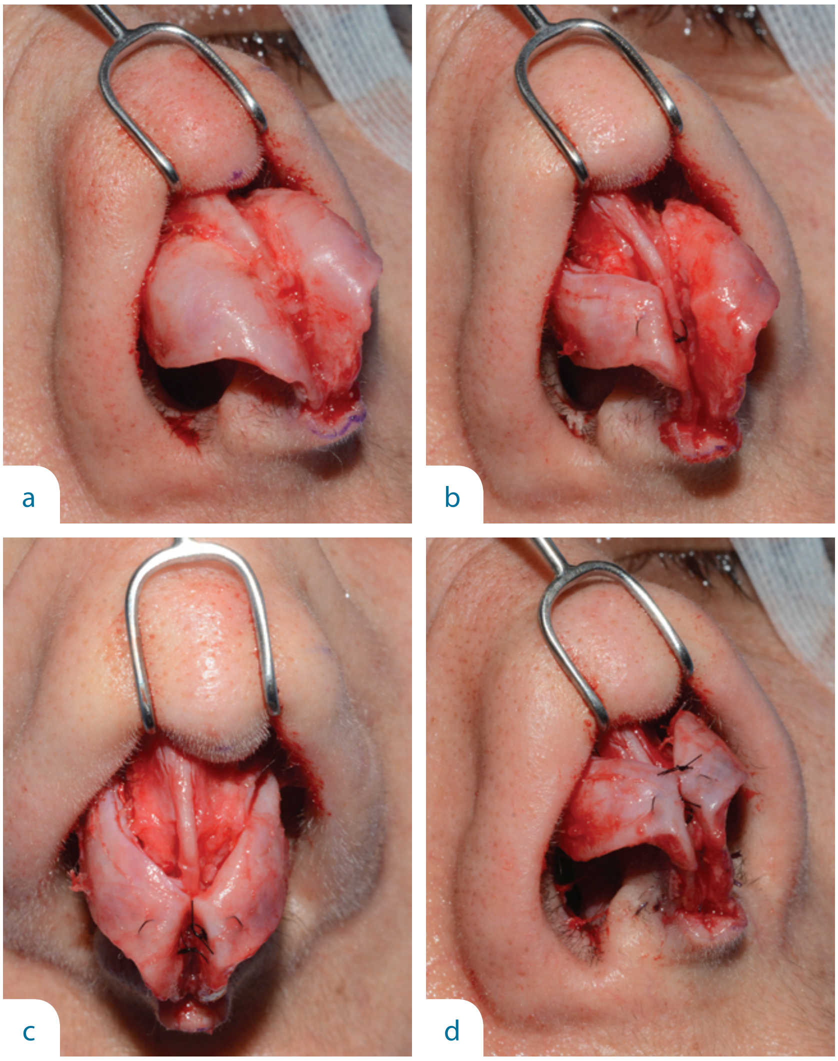


Fig. 12A. Open rhinoplasty demonstrating the cephalic turn-in flap where the cephalic portion of the lateral crus is turned in as a strut graft to reinforce and stretch the alar rim. The cartilage at the cephalic rim can be partially incised (right lateral crus) or folded and fixated without incising (left lateral crus).

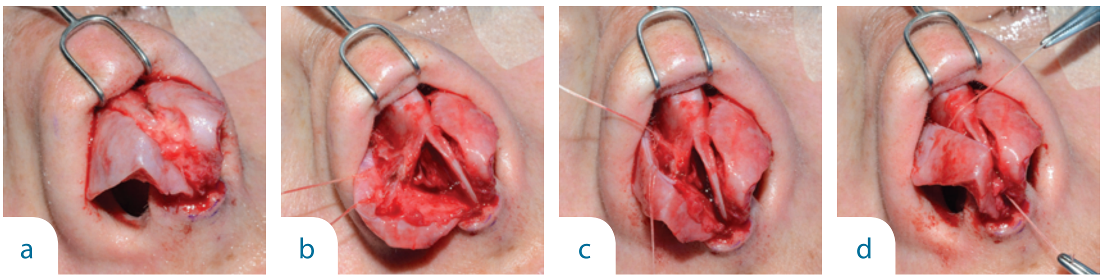


Fig. 12B. Detail of a cephalic turn-in flap in another patient.

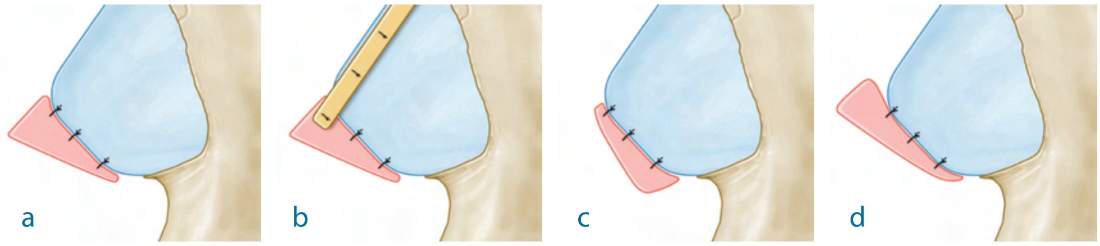


Fig. 19A. Depending on the shape and the orientation of the end-to-end caudal extension graft it can alter nasal length and tip rotation (a, b), nasolabial angle and columellar/alar relationship (c), and projection (d).

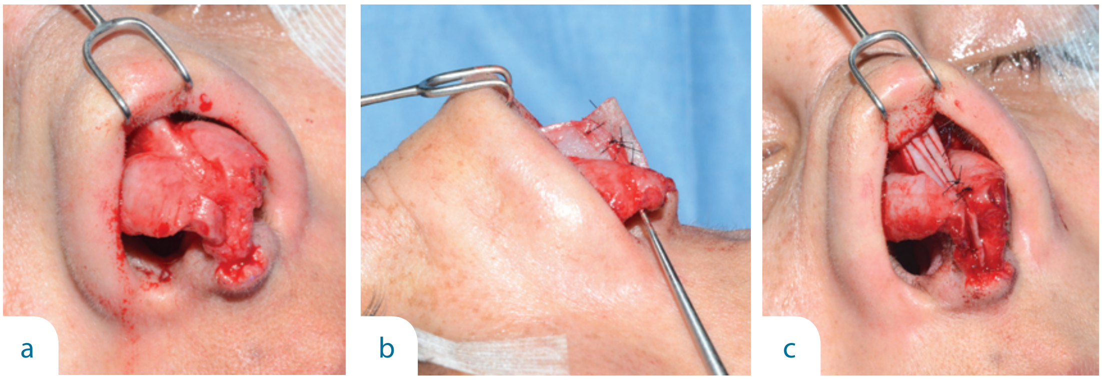


Fig. 19B. Weak medial crura and a slightly overrotated and deprojected tip (a) corrected with a small septal extension graft (b) and tongue in groove suture technique (c). Also volume spreader grafts were used in this patient.

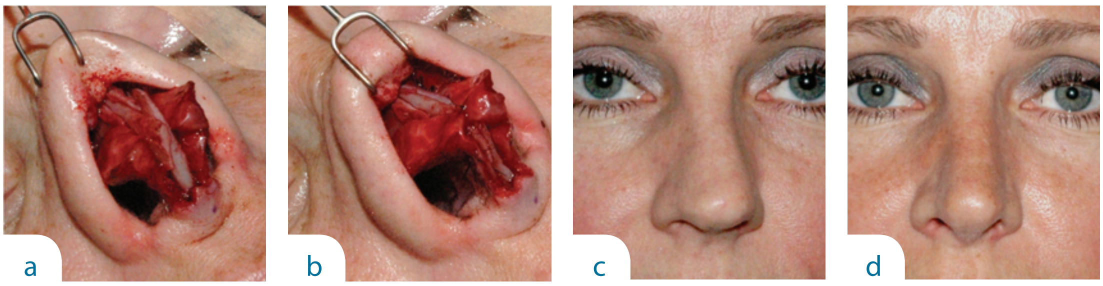


Fig. 19C. Septal extension by connection of a septal extension graft with a right sided extended spreader (a, b) graft to correct volume of the infratip lobule and deviation of the dorsum (c, d).

7.3 Inverted-V deformity

A. Traditional hump-reduction maneuvers are based on *en bloc* resection in a transverse plane, removing the dorsal hump as an osseocartilaginous composite. This method includes excision of the transverse component of the ULCs, which is often associated with a delicate impairment of the stability within the K-area. Destabilization of the K-area triggers an *infero-medial repositioning of the ULCs*, resulting in a conspicuous inverted-V deformity (Figs. 4-6).

B. As the inclining lateral components of the ULCs are of insufficient length for bridging the gap bilaterally to the dorsal septum, this leads on the outside to a conspicuous inverted-V deformity (Fig. 7). This deformity is based on a distinct formation of shadow, which is caused by a difference in height between the caudal margin of the bony dorsum and the lowered infero-medially malpositioned cartilaginous components of the cartilaginous dorsum.

C. Furthermore, the *en bloc* hump removal can easily result in an overresection of the bony vault, generating an open roof. Such an extensive reduction makes infractures of the bony segments an additional prerequisite for compensation, which further weakens the complete K-area. Especially patients with short nasal bones and long, weak ULCs have no means of compensating for the risk of developing a conspicuous inverted-V deformity after traditional humpectomy (Fig. 8).

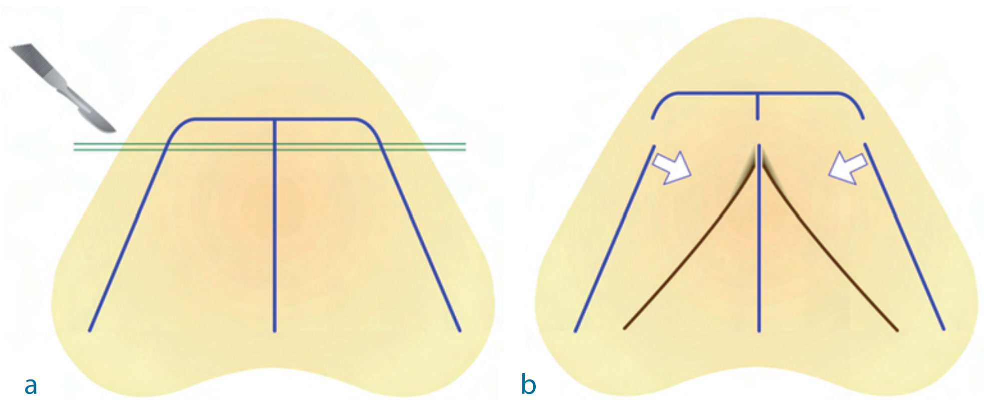


Fig. 4. Schematic illustration of the transverse *en bloc* humpectomy maneuver using a No. 10 blade (the plane of dissection is marked by a double green line). The transverse components of the ULCs are completely removed, leading to an open-roof deformity (a). This results in a loss of structural support on both sides of the septum. Destabilization of the junction between the ULCs and the septum leads to an infero-medial repositioning of the ULCs (vectors of pull are indicated by arrows). The inclining lateral components are of insufficient length for bridging the gap. Consequently, a distinct shade formation unfolds (marked by the shades), which can clinically be identified as an inverted-V deformity (b).

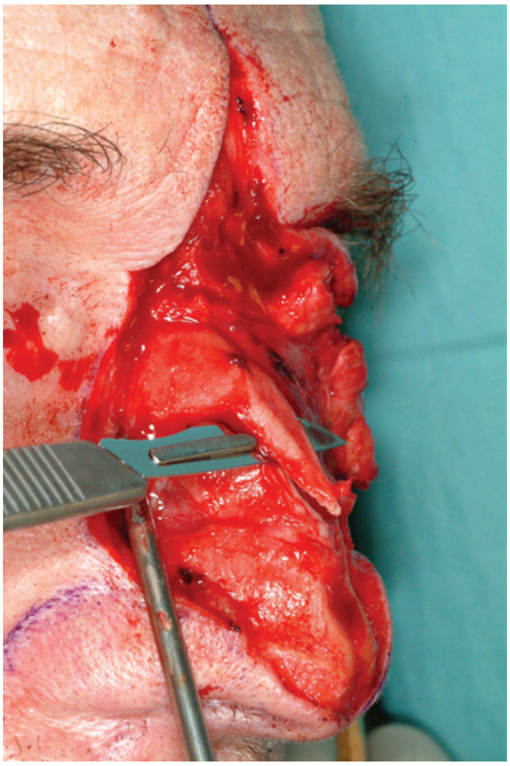
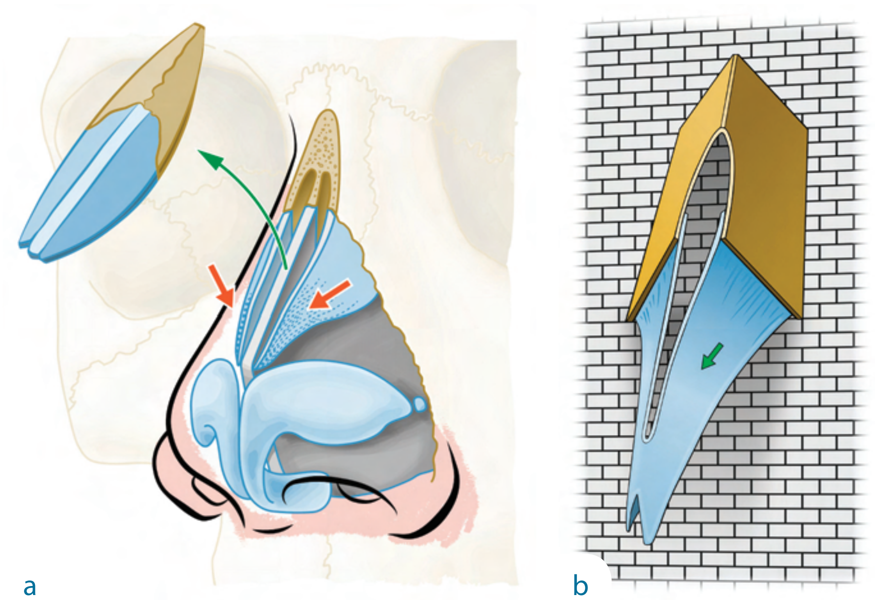


Fig. 5. Intraoperative view of a three-layer resection of the nasal dorsum as an osseocartilaginous composite using a No. 10 blade to lower the dorsum. The resection was performed as an adjuvant procedure in a patient with skin cancer, but this intraoperative view permits clear visualization of a traditionally performed *en bloc* humpectomy maneuver, which is also schematically visualized in Figure 4.



a b

Fig. 6. Destabilization of the junction between the ULCs and the septum leads to an infero-medial repositioning of the ULCs (vectors of pull are indicated by arrows) (adapted from Sheen (1998), with permission).

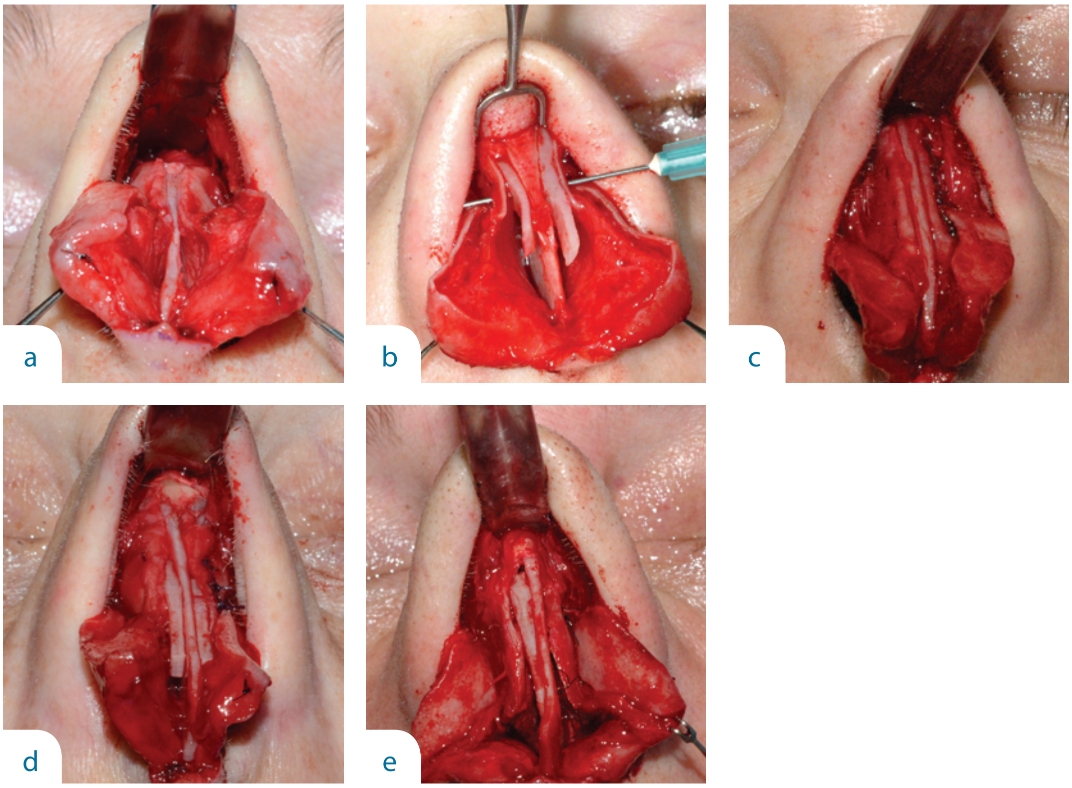


Fig 15. Clinical examples of possible variations of the SHT.
a. Patients with adequate dorsal width only need an incremental reduction in dorsal height. A strip of cartilage is resected from the septum. The unaltered ULCs can then be aligned and sutured to the new anterior border of the septum.
b. Congenital absence of both transverse components of the ULCs. The patient showed a narrow midnasal third. Adequate dorsal width was established using bilaterally placed spreader grafts.
c. Reduction of a high narrow dorsum allows application of the ULCs for increased dorsal width. In accordance with Figure 14, both lateral components of the ULCs were turned in and anchored as autospreaders. This variation enables the augmentation of dorsal width in patients with adequate length and stability of the transverse components of the ULCs.
d. Combination of both additional maneuvers (intraoperative view of case 1): to ensure a continuous dorsal width, we combined cephalically formed autospreaders with caudally placed spreader grafts on both sides of the septum.
e. In the case of an asymmetrical nose, the necessary extension of augmentation can vary on both sides of the septum. Alternative combination of both additional maneuvers: unilateral placement of a spreader graft (right side) and contralateral application of an autospreader.

7.8 Combining dorsum surgery and tip surgery in the overprojected nose: sequence of steps in an example case

Major deformity: overprojected nose, high nasal dorsum, septal deviation to the right.

Minor deformity: hanging columella, slight alar retraction, internal valve insufficiency.

History: A 45-year-old woman seeking aesthetic and functional improvement of her nose.

Fig. 16. Preoperative photos of the patient.

Analysis of preoperative photos: After analysis, the operative goals were to improve nasal patency, re-create symmetry of the dorsal aesthetic lines, decrease projection of the dorsum and tip, and reduce the degree of columella show.

Fig. 17. Postoperative photos of the patient.

Analysis of postoperative photos: More balanced face. Nose looks less conspicuous favoring the appearance of the eyes. Considerably stronger nasal dorsum with symmetrical dorsal aesthetic lines. Tip looks more balanced in all directions.

Utrecht Questionnaire score (see also chapter 10):
Preoperative score: F: 3-1-3-4-2; AE: 4-4-4-4-4; VAS-F left: 5; VAS-F right: 4; VAS-AE: 2.
Postoperative score: F: 2-1-1-1-1; AE: 1-1-1-1-1; VAS-F left: 9; VAS-F right: 9; VAS-AE: 8

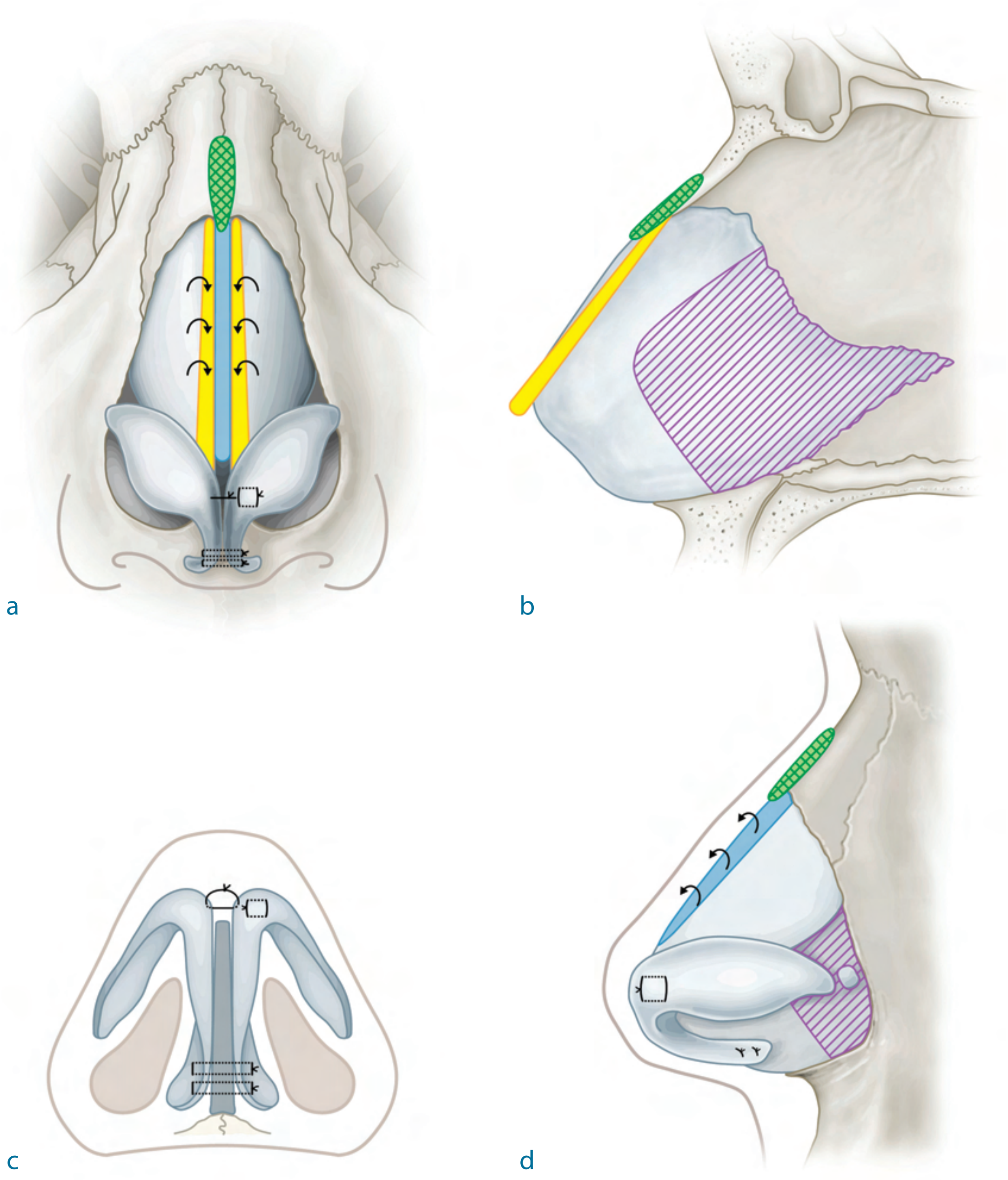


Fig. 18. Surgical steps.

Surgical steps (Fig. 18)

- Inverted-v incision for an open approach
- Releasing connections of medial crurae to septum and nasal spine for tip deprojection
- Septum cartilage harvest and reconstruction
- Initial tip adjustment with sutures to judge the amount of dorsum removal
- Rasping bony dorsum
- Split-hump technique to lower the dorsum
- Autospreader grafts and volume spreader grafts
- Final tip refinement with suture techniques and tongue in groove
- Closure of inverted-v and marginal incisions

Intraoperative photos

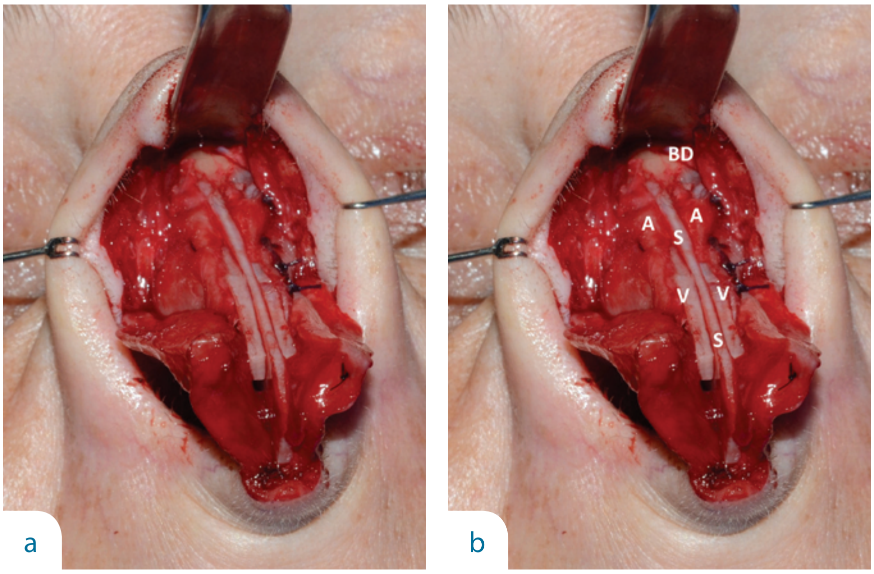


Fig. 19. Intraoperative picture of the reconstructed nasal dorsum. BD: bony dorsum after rasping; A: autospreader grafts; V: volume spreader grafts; S: dorsal septum.

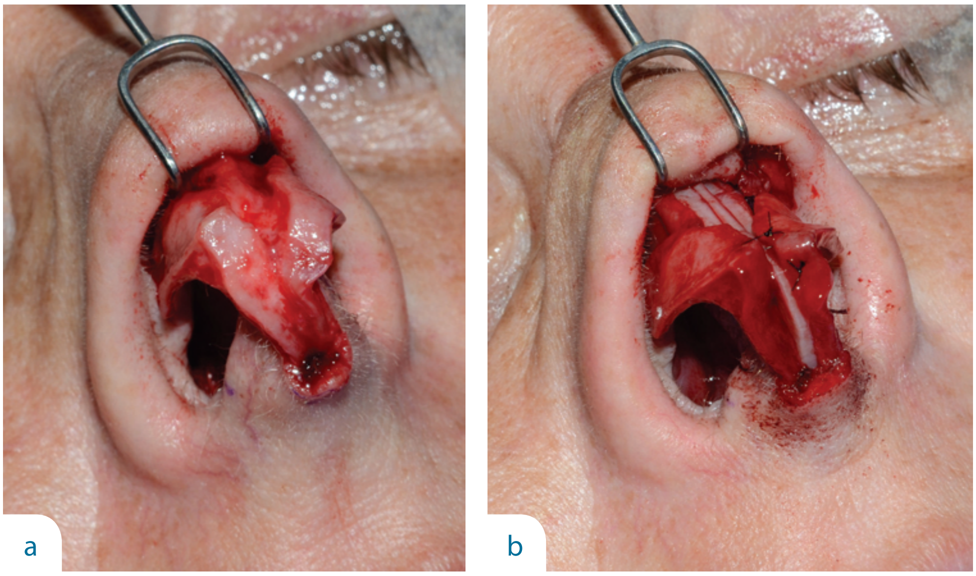


Fig. 20. Intraoperative picture of the nasal tip before (a) and after (b) conservative suturing techniques and spreader grafts.

Comments

Nice rhinoplasty result with a stronger, but natural-looking dorsum improving the balance of the entire face (Fig. 17). Further decrease of the columella show would have lengthened the upper lip too much. Surgical correction of the dorsum involved incremental reduction of the dorsum using the split-hump technique and augmentation of nasal width in the middle third of the nose by sandwiching the septum between cranially formed autospreaders and caudally placed spreader grafts using autologous septal cartilage (Figs. 19 and 20).

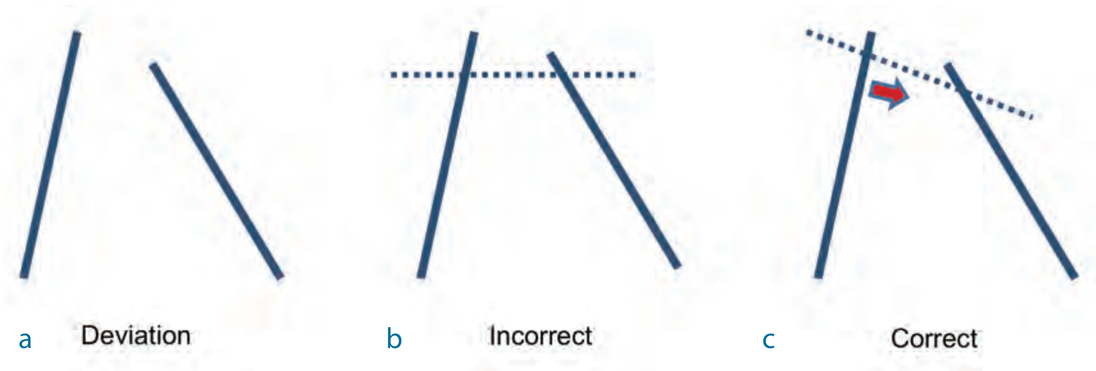


Fig. 30. The nasal bone on the side of the deviation is more vertically oriented.

The middle third

Before the correction of the middle third of the nose, which includes the dorsal septal edge and upper lateral cartilage, the septum should be straightened and the profile reduced if necessary. Unilateral concavity may be corrected by repositioning the upper lateral cartilage using spreader grafts or by camouflaging techniques with onlay grafts (Fig. 31). If the contralateral middle third is too wide, a small strip of the most medial horizontal component of the upper lateral cartilage, adjacent to the septum may be removed. In case facial asymmetry does exclude the nasal midline position, then the width, height and length of the most medial half of the cartilaginous/bony dorsum and tip should be accentuated enhancing at least the illusion of straightness.

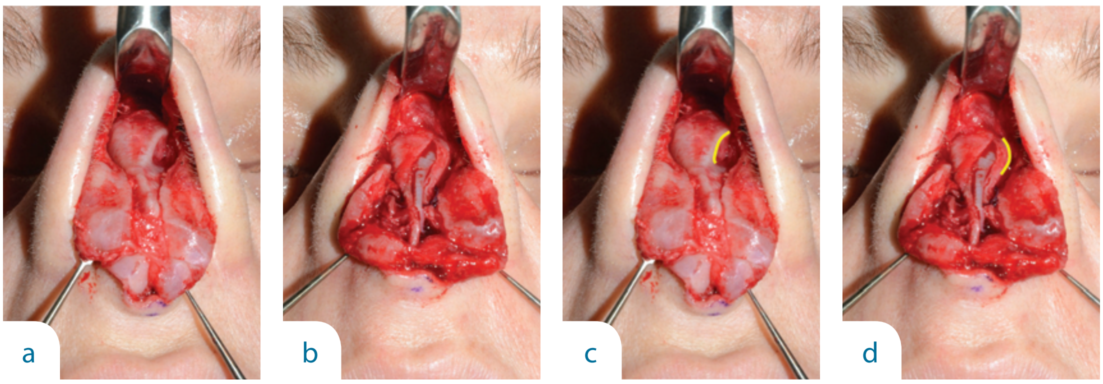


Fig. 31. Left-sided infero-medialization of the left upper lateral cartilage repositioned with a left-sided spreader graft for both functional and aesthetic improvement of an asymmetric deviation.

The lower third

The position of the nasal tip is largely determined by facial symmetry and septal position. Therefore, septal correction must precede any nasal tip work. Subsequently, the alar cartilages are reshaped, reoriented and restructured using a combination of (asymmetric) reduction, suture repositioning and grafting techniques. A strut between the medial crura can adjust support and realignment and allows resection of the most caudal part of the deviated septum without risking columellar retraction. In some case a tongue-in-groove technique is better used to reposition the nasal tip and columella (see 5.10). Symmetry of the medial and lateral crura, as well as the domes and infratip region may be created by augmentation using batten type onlay or shield type cartilage grafts. Asymmetric grafting may be necessary to create symmetry (Fig. 32). Lateral crural underlay grafts (see 4.12 and 5.16) may adjust for extreme medial position of the most lateral aspect of the alar cartilages, diagnosed as a herniation into the nasal vestibulum, as well as asymmetric alar flaring or rim retraction.

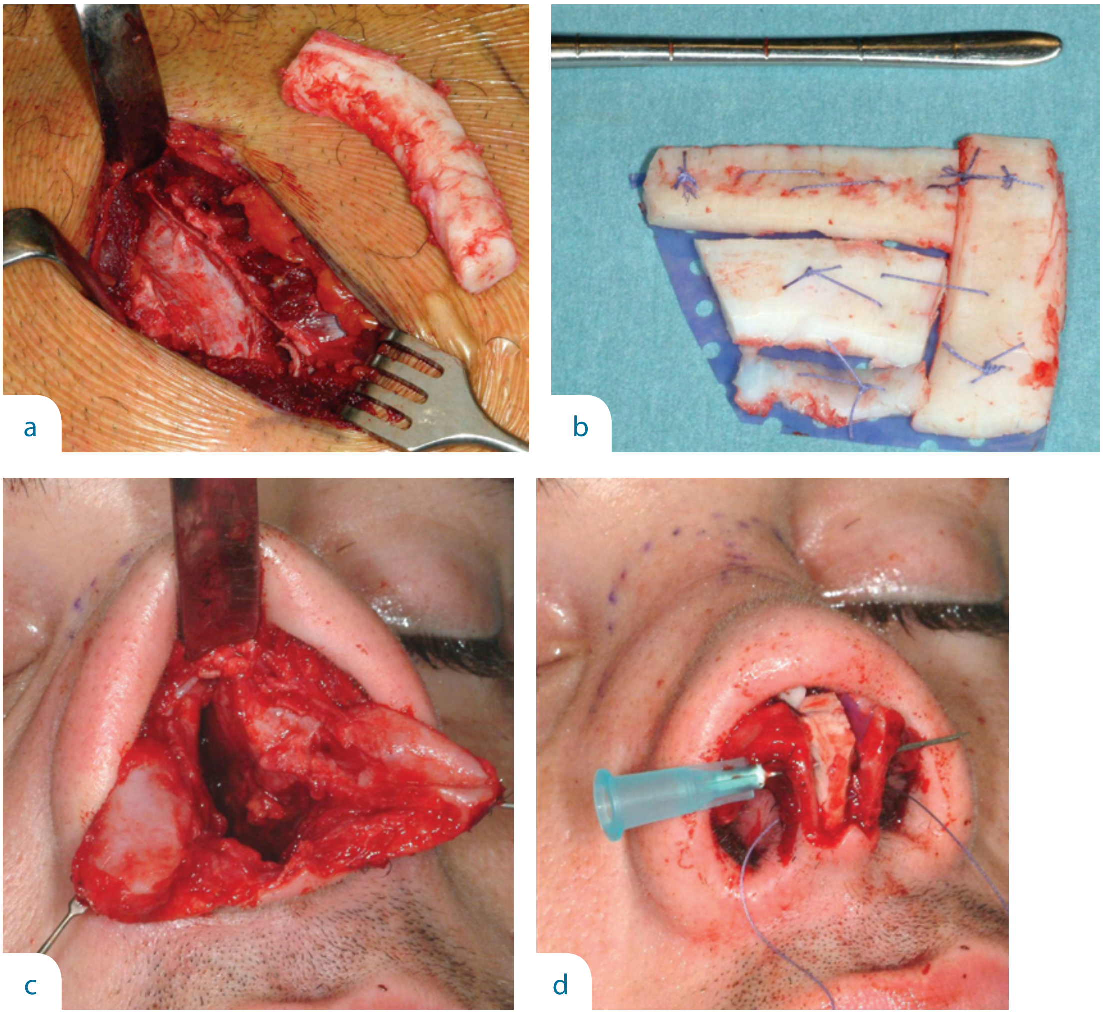


Fig. 11. Septal reconstruction with rib cartilage and PDS foil in a patient with a septal abscess.

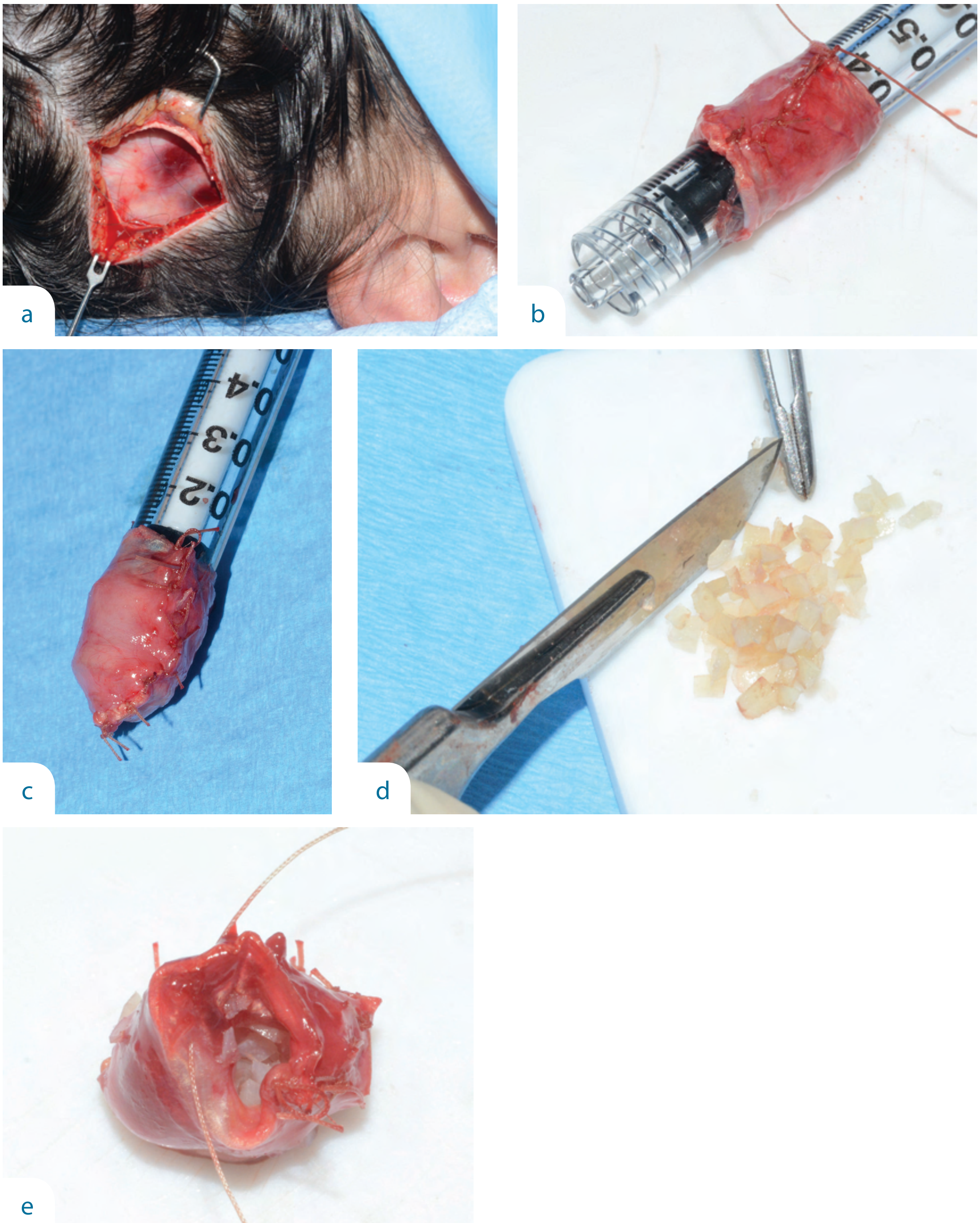


Fig. 17. a-e. Small pieces of 1.0 mm of irradiated homologous cartilage are wrapped and contained in temporalis fascia to prevent the diced cartilage from spilling from its tissue envelope when molded over the nasal dorsum.

10.1 The Utrecht questionnaire for outcome assessment in aesthetic rhinoplasty: introduction

A. The standardization of outcome assessment in aesthetic surgery would be extremely advantageous, because this would allow the comparison of different techniques, quantification of positive effects, and identification of patients unlikely to benefit from surgery. Traditional assessments of surgical success have already examined end points as mortality, morbidity, and physiologic function. These concepts are not applicable to aesthetic surgery. The nature of aesthetic surgery, the creation of beauty, is subjective and eludes clear definition.

B. Despite this obstacle, many assessments of the various dimensions of aesthetic surgery outcome have been prepared previously. In 2003, Ching *et al*. conducted a comprehensive review of aesthetic surgery outcome instruments. They identified body-image and quality-of-life measures to be of the greatest value in determining aesthetic surgery outcomes. Reviewing the instruments that were available at that moment, Ching and colleagues selected several questionnaires as potential candidates for further study. Unfortunately, they did not elaborate on body-image assessment instruments that focused specifically on aesthetic rhinoplasty. Only the Facial Appearance Sorting Test (FAST) was mentioned as potentially useful, as it was found to display good validity and reliability for rhinoplasty, whereas the scale also seemed sensitive to change. However, the study in which the FAST scale was used dates back to 1988.

C. In an effort to improve outcome assessment measurement in aesthetic rhinoplasty, a more recent study started to use the Glasgow Benefit Inventory (GBI). The GBI is a validated post-intervention questionnaire, containing 18 questions based on a 5-point Likert scale, specifically designed for head-and-neck surgical procedures. In a study from 2010, Chauhan and Adamson used the GBI to measure outcome in 30 adolescent aesthetic rhinoplasty candidates. They demonstrated positive changes in behavior and interpersonal relations after surgery. Although tested and validated, the GBI contains 18 questions, which even makes this comparatively short test considerably time-consuming during anamnesis and subject to lengthy analysis afterwards.

D. Our objective for this study was to design a test that was so simple, that a patient could complete the questionnaire within a time frame of two minutes. This would enable the surgeon to instantly profit from the gathered information during anamnesis, both before and after rhinoplasty. Subsequently, we designed a short questionnaire based on a previously validated questionnaire in an earlier study by Alsarraf *et al*. The questionnaire contained a visual analogue scale and five simple questions to evaluate subjective body-image and quality of life in relation to nasal appearance in our patient population (Fig. 1). We describe the results after statistical analysis of our data and define how we think a surgeon could benefit from the questionnaire in the rhinoplasty decision-making process.

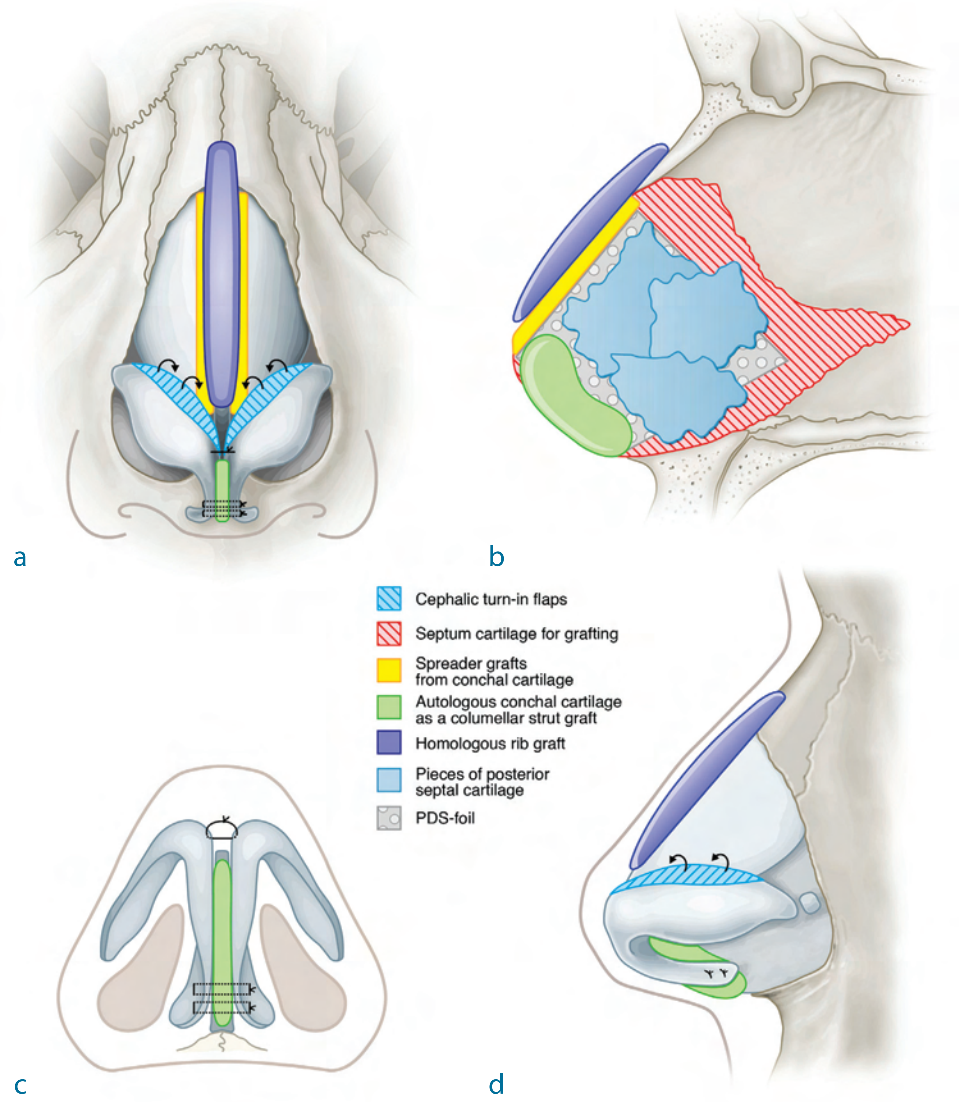


Fig. 3. Surgical steps.

Surgical steps

- External approach
- Transalar septal tunneling
- Harvesting of conchal cartilage
- Harvesting the remaining pieces of posterior septal cartilage
- Septal reconstruction using PDS-foil as a template
- Spreader grafts from conchal cartilage are sutured to the reconstructed septum to widen and strengthen the nasal dorsum
- Autologous conchal cartilage at the base of the template serves as a columellar strut graft
- Cephalic turn-in flap to strengthen the lateral crus
- Tongue-in-groove technique to stretch the medial crura and correct the columellar retraction
- Interdomal suture
- Homologous rib graft as an dorsal onlay to create volume

Intraoperative photos

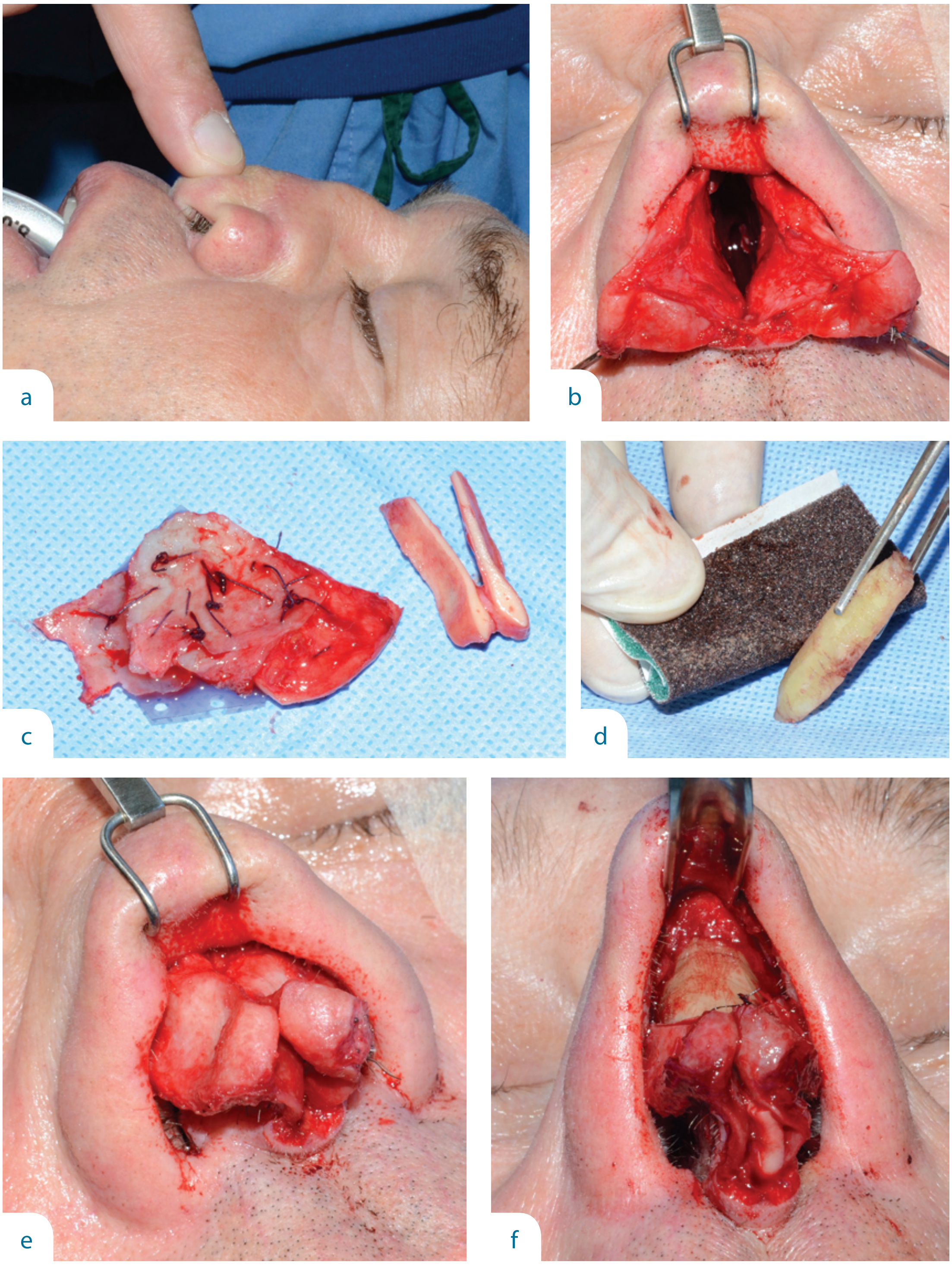


Fig. 4. No remaining anterior nasal septum (a) after transalar tunneling and opening of the cartilaginous dorsum (b). On a PDS template the remaining posterior septal cartilage pieces are reconstructed in combination with a columellar strut graft and two spreader grafts from autologous conchal cartilage (c). Homologous rib graft as an onlay on the dorsum (d). The weak alar cartilages (e) are strengthened by cephalic turn-in flaps and the conchal cartilage columellar strut graft (f). Note how the interior nasal valve angle has opened (f).

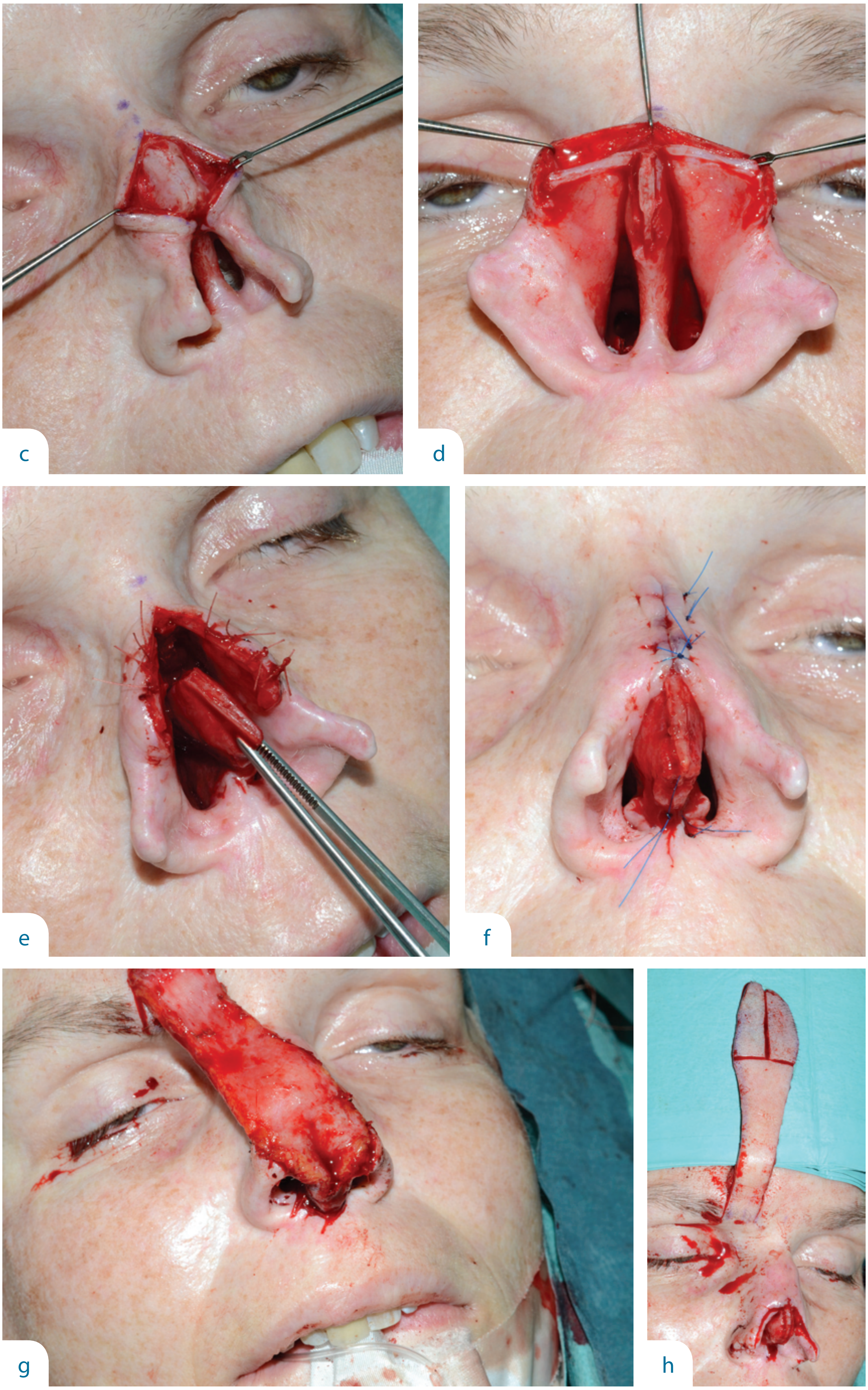


Fig. 40. c-h. Subtotal nasal reconstruction, case 1 - continued.

Fig. 40. i-n. Subtotal nasal reconstruction, case 1 - continued.