

Management of the Crooked Nose

183

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repeated notion about its difficulty

The treatment of a crooked nose remains one of the most challenging problems in rhinoplasty surgery. Inadequate treatment can cause a persistent cosmetic deformity as well as problems with nasal obstruction. There are many techniques currently available for correction of the crooked nasal deformity. Regardless of the method used, revision rates remain significantly high. Patients differ in their goals for surgery, and it is essential that the surgeon understand their needs. While some patients are focused on the aesthetic outcome, others are more concerned with functional improvement. More commonly, patients have a combination of cosmetic and functional concerns. interesting point regarding combination of cosmetic and functional interests

causes for something

ETIOLOGY and functional interests

The crooked nose can be due to congenital, traumatic, or iatrogenic etiologies. A congenitally crooked nose is often associated with overall facial asymmetry. Sometimes the asymmetry is associated with a known syndrome. However, most patients have mild asymmetry that is nonsyndromic. The patient should be informed about these facial asymmetries preoperatively and made aware of how this may or may not affect their outcome. Treatment of the congenitally crooked nose can be difficult since the surrounding deviation of the internal and external facial framework makes it difficult to find a common midline. congenital is more diff.

issues caused by med. treatment

since birth

low velocity = lesser effect due to impact

Traumatic crooked noses can be the result of a low velocity force that causes a simple unilateral fracturing of the affected nasal wall or a higher velocity force that causes bilateral nasal wall deviations along with deviation of the septum. Severe nasal injuries may also be associated with deformities of the orbits or maxilla. higher impact deviates septum as well

Iatrogenic crooked nasal deformities caused by previous surgery may be the result of poorly executed osteotomies, excessive resection of bone or cartilage, and/or poor wound healing. The nose can sometimes heal in unpredictable ways due to the effects of soft tissue contracture,

cartilage memory, severe bone and cartilage asymmetries, aging, glasses, gravity, and so on. poor wound healing could lead to crooked nose

A severely deviated nose almost always has a major septal deformity. Treating the deviated internal septum is usually necessary to facilitate correction of the deviated external nasal component (1-3). The nasal septum has a syndesmosis between the quadrangular cartilage and bones of the vomer and ethmoid that is unique in the human body. Cartilage growth occurs in the perichondrium of the anterior bony septum without eventual ossification (4). Disruption of this process in utero or during childhood can result in the loss of vertical growth. This disruption also has implications in pediatric nasal surgery, as violation of the posterior septum at this junction and the bony septum can have deleterious impact on the growth center of the septum. fixing septum comes with treatment of deviation

could lead to crooked nose fixing septum comes with treatment of deviation

disruption of cartilage growth can cause loss of vertical growth in nose

HISTORY AND PHYSICAL

again w/ preoperative analysis importance

Making an accurate diagnosis is central to the management of the crooked nose, as there are many potential configurations of crooked noses. The surgeon must begin with a detailed history and physical examination, paying careful attention to all aspects of the nose. The history should include information regarding the patient's medical conditions, previous nasal surgery, nasal trauma, nasal airway, allergies, and drug and tobacco use. The mechanism of injury may be helpful to know, as it will help to separate the traumatic deviations from the congenital ones. If a patient had previous surgery, it is sometimes helpful to obtain previous operative report and radiographic studies.

analysis of patient's history will aid diagnosis

To begin the examination, the surgeon should first establish the midline of the face as defined by a vertical line through the menton, the upper incisors, the philtrum, and the glabella. Figure 183.1 shows how a vertical line drawn through from the glabella, through the philtrum, and through the menton can give the doctor a sense of whether the nose is crooked. It can also help identify asymmetries

① midline of face shows whether nose is crooked

deviation occurs in mid and lower 3rd of nose



Figure 183.1 A vertical line is drawn from the glabella, through the philtrum, and then through the menton. This line can help identify asymmetries and deviations. One can see that the deviation of the nose lies in the middle and lower third of the nose. In this patient, the vertical lines allow the viewer to see asymmetry of the mandible and midface. His left side is stronger and has more volume than his right side.

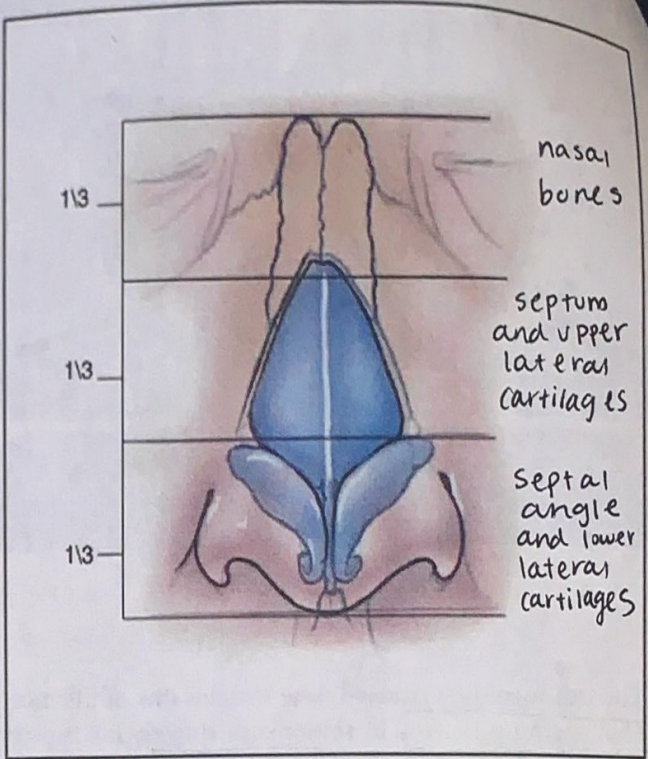


Figure 183.2 The nose can be divided into thirds. This is central to diagnosis and treatment of a crooked nose. The components of the thirds can be seen in this illustration.

A thorough endonasal exam should be completed in a systematic manner to determine the position, health, and function of the nasal septum, turbinates, the internal and external nasal valves, and nasal mucosa. The patient should be observed while taking normal and accentuated breaths through the nasal airway. The examiner will often see external evidence of nasal valve collapse, and

patient is examined while breathing

② divide nose into thirds

of the face that were previously unrecognized. The nose is then divided into thirds, that is, the upper, middle, and lower thirds (see Fig. 183.2). For the most part, we can generally say that the upper third is composed of the nasal bones, the middle third is composed of the septum and upper lateral cartilages, and the lower third is the septal angle and lower lateral cartilages. Each third is individually examined in relation to the midline or relative midline. The thirds are classified into right, left, or center of midline. Given the number of possibilities, there are theoretically 26 permutations of crooked noses. The 27th possibility is a center-center-center nose, which is a straight nose. Half of these permutations are mirror images of each other. Figure 183.3 demonstrates five of these permutations (5).

classification of each third to the R, L, or C

The surgeon should palpate the nose carefully to feel the thickness of the skin and the position of the bones and cartilage and determine tip strength. Convexities, concavities, and buckles in the cartilage can also be determined using palpation. Tip support is determined by manually compressing the tip. Additionally, the surgeon should feel the caudal septum and the septal angle to assess its strength and integrity, as well as the position of the septum in relation to the midline.

* view position of septum with midline

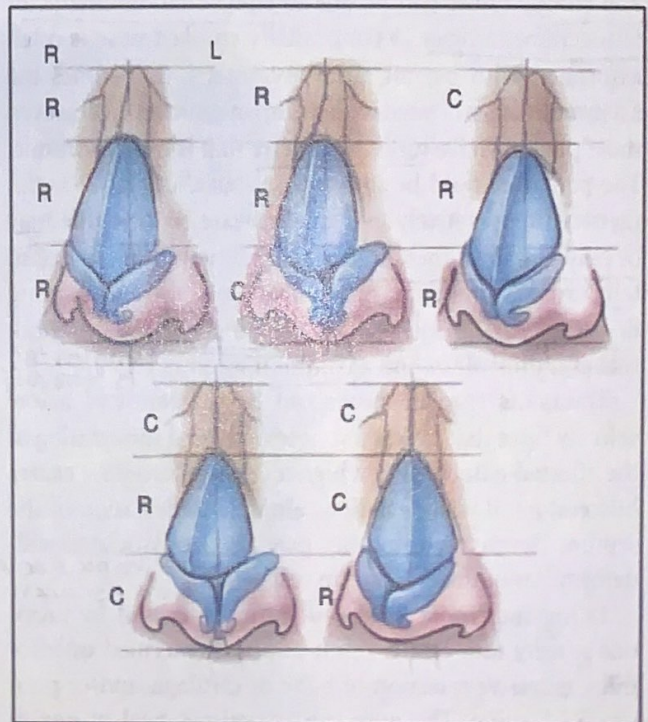


Figure 183.3 Artist-rendered images of five different permutations of crooked noses. There are 26 possible configurations.

surgeon moves nose to determine tip strength, skin strength

If previous trauma present, septum should be moved to determine cartilage presence

depression above ala shows weak internal valve

the area of collapse should be noted. The nasal mucosa should be initially examined without decongestion. This helps assess whether there is an allergic or reactive component. Finally, the nasal mucosa must be decongested with either oxymetazoline or 0.25% Neo-Synephrine. The decongestion may reveal posterior and high dorsal septal deflections that may have been previously hidden by inflamed mucosa. If there is history of previous surgery or trauma, the septum should be palpated with a cotton tip applicator or cerumen loop to determine if the septal cartilage is missing or deficient. In a severely deviated nose, the full extent of the septum may not be able to be visualized without a fiberoptic device. The size of the turbinates must also be analyzed, as many patients can benefit from concomitant turbinioplasty. If the patient has a history that suggests chronic sinusitis, a CT scan may be of benefit.

A careful examination of the integrity of the internal and external nasal valve should be performed. When a patient inspires deeply, a weak internal valve can be seen externally by a depression just above the nasal ala or along the piriform aperture. The external valve is composed of the lateral crura, the suspensory ligaments of the lateral crura, and the fibromuscular tissue of the ala. Manually retracting the cheek laterally (the Cottle maneuver) can help assess if there is an element of valve insufficiency. This can also be done using a curette to stent open the internal and external nasal valves to independently determine where the weakness lies.

Radiographic assessment is necessary if a patient has signs and symptoms consistent with paranasal sinus disease or has polyposis. They may be also helpful in patients who previously sustained major trauma that required open reduction and internal fixation of the craniofacial skeleton. This surgical hardware will need to be identified prior to surgery, as it may need to be removed before osteotomies can be performed.

Standard rhinoplasty photographs must be taken for medical documentation and to assist with the evaluation and analysis of the patient. These views include the frontal, profile, three-quarter, and base views. The authors also like to take two additional photographs when patients have crooked noses. One is the bird's-eye view, which gives the surgeon more information on the shape of the dorsal line (see Fig. 183.4). The use of overhead flash is preferable as it most closely duplicates overhead sunlight, which accentuates deviations. The other is the three-quarter base view where the entire dorsum and nasal walls are visible in relationship to the nasal base (see Fig. 183.5). Photos must be available and easily visible in the operating room during surgery. Due to local anesthetic injections and surgical edema, asymmetries can become masked or imperceptible. Therefore, the surgeon must periodically refer to these photos during the operation. Postoperative photos are usually taken at 6-month and 1-year intervals to track healing progression. → periodic referral to photos during surgery

standard photographs: frontal, profile, 3/4, base
Add: birds-eye, 3/4 base
for crooked noses

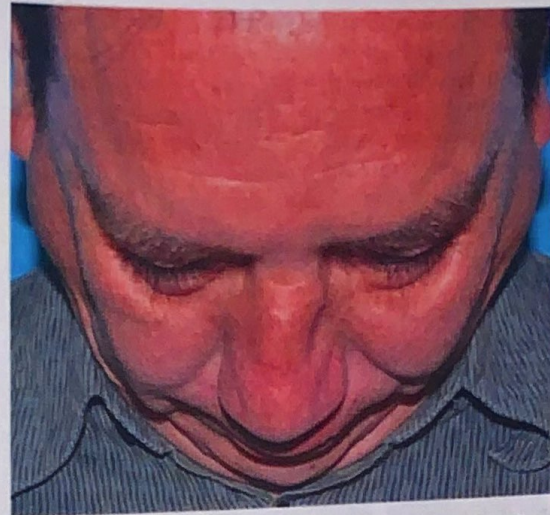


Figure 183.4 This is an example of a bird's-eye view. This allows one to see another perspective of the dorsal line.

surgical correction also done by dividing nose into thirds

TREATMENT STRATEGY

Surgical correction of the deviated nose can be conceptually and strategically divided into the upper third, middle third, and lower third. The upper third is composed of the nasal bones and the frontal process of the maxilla. The middle third is composed of the bony cartilaginous junction (called the keystone), the upper lateral cartilages, and the dorsal septum. The lower third is composed of the caudal septum and the lower lateral cartilages.

Upper 3rd = nasal bones and frontal of maxilla
Mid 3rd = bony cartilage junction (keystone)
Low 3rd = caudal septum & lower lateral cartilages

Septum

Septoplasty surgery in the crooked nose can be approached through a hemitransfixion incision. This incision allows easy access to both sides of the septum and facilitates easy repositioning of the caudal septum to the facial midline. To best mobilize the septum, separation of the posterior and

Hemitransfixion incision = incision made at nasal tip

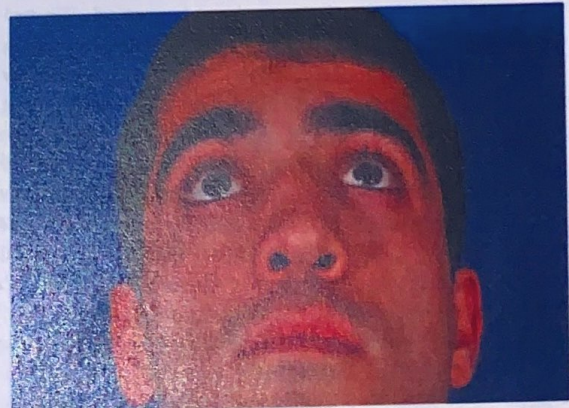


Figure 183.5 This is an example of the three-quarter base view. This view gives a view of the dorsal deviation with relation to the tip.

inferior osseocartilaginous junction plus elevation of the mucoperiosteum of the maxillary crest is often required. Releasing the attachment of the upper lateral cartilages can also help mobilize a septum that is deviated.

A dorsal and caudal "L"-shaped strut must be maintained at least 10 mm in width. The dorsal strut must maintain stable fixation at the superior bony-cartilaginous junction (the key area of the dorsum) to prevent saddling of the middle nasal vault. The caudal septum should also have support from the nasal spine and maxillary crest. Deviated cartilage is either removed or recontoured by scoring the concave side of the deviation with a scalpel. These partial thickness cuts can weaken the septum in a manner that facilitates repositioning toward the midline. Spreader grafts can also help correct deviations of the dorsal septum (see section on correction of middle third). Caudal deviations can be corrected with vertical scoring on the concave side of the septum. Retrograde soft tissue dissection behind the medial crura must be done to create a central pocket in the membranous septum. With severe deviations of the caudal septum, the mucosa is scarred toward the side of the caudal deflection. If a pocket is not made for the newly straightened caudal septum, the contracted mucosa will push the septum back toward the side of the deviation and cause a relapse of the nasal obstruction.

If the septal deviation is severe and the surgeon is unable to correct it through the endonasal or external approach without significantly compromising support to the dorsal or caudal strut, an extracorporeal septoplasty should be performed. In this procedure, the cartilaginous septum is removed, straightened, contoured, and then reimplanted (6). It is important to leave a small portion of the dorsal cartilage in the keystone area (area where the septum articulates with the nasal bones) to provide a point of suture fixation to prevent postoperative collapse of the dorsal septum. The use of a polydioxanone sheet to stabilize the cartilage grafts has been reported to facilitate the extracorporeal technique (7).

If turbinate hypertrophy is present and causing obstruction of nasal airflow, a submucous resection is performed.

Upper Third

Asymmetry of the upper third of the nose is caused by deviation of the upper bony nasal framework. The nasal bones articulate with the frontal bones superiorly and the ascending process of the maxilla laterally. They are thickest at the nasion superiorly and taper to become thinner as they approach the caudal articulations with the upper lateral cartilages. Asymmetry of the upper bony nasal dorsum is often associated with high deviations of the septum. While small deviations can be amenable to rasp reduction or small onlay grafts, osteotomies are typically needed to correct most deviations of the upper third (8). The three primary goals of osteotomies are to straighten a deviated nasal dorsum, narrow the nasal sidewalls, and close or

osteotomy (cutting bone) needed to correct upper 3rd deviation

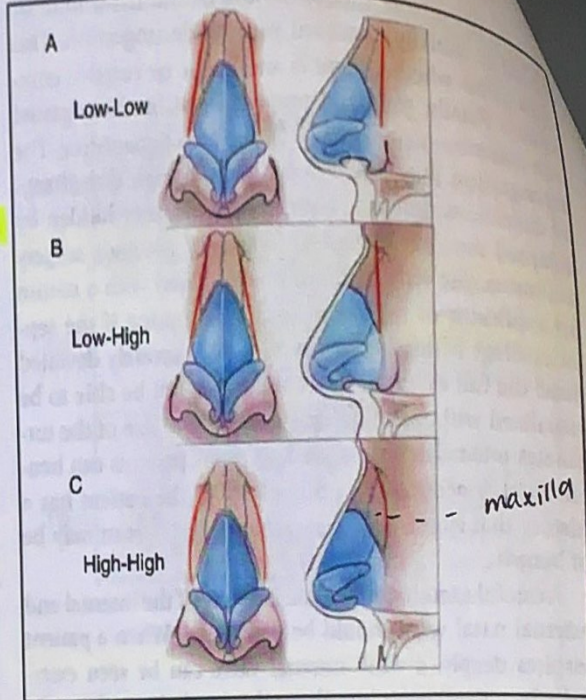


Figure 183.6 This figure shows three different types of osteotomies that can be performed. The upper image is that of a low-low osteotomy, where the osteotomy is closer to the maxilla (low) throughout its route. The middle image is that of an osteotomy that starts low and ends high (closer to the dorsum). The bottom image is that of a high-low-high route, which is the most commonly used type of osteotomy route. The midportion of the osteotomy dips closer to the maxilla (low).

open the nasal vault (9). It is important for the surgeon to know which of these goals are necessary in any given situation. There are many ways to perform osteotomies. See Figure 183.6 for three different patterns of osteotomies. If the roof is open from trauma or dorsal reduction, medial osteotomies may not be necessary (9). Lateral osteotomies are usually performed in a high-low-high fashion. However, a high deviation may require a high-low-low configuration to center the upper third. If the nasal bones are mobilized, but the upper third remains crooked, this may be due to a persistently deviated bony dorsal septum that extends into the superior septum (10). Two approaches can be taken to center the deviated superior septum. The first option is to mobilize the superior aspect of the septum with percutaneous medial osteotomies using a 2-mm chisel, taking care not to extend the fracture into the cribriform plate. The medial osteotomy can also be done as a "cross-root" osteotomy. In this technique, the osteotome is used to cut across the bony septum and the upper nasal dorsum using an endonasal approach. A curved osteotome is placed medially on the convex side of the nose at the site of a typical medial osteotomy. The curved osteotome cuts across the nasal root to the contralateral side to mobilize the central portion of the upper third. With either the percutaneous transverse or the cross-root osteotomy, the entire upper third should be easily mobilized from side to side once the lateral osteotomies have been completed.

dorsal strut must be stable

spreader grafts used for deviation

In extreme severe septal deviation, septum can be removed & reimplanted

osteotome cuts the nasal bone to straighten dorsum

- ① straighten dorsum
- ② narrow nasal side walls
- ③ close or open nasal vault

preservation of structure is important

Preserving the lateral nasal periosteum and the underlying mucosa as much as possible will avoid excessive medial or posterior displacement of the nasal walls after osteotomies are completed. This is accomplished by using small osteotomes and elevating a small tunnel of periosteum along the lateral osteotomy site prior to creation of the osteotomy.

Another option for the crooked upper nasal third is to camouflage the deviation with bony reduction on the convex side and onlay cartilage grafting on the concave side. This reduction and contralateral augmentation of the upper nasal third will help center the upper third without aggressive osteotomies. This technique works well for minor deviations when the bone is relatively thick.

Middle Third

The middle third of the nose is composed primarily of the paired upper lateral cartilages and the dorsal nasal septum. Inferiorly, the upper lateral cartilages articulate with the lower lateral cartilages via the scroll. Superiorly, both the upper lateral cartilages and the septum articulate with the nasal bones. Standard septoplasty techniques emphasize correcting deviations along the inferior aspect of the septum. Deviations along the dorsum may require separating the upper lateral cartilage from the dorsal septum, vertical scoring of the dorsal cartilage, and osteotomy techniques. However, this at times may not correct the deviation sufficiently, and other methods must be used. Two commonly used methods are the spreader graft and the onlay camouflage graft (11). The spreader graft is a cartilage graft that is placed between the upper lateral cartilage and the septum. Figure 183.7 shows bilateral spreader grafts placed to help strengthen a deviated middle third. In order to place the graft, the upper lateral cartilage must be separated from the nasal septum. The mucosa is elevated from the dorsal septum, and the spreader graft is placed between the upper lateral cartilage and septum, and it is sutured into position. Unilateral or bilateral spreader grafts can be used for this purpose. The two spreader grafts may be of unequal thickness to correct for deviations of the nasal dorsum. In Figure 183.7, bilateral spreader grafts were placed. Another option is to use the medial margin of the upper lateral cartilage as an auto-spreader graft if there is redundant cartilage after straightening the dorsum. A vertical cut is made through the redundant upper lateral cartilage 2 to 3 mm from the medial margin (preserving the mucosa) and turned inward as an auto-spreader graft (12,13). Using the redundant upper lateral cartilage saves precious septal grafting material for other parts of the nose. For noses that require dorsal augmentation and widening of the middle nasal vault, an onlay spreader graft can be used (Figs. 183.8 to 183.10). The onlay spreader is a trapezoid-shaped graft that is placed over the dorsal septum and between the upper lateral cartilages (14). The graft is 4 mm wide superiorly, 5 to 6 mm wide inferiorly, and approximately 2 cm in length and running the length of the dorsal septum.

onlay spreader graft used to widen middle nose vault

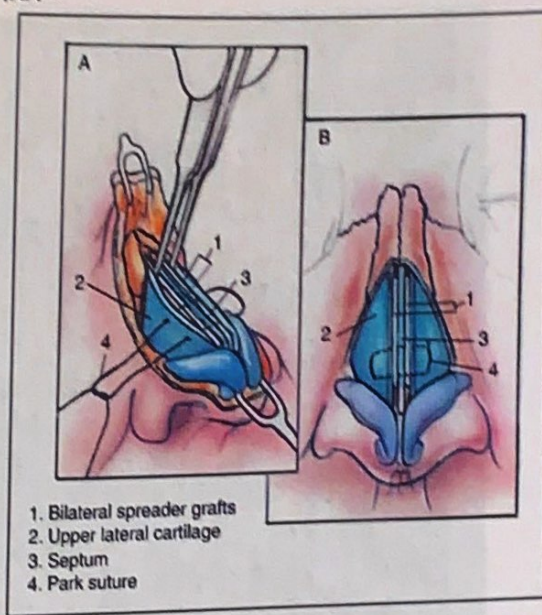


Figure 183.7 This illustration demonstrates how bilateral spreader grafts are placed. Cartilage is placed from the edge of the nasal bone and along side the septum, on each side. At least one mattress suture is placed to maintain the position of the spreader grafts in open external rhinoplasty. In endonasal rhinoplasty, suture fixation may not be necessary if properly sized pockets for the grafts are created.

It is important to avoid excising upper lateral cartilage until absolutely necessary. If the upper lateral cartilages are cut before the deviation is fixed, there may be a lack of upper lateral cartilage on the side of the deviation once the nose is shifted to the midline.

Deviations of the middle third of the nose can also be due to dislocation of the upper lateral cartilages from the caudal margin of the nasal bones. The surgeon can sometimes reapproximate the cartilages back to their anatomic position and suture-fixate them to the periosteum; otherwise, camouflage grafts can be utilized. Deviations can also be caused by depressions due to a collapse of an osteotomized or traumatically fractured lateral nasal wall. These deviations can be corrected with onlay grafts placed over the lateral nasal wall or spreader grafts. The decision to use an onlay graft versus a spreader graft is based on the patient's nasal airway, the size of the depression, and the shape of the upper lateral cartilage. If the size of the depression is small and is not affecting the internal nasal valve, a small onlay graft of crushed or precisely contoured septal cartilage suffices. If the depression is small and the nasal valves narrow, spreader grafts are preferred since they improve the airway as well as correct the depression. If the depression is large and the airway is narrow, a combination of both spreader grafts and onlay grafts over the upper lateral cartilage, dorsum, or the cephalic margin of the lower lateral cartilage may be necessary (Figs. 183.11 and 183.12).

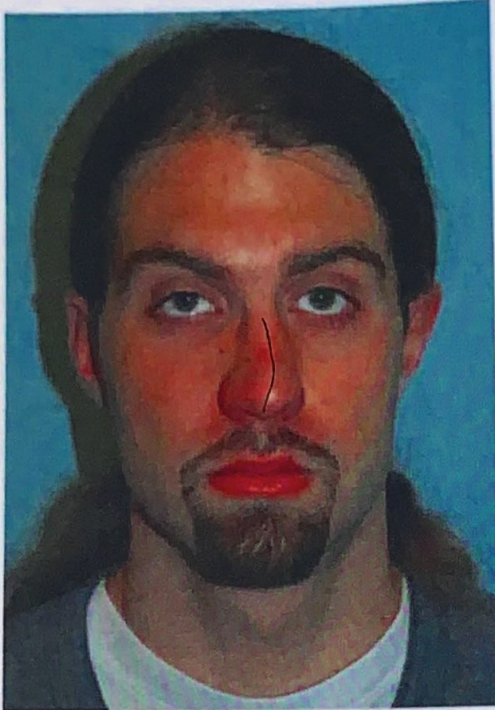
Mid 3rd deviation could include removing upper lateral cartilage

spreader grafts placed between upper lateral cartilage + septum

Bilateral = two, one may be bigger than the other

avoid cutting upper lateral cartilage until necessary

spreader grafts are good to use in order to improve airway



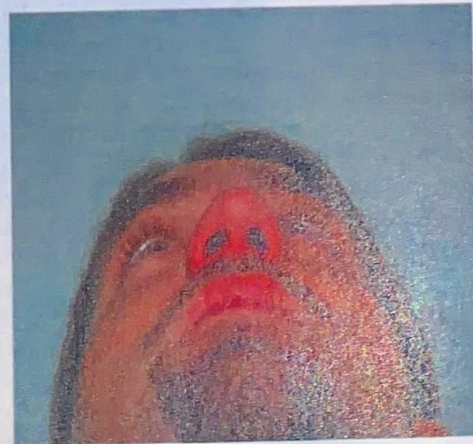
A



B



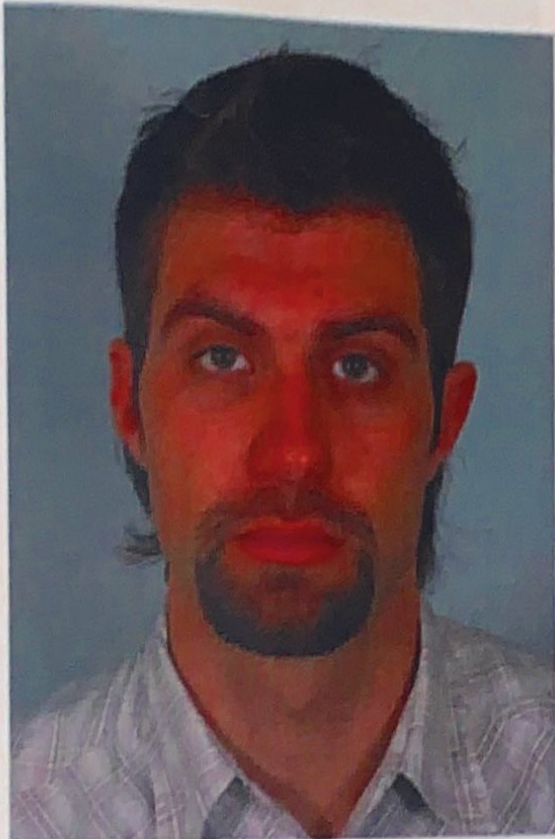
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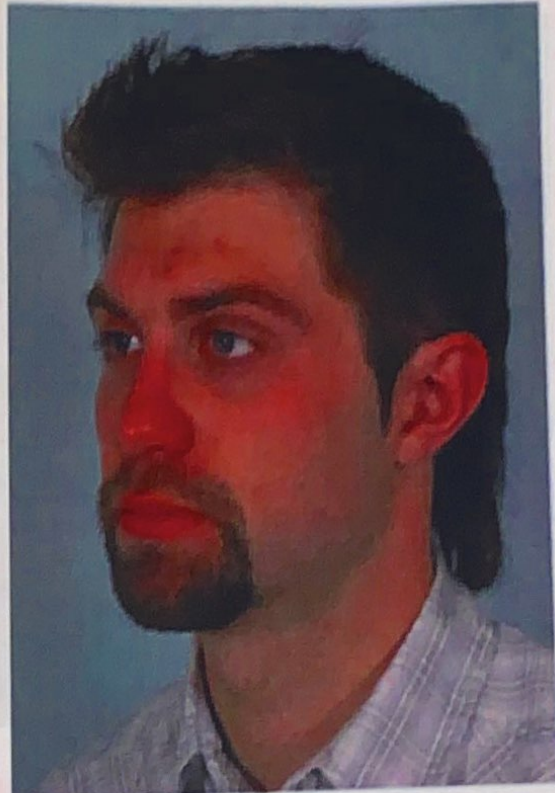
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after injury

Figure 183.8 Case One. This is a 25-year-old male with a **posttraumatic nasal deformity**. He has a history of a prior reduction of a nasal septal fracture. He complains of **persistent nasal obstruction** and nasal deformity obscured by thick skin. Preoperative (A–D,I) and postoperative (E–H,J) photos can be seen here.



E



F



G



H

Figure 183.8 (Continued)

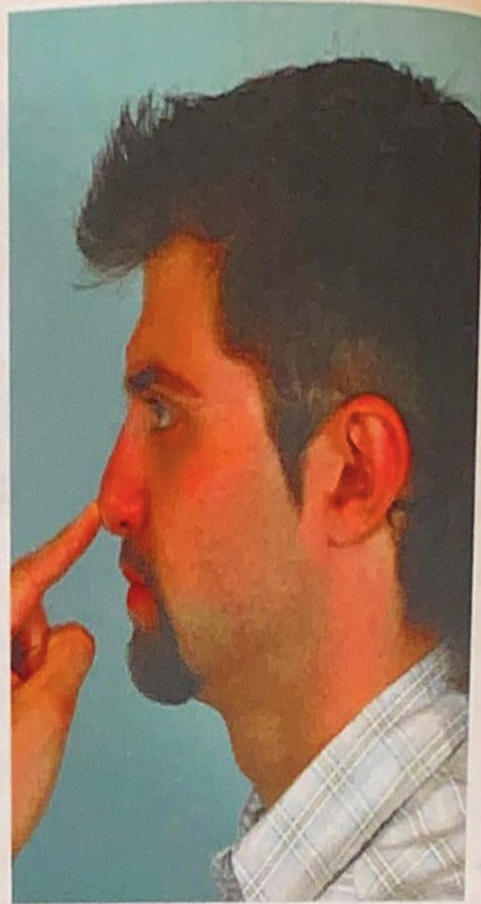
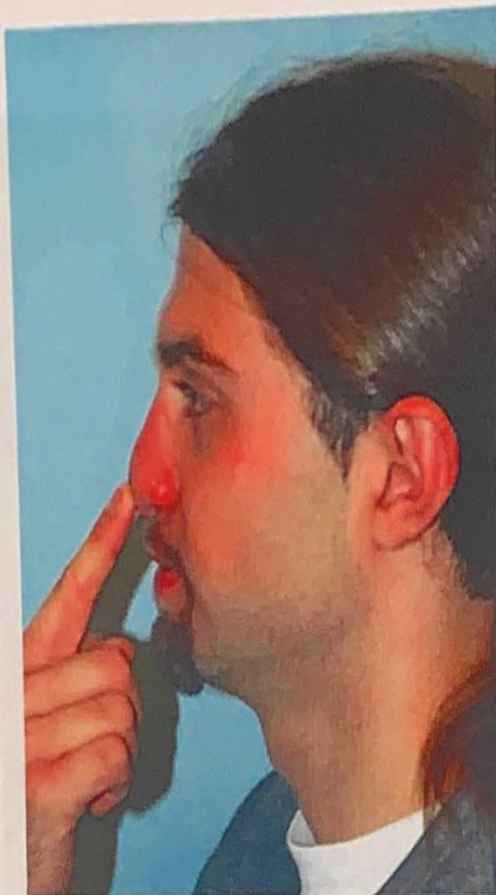
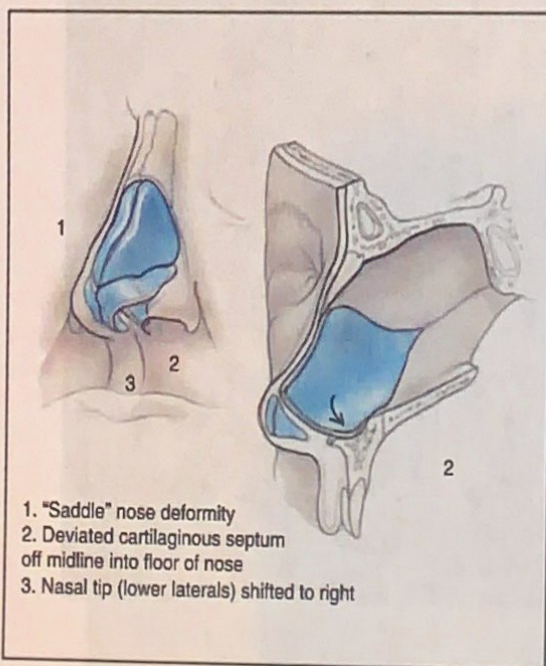
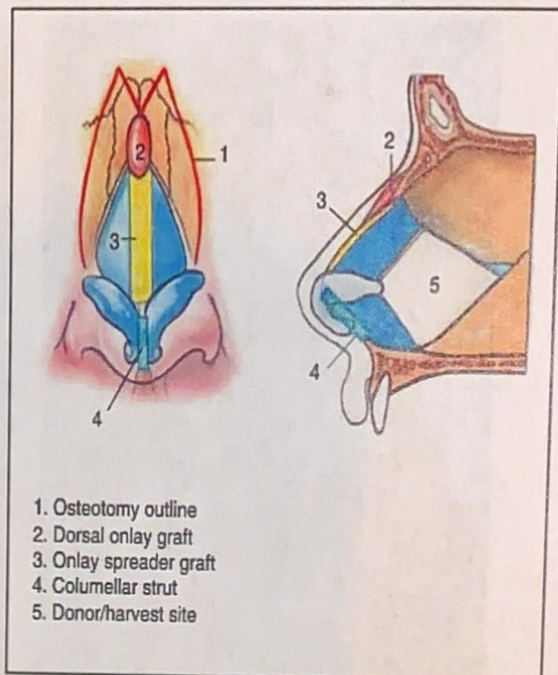


Figure 183.8 (Continued)



1. "Saddle" nose deformity
2. Deviated cartilaginous septum off midline into floor of nose
3. Nasal tip (lower laterals) shifted to right

Figure 183.9 The patient in Case One has a saddle deformity that is a depression of the middle third. The septum is depressed into the left nasal cavity, which causes deviation of the middle third. The lower lateral cartilages are not in contact with the septum because the tip is deviated to the right. Disarticulating the septum from the maxillary crest allows the surgeon to rotate the septum upward to increase dorsal height. This acts to reduce the saddle depression and also places the septum between the medial crura of the lower lateral cartilages. This all helps straighten the middle and lower thirds.



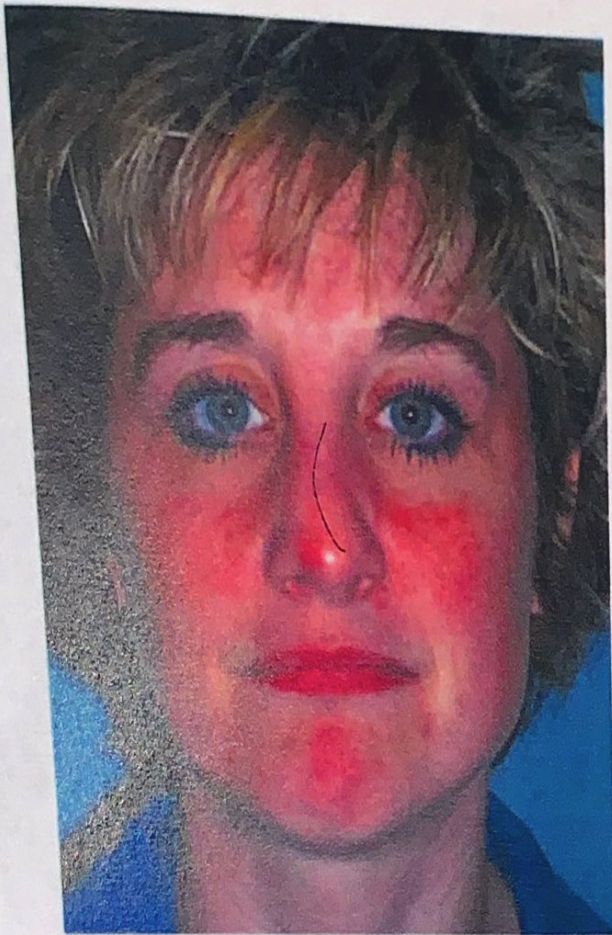
1. Osteotomy outline
2. Dorsal onlay graft
3. Onlay spreader graft
4. Columellar strut
5. Donor/harvest site

Figure 183.10 To create a nasal structure that maintains a straighter shape, the patient in Case One underwent open (external) septorhinoplasty. Autologous septal cartilage was used. The upper third was straightened with bilateral medial and bilateral lateral osteotomies. To straighten the middle third, he underwent the septal procedure described in this figure along with onlay spreader and dorsal onlay graft. The onlay spreader graft provides more dorsal augmentation to improve the saddle deformity. It also creates a higher support for the upper lateral cartilages and opens (increases) the internal nasal valve angle for better long-term breathing. The dorsal onlay graft was used for augmentation to create a uniform dorsum. To straighten the lower third, in addition to the septal procedure, a columellar strut helps keep the tip straight and supports the tip.

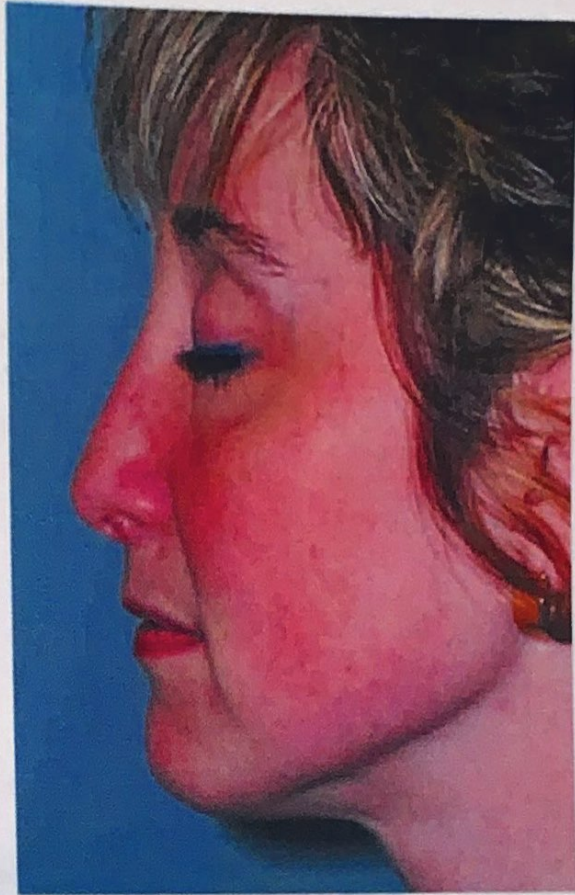
Lower 3rd = columellar strut

upper 3rd = osteotomies

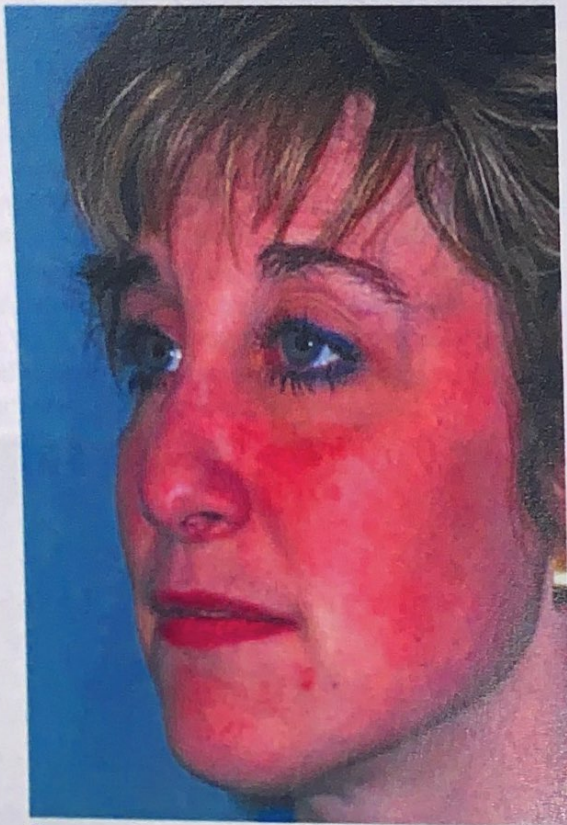
mid 3rd = onlay grafts and spreader grafts



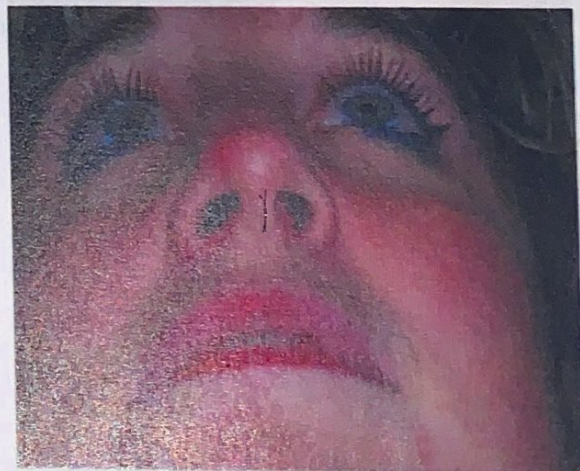
A



B

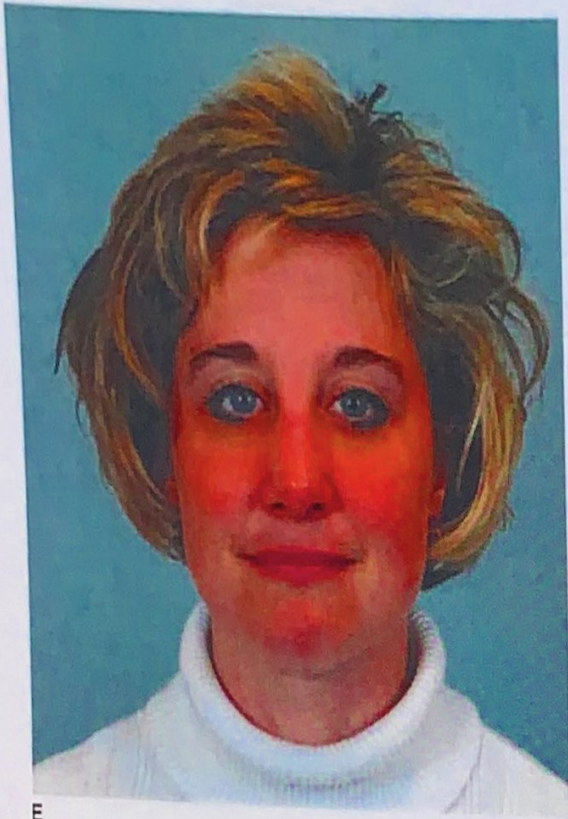


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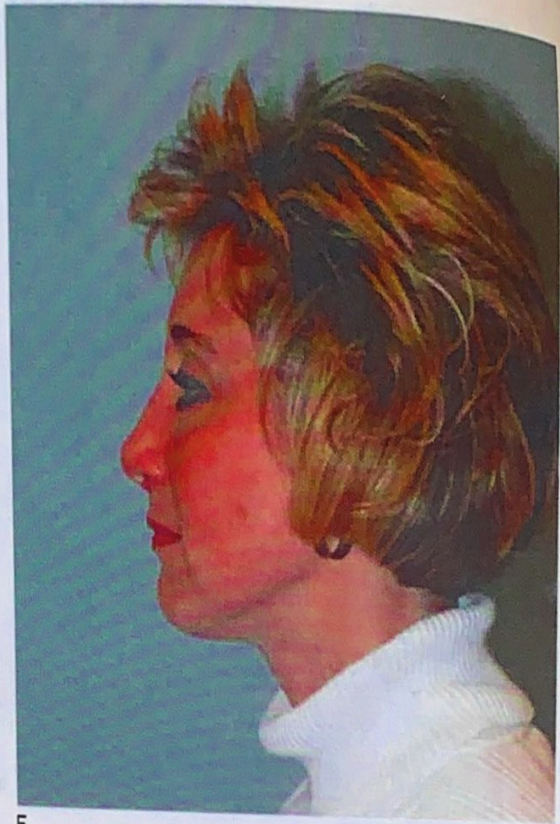


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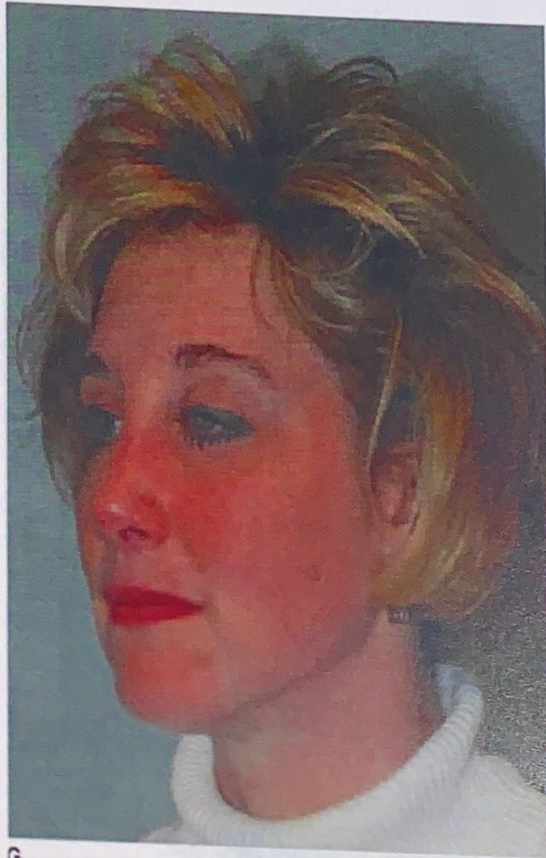
Figure 183.11 Case Two. This is a 30-year-old female patient who had childhood nasal trauma. She had a prior septorhinoplasty. She presented with a deviated nasal tip, twisted dorsum, severe caudal septal deflection to the left, concave left upper lateral cartilage, convex right upper lateral cartilage, and a buckled left lower lateral cartilage. Preoperative (A–D) and postoperative (E–H) photos can be seen here.



E



F



G



H

Figure 183.11 (Continued)

For onlay grafts, the ideal material is carved septal cartilage, followed by crushed septal or auricular cartilage, and then costal cartilage. Crushing must be kept to a minimum. The cartilage is crushed just enough to create a soft pliable layer that can be draped over the area of deficiency. It is best to place such grafts at the end of the case when the incisions are nearly closed so that the grafts do not get displaced. If necessary, the grafts can be sutured into position with either a fine monofilament absorbable or permanent suture.

ideal material for onlay graft = carved septal cartilage

place grafts last

Lower Third

Anatomically, the lower third of the nose consists of the paired lower lateral cartilages, the caudal nasal septum, and the nasal spine. Careful inspection and palpation can help the surgeon mentally "deglove" the nose to visualize a three-dimensional virtual image of the structures below. Palpation of the septum in relation to the maxillary spine can help determine whether the septum is dislocated from the midline. Deviations of the lower third are often due to deflections of the caudal septum or deviation of the lower lateral cartilage. However, at times, the lower lateral cartilages are asymmetrically malformed causing deviation of the nasal tip. Asymmetry of the lower lateral cartilage can be due to congenital variation, aggressive iatrogenic resection, or traumatic alterations. The two lower lateral cartilages may have significant differences in shape and size. Correction of the lower lateral cartilages to achieve symmetry can be performed with a number of methods. Many surgeons prefer the external approach for severe lower third asymmetries since the asymmetries are easier to visualize *in vitro*. Endonasal approaches can equally address the issue found in the crooked nasal deformity. Ultimately, the choice of approach depends on each surgeon's comfort and experience. The surgeon must decide whether a surgical attempt at repositioning or modifying the lower lateral cartilages back to a symmetric tripod is possible, or if it is better to use camouflage augmentation or reduction techniques to create tip symmetry.

cause lower 3rd asymmetry or lower lateral cartilage deflection of caudal septum

Lower lateral cartilages that are severely distorted and asymmetric should be mobilized by releasing scar tissue and the vestibular mucosa. Some grafts such as the columellar strut and alar batten grafts (or lateral crural strut grafts) provide structural support. Once the structural integrity is returned, onlay grafts of crushed or carved cartilage can be used to improve symmetry. Suture shaping techniques, whereby a surgeon shapes the cartilages using mattress sutures, is a safe and effective way to shape the lower lateral cartilages without the risk of irrevocably damaging the cartilages if the attempt fails (15). For this reason, suture techniques have become very common. When the nasal tip is severely deviated, one often finds marked asymmetry between the two lower lateral cartilages, especially when the asymmetry is congenital or long-standing. The longer medial or lateral crura may require shortening or the shorter sides lengthening. The surgeon must balance these decisions based on the status of tip projection and rotation (Fig. 183.12). Dividing the longer crura and suturing the

can outline reduction or surgical

suture shaping techniques to shape lower cartilage

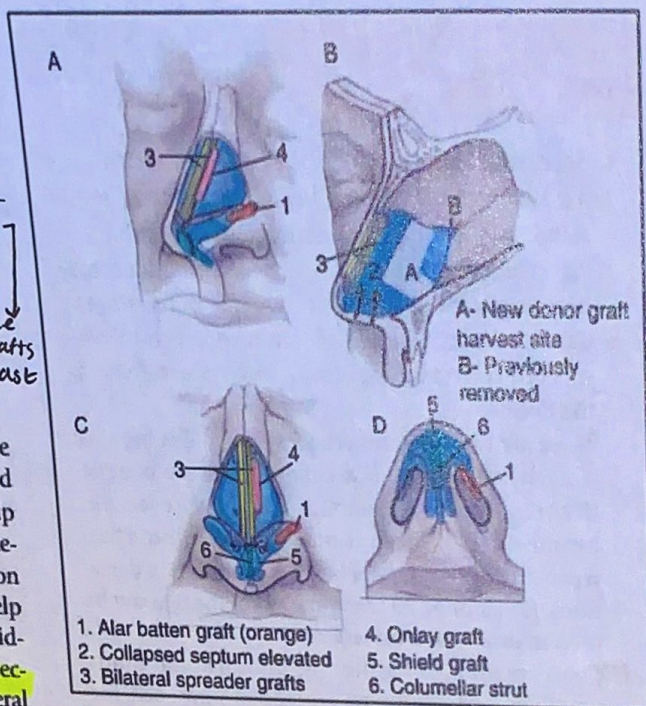


Figure 183.12 The patient in Case Two underwent revision open (external) rhinoplasty. Autologous septal cartilage was used, along with ear conchal cartilage graft. The upper third was straightened using bilateral medial and bilateral low-high-low osteotomies. To straighten her middle third, bilateral spreader grafts were placed, along with a left dorsal onlay graft to account for the concavity of the upper lateral cartilage. Her collapsed septum was also elevated as in Case One (black curved arrows), but to a lesser degree. To straighten her lower third, a combination of suture techniques were used along with a left alar batten graft and columellar-strut. Finally, a shield graft was placed for increased tip projection and definition.

shield graft for tip

overlapping segments at a length symmetrical with the contralateral lower lateral cartilage will shorten and stabilize the longer crura. The authors prefer 6-0 polypropylene suture for this purpose since they are permanent and nonreactive.

FINISHING TOUCHES

After the nose is straightened, the surgeon should view the patient from the head of the bed to ensure the nose is at midline. This view helps pick out minor asymmetries along the entire length of the nose. Final camouflage grafts may be necessary using thin pieces of crushed or lightly scored cartilage. Septal splinting may be helpful in maintaining a straight septum and preventing blood or serum collections, which can result in areas with increased thickness. An external thermoplastic splint is applied to maintain the nose at midline. It cannot be used to straighten a nose that is crooked at the end of the operation. The tape and splint stay on for 6 to 7 days. Postoperative massage may be helpful. Patients are instructed to apply gentle pressure to the lateral nasal walls using the sides of the index finger while the palms of the hand are facing outward. This is done three to four times a day while facing a mirror during the second postoperative week. Patients are then seen by the surgeon at 1, 6, and 12 months during their postoperative recovery.

why are they instructed to apply pressure?

HIGHLIGHTS

- Successful management of the crooked nose requires a systemic approach that begins with a clear understanding of the patient's desires and symptoms.
- Any maneuver that improves a nose aesthetically may have implications in the functionality of the airway.
- Careful thought should be given to which maneuvers can correct the deformity without destabilizing the nose.
- There are two basic approaches toward dealing with a deviation: camouflage strategy and deconstructive/reconstructive. Camouflage is best for smaller asymmetries or depressions, and deconstructive/reconstructive strategy is best for more severe deviations. Either one or a combination of the two can be used to deal with a deviation.
- Conceptually dividing the nose into anatomic thirds simplifies and organizes a planned approach for each third with a strategy to correct it individually.
- After careful consideration to what is causing the deviation of the specific third, the forces that cause the deformity must be released. In posttraumatic or post-surgical cases, releasing scar tissue and the vestibular mucosa may be necessary to improve the asymmetry.
- After release and repositioning of the structures, the structures must be resutured in a way to construct a straight and stable framework.

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