Perforating Double Lateral Osteotomy

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Reshaping of the bony vault in primary and revision rhinoplasty is a simple, yet precise, maneuver that requires both skill and experience in creating predictable outcomes. Different methods for remodeling the nasal pyramid using various types of osteotomies have been devised to achieve narrowing, straightening, and reduction in nasal height. However, the current options of techniques including medial, transverse oblique, low to low lateral, low to high lateral, and intermediate osteotomies do not address all types of deformities encountered. These include the wide pyramid, the prominent frontal process of the maxilla, the convex nasal bone, and the deviated nose. Accordingly, the senior author has devised a new procedure, named the "perforating double lateral osteotomy," that has been used on hundreds of patients, with excellent results. *Arch Facial Plast Surg. 2005;7:257-260*

The "perforating double lateral osteotomy" differs from conventional methods of bony vault reshaping in several ways. In the most basic sense, it displaces the frontal process of the maxilla in a medial direction, providing the medialized nasal bones a foundation on which to rest. It has multiple applications in cosmetic rhinoplasty, and it is an essential component in achieving a desirable esthetic result in selected cases. These include (1) narrowing of the wide nose, (2) reshaping of the convex nasal pyramid, (3) recreating symmetry in the traumatic nose, (4) reducing the wide and prominent maxillary process, and (5) eliminating ledges in primary and revision rhinoplasty.

In the few publications on the subject[1,2] and when addressed in the textbooks on rhinoplasty,[3,4] 2 curvilinear osteotomies using a guarded osteotome are described. This often takes the form of an intermediate osteotomy across the bony pyramid, with a lower one at its base, creating a pentagonal structure to correct the convexity of the nose. One of us (W.L.) had originally used this method but replaced it with a series of bony perforations made with a 3-mm chisel. This modification was made for several reasons: (1) in some instances creating a long continuous segment of bone (with intermediate osteotomies) tended to displace the nasal bone on infracture; (2) perforating the bone in several areas (creating the second osteotomy) resulted in its comminution and facilitated its molding along the face of the maxilla; (3) with wide maxillary attachments, multiple osteotomies could be selectively made for maximal lowering without disturbing the bone at the pyriform aperture and reducing airflow; and (4) perforation rather than a continuous osteotomy resulted in less soft tissue trauma (**Figure 1**).

With the wide nose, the perforating double lateral osteotomy facilitates infracture and closure of the open roof. This is achieved by narrowing the base on which the newly formed isosceles triangle rests, reducing the tendency toward postoperative widening. A single osteotomy with convex nasal bones may achieve closure of the nasal roof, but it leaves a broad and unattractive nose with limited shadowing on the nasal sidewall. Creating a concave configuration at the face of the maxilla with double osteotomies produces a narrower-appearing nose with deeper shadowing of the lateral contours.

The traumatically deviated nose is often asymmetric with the longer side away

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from the deflection: a pyramid deviated to the right will have an elongated left nasal bone (**Figure 2**). The longer side also tends to have a more prominent attachment to the maxilla and often has a convex shape. On rare occasions, the longer side may have a concave contour but is treated in a similar fashion.

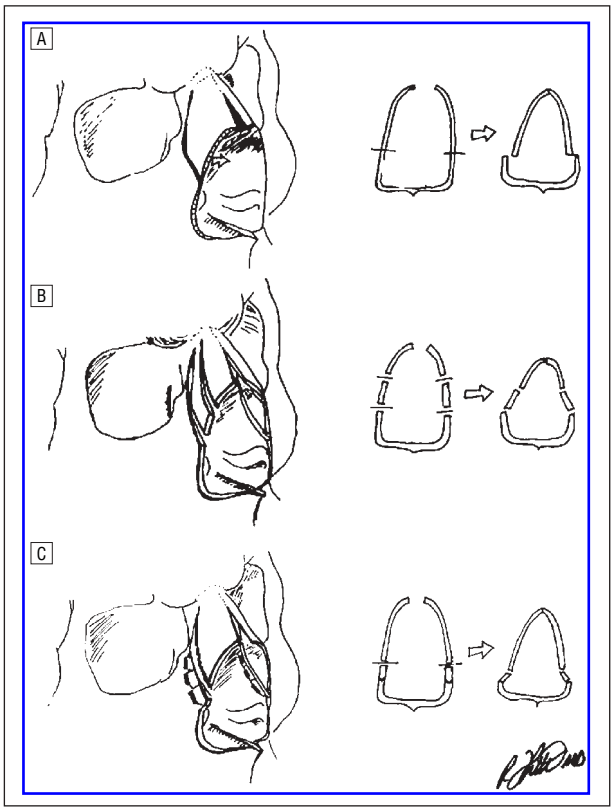

Figure 1. Methods of lateral osteotomy. A, Low to high osteotomy: it closes the open roof and narrows the nose but produces convex bones with an inferior ledge. B, Low to high and intermediate osteotomy: it produces pentagonal nasal bones with less concavity of the nasal sidewalls and can leave an inferior ledge. C, Perforating double lateral osteotomy: it produces maximal narrowing down to the face of the maxilla without leaving an inferior ledge.

It is widely accepted that correction of the deviated pyramid requires reshaping techniques that create nasal bones of equal length. The use of asymmetric lateral osteotomies and a unilateral intermediate osteotomy has been suggested; however, their exact placement to achieve a predictable result may be difficult to assess. The intermediate osteotomy also narrows the pyriform aperture in a more dorsal location that may either cause or exacerbate nasal obstruction after infracture. Rees[5] has suggested asymmetric dorsal reduction using either a rasp or an osteotome. Although effective when performed correctly, it carries the risk of overreduction with an open roof deformity that cannot be easily closed. This tech-

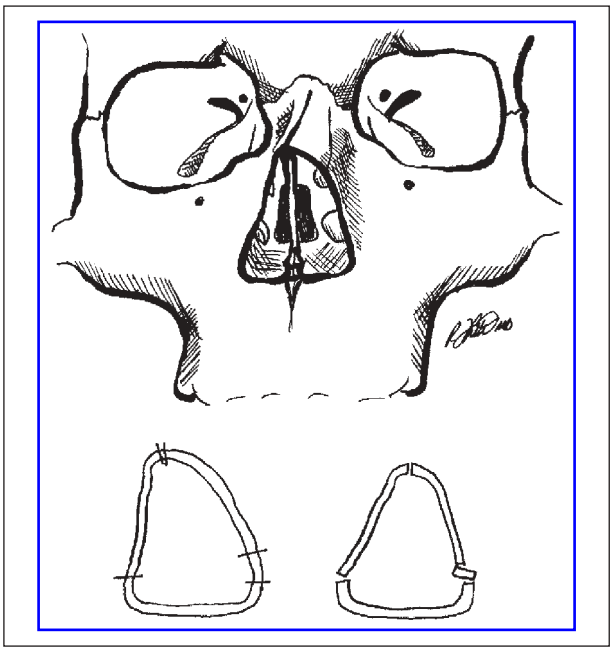

Figure 3. Schematic of deviated nose with recommended osteotomies. Double lateral osteotomy performed on the longer side of the nose effectively medializes frontal process of maxilla and creates equal nasal bone segments for pyramid reshaping.

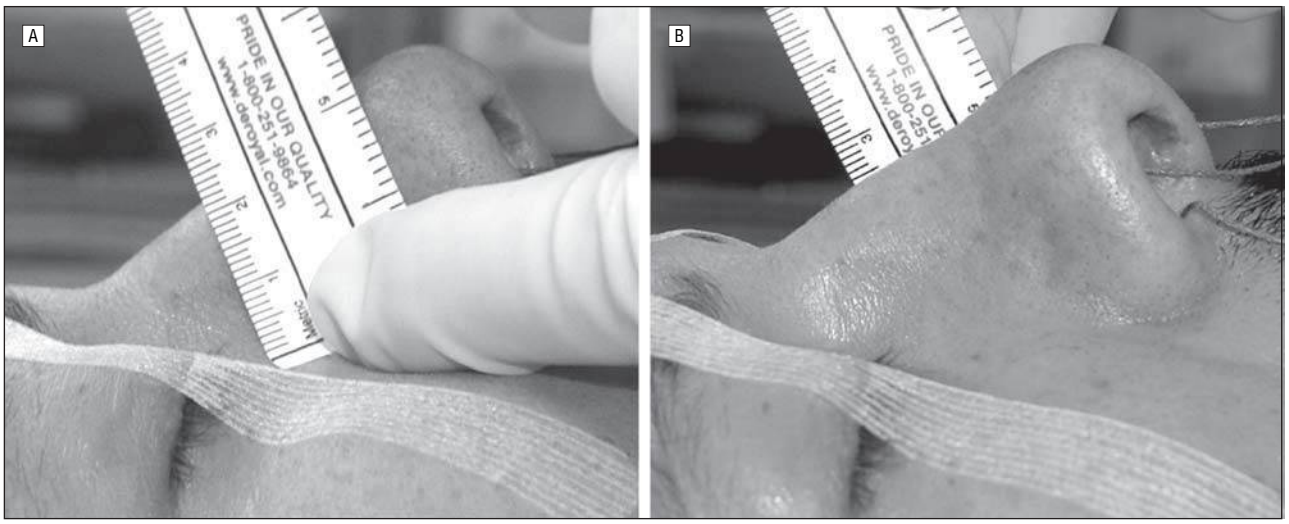

Figure 2. The traumatically deviated nose. Intraoperative photograph showing marked difference in measurements (A and B) made along the caudal edge of the nasal bone. Both measurements were made from the face of the maxilla to the rhinion. Note the 3- to 4-mm difference in nasal bone length when comparing right (2.1 cm) and left (2.5 cm) sides.

nique is also not applicable if dorsal height reduction is not desired.

After using these suggested maneuvers, we remained displeased with the predictability and esthetic outcomes. Therefore, the senior author (W.L.) devised a method of correction using bilateral medial and low to high lateral osteotomies with a unilateral perforating double osteotomy on the elongated side (**Figure 3**). The low to high lateral osteotomy on the elongated side is performed slightly higher than the contralateral one. The unilateral perforating double osteotomy then eliminates the excessive convexity and reduces the thickened junction with the maxilla on the more deformed side. The combination of these maneuvers effectively medializes the frontal process and shortens the nasal bone on the elongated side, producing an isosceles triangle.

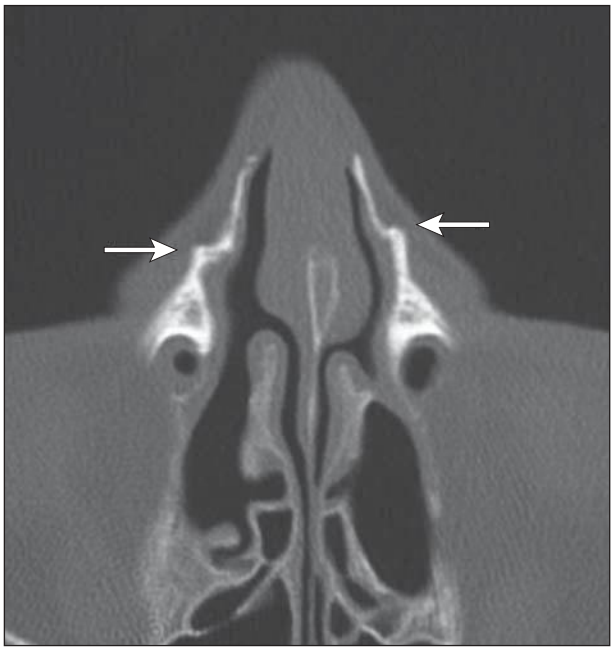

Figure 4. Ledges. Axial computed tomographic scan showing a residual bony ledge present 10 years after rhinoplasty performed by another surgeon (arrows).

In patients with thick, wide, and prominent attachments of the nasal bones to the frontal process of the maxilla, a conventional single lateral osteotomy resists infracture, produces a long convex bony segment, and leaves a ledge of palpable or visible maxillary bone (**Figure 4**). This often occurs because the thick bony attachment is difficult to section and tends to direct the chisel upward into the thinner nasal bone. Patients may be seen for revision surgery because of the unsightly appearance of these residual prominences that often detract from the total esthetic effect of an otherwise successful rhinoplasty. During primary rhinoplasty, the lateral osteotomy may be inadvertently made too high leaving a ledge that requires removal. Prompt recognition of this event allows for simple correction following the initial osteotomy.

TECHNIQUE

The primary osteotomy is performed through a small incision in the nasal mucosa lateral to the pyriform rim, with a straight or curved chisel, in a low to high fashion. The periosteum is not elevated by the preliminary creation of a tunnel. The osteotomy is begun along the pyriform aperture above the level of the inferior turbinate and proceeds in a curvilinear fashion above the inner canthus of the eye toward the nasion. Following infracture, the 3-mm chisel is introduced through the same incision and a series of punch osteotomies are made at the lower level of the convex bony attachment (**Figure 5**). The chisel is held as close to a right angle to the bone as possible (**Figure 6**). The chisel is held tightly with the hand resting against the face to sense when the bone is penetrated and to prevent its further passage into the nose. The bony fragments are molded inward with thumb pressure. If any residual ledging remains, it is reosteotomized in a similar fashion.

CONCLUSIONS

One of us (L.W.) has used this method in more than 200 cases without a significant complication. The low second osteotomy may produce increased but transient

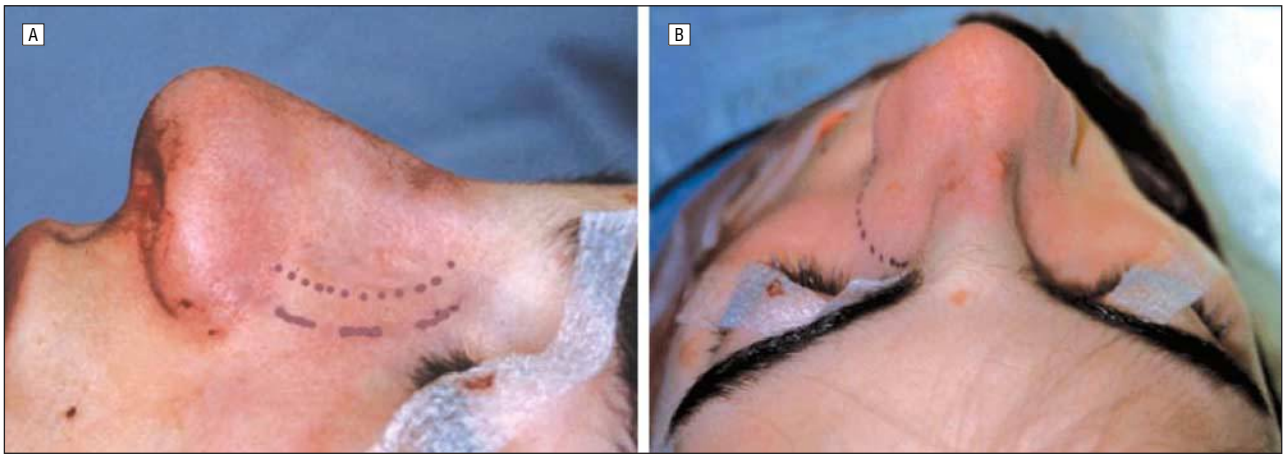

Figure 5. Intraoperative photographs of a patient with thick attachments of the frontal process of the maxilla. A, Dotted line represents conventional low to high osteotomy. Dashed line represents the path of the perforating double lateral osteotomy. B, Right double lateral osteotomy completed. Left low to high osteotomy after infracture. Dotted line indicates the projected path of perforating double lateral osteotomy.

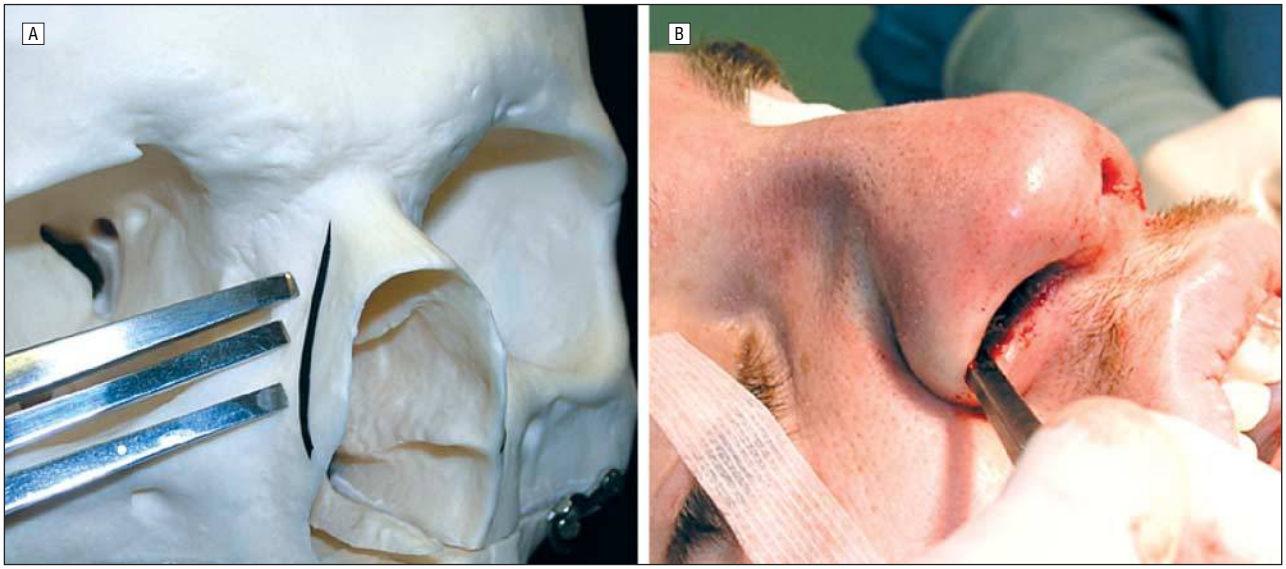

Figure 6. Diagram of technique. A, Multiple perforations made along frontal process of maxilla with 3-mm chisel. B, Intraoperative appearance during osteotomy.

eyelid ecchymosis and facial edema. Limited elevation of the soft tissues over the nasal bones and avoiding subperiosteal tunnels for the lateral osteotomy has prevented both floating nasal bones and nasal collapse. The creation of independent comminuted fractures of the maxillary process reduces the force necessary for infracture of the nasal bones and prevents excessive narrowing of the nasal pyramid dorsally. Injury to the lacrimal apparatus, or medial canthal ligament, has not occurred. Functional nasal obstruction is prevented by preservation of the lower portion of the pyriform aperture.

The perforating double lateral osteotomy is a novel technique for bony vault remodeling that is a valuable adjunct to existing methods of rhinoplasty. It serves to eliminate several potential complications in primary rhinoplasty and is useful in certain revision cases. The procedure can be performed safely and without additional complications in the proper setting.

Accepted for Publication: March 2, 2005.
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