

Chapter 23 . Upper Lateral Cartilages: Grafting Techniques

- The cartilaginous portion of the dorsum contains the transition zone between the upper lateral cartilages and the midline septum. On cross section, this is not a sharp angle but a well-supported and gradual curve. With resection of the dorsal septum, collapse of the middle vault may occur as the upper lateral cartilages fall towards the septum in a more acute manner. In the absence of structurally sound upper lateral cartilages, collapse of the nasal sidewall or asymmetry can occur and require reconstruction with a cartilage graft of similar quality. Spreader grafts are indicated to reconstruct compromised dorsal aesthetic lines, open roof deformities, and nasal deviations.¹
- *Assessment and Markings:* No specific markings are necessary for planning and placement of cartilage grafts for support of the middle cartilaginous vault. The presence of a nasal deviation, open roof deformity, or compromised dorsal aesthetic outline should be identified. The grafts will ultimately lie on either side of the dorsal septum. If upper lateral cartilage collapse has caused a loss of a dorsal aesthetic line, the septal graft can be placed more dorsal on the septum to restore this lost fullness. Spreader grafts can also be fashioned to extend beyond the anterior septal angle as a septal extension graft. In this case the extension graft serves as a stable strut to which the lower lateral cartilage (tip) complex can be sutured to control nasal tip rotation and projection. Septal cartilage is the ideal material for spreader grafts; however, rib or ear cartilage can be used if septal cartilage is unavailable. The inherent warping nature of the rib cartilage may be advantageous in correcting nasal deviation.²
- *Approach:* Approaching the upper lateral cartilages may be achieved via either a closed or an open rhinoplasty. With an open approach, a transcolumellar incision is continued superiorly and laterally along the infracartilaginous alar rim. Dissection above the lower lateral cartilages and along the midline dorsum may be extended laterally to identify the upper lateral cartilages. A clear junction between the midline septum and upper lateral cartilages is often difficult to appreciate. If the caudal septum is approached by separating the lower lateral cartilages and dissecting along the septum in a submucosal plane, the upper lateral cartilages may be identified by reflecting the mucosa closest to the dorsum.
- *Technique:* Cartilage sufficient for structural support is harvested from the septum if it is present. This should be determined in the preoperative consult. Costal cartilage may also be used for this purpose and is favored by some. Conchal cartilage is frequently more convoluted, thinner, and softer making it less ideal for spreader grafts. However, with the introduction of the PDS flexible plate (Mentor™) as a reinforcing material, its use may be expanded in this indication.
- Septal cartilage may be harvested through a separate unilateral mucosal incision leaving the most dorsal portion of the septum untouched for later positioning of the grafts. The caudal portion of the septum is then transected preserving the contralateral mucosa to minimize the risk of a perforation. Dissection is continued posteriorly and inferiorly on both sides of the septum. A strut of at least 1 cm is preserved to maintain support to the lower half of the nose (Figure 23-1). Septal cartilage may also be harvested via a caudal approach between the medial crura of the lower lateral cartilages (Figure 23-2).

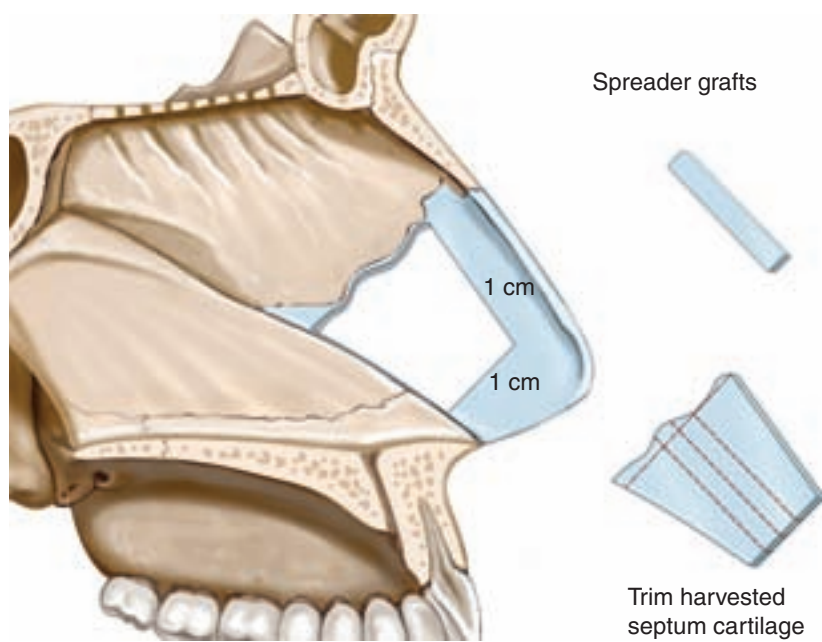


Figure 23-1 Harvested nasal septum for use as spreader grafts.

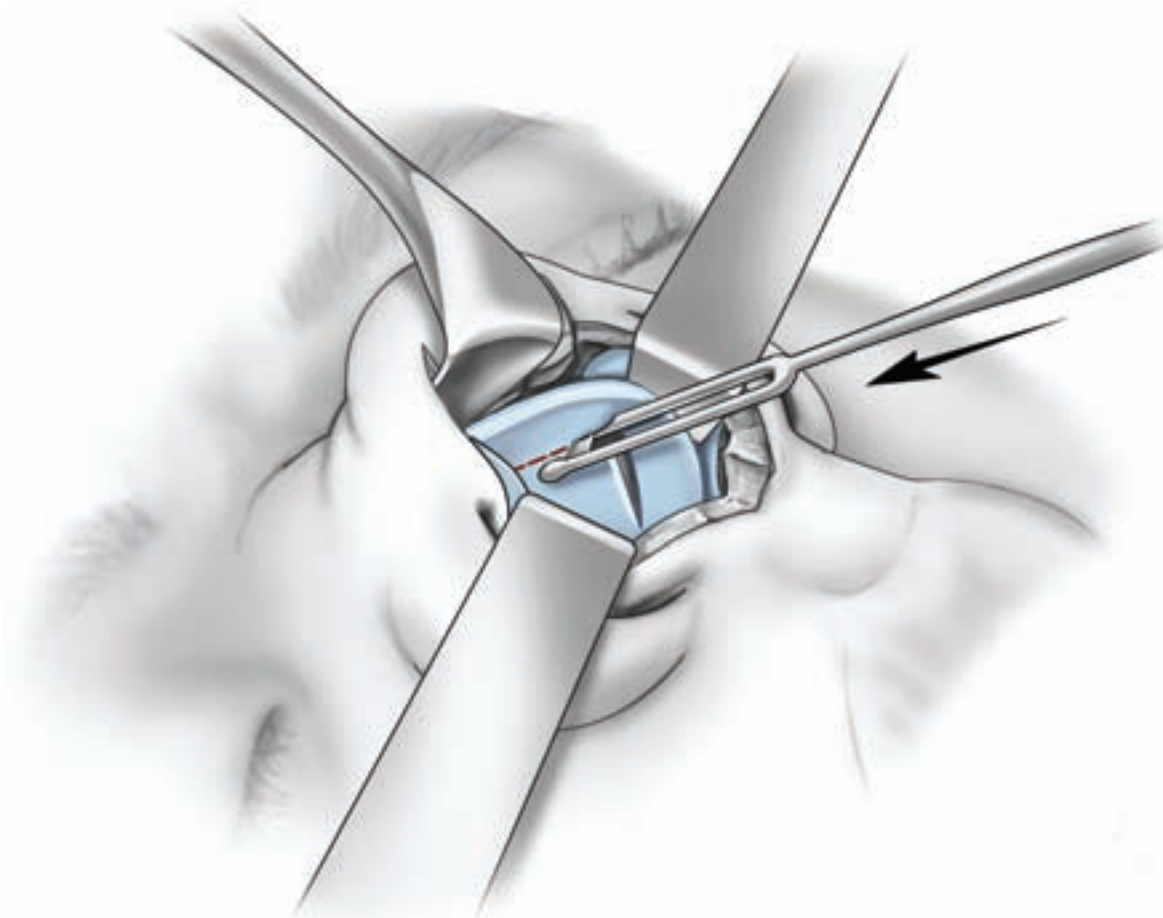


Figure 23-2 Use of a Ballenger swivel knife to harvest septal cartilage. The paired ribbon retractors protect the mucosa.

- Costal cartilage is harvested from the more medial portions of the ribcage as described earlier.
- Conchal cartilage can be reinforced with a PDS flexible plate to add rigidity and eliminate curvature expanding its application as a spreader or extension graft.
- Following harvest of sufficient graft material, one or two absorbable 4-0 gut mattress sutures should be placed across the mucosal septum. If the mucosa is not approximated there is a potential space for blood and fluid accumulation.
- For spreader grafts, the harvested cartilage is placed onto a sterile cutting surface so that two equal grafts may be fabricated. This is best done with a fresh #15 scalpel blade. The size of the grafts should measure 20 mm to 25 mm in length and 3 mm to 4 mm in height and width.
- The spreader grafts are positioned on either side of the dorsal septum medial to the upper lateral cartilages (Figure 23-3). The superior end of each graft should lie beneath the caudal end of the bony vault (Figure 23-4). With the closed technique, two tunnels are created along each side of the most dorsal aspect of the septum. If a tight pocket is created, it is conceivable that sutures may not need to be placed. With the open technique, two or three sutures will serve to hold the grafts in place. Since both suture needles should pass through five layers (right upper lateral cartilage, right spreader graft, septum, left spreader graft, and left upper lateral cartilage), it is helpful to set up the construct using two 25-gauge needles passed across all components of the dorsal septum—one cranial and one caudal (Figure 23-5). Alternatively, each spreader graft can be sutured independently with approximation of the upper lateral cartilages performed after placement of the spreader grafts. The grafts are sutured into place with two or three clear, 5-0 permanent monofilament or PDS sutures. One suture will generally not suffice since it allows the grafts to rotate within the sagittal plane. The knots may be buried between one of the layers to minimize their palpability. Before completion, the reconstructed dorsum should be checked to confirm that it is smooth and that none of the graft edges are palpable beneath the dorsal nasal skin envelope.
- Autospreader grafts can be used when a significant amount of cartilaginous septum is reduced and excess upper lateral cartilage remains above the leading edge of the septum. This redundant cartilage is folded medially towards the septum and sutured together.³ In this instance, the upper lateral cartilages serve as their own spreader grafts to increase the internal valve angle.
- Onlay graft material that is used to camouflage deficient upper lateral cartilage should be morcellized or beveled at its edges to minimize the risk of visibility. It may be sutured at its medial aspect to avoid postoperative migration.
- *Postoperative management:* An internal nasal splint composed of either resorbable or nonresorbable material should be used postoperatively. Resorbable material includes Gelfoam sponge; nonresorbable material includes plain petroleum gauze or petroleum gauze with bismuth (Xeroform®). Antibiotics should be used in patients with nonresorbable packing to minimize the risk of infection and toxic shock syndrome.
- *Pitfalls:*
 - Preservation of the nasal mucosa is important and care should be exercised in dissecting the upper lateral cartilages and nasal septum. This may be done with a Freer or Cottle elevator being careful to maintain contact between the tip of the instrument and the cartilage.
 - Over-resection of the upper lateral cartilages, in an attempt to lower the cartilaginous nasal dorsum, will further weaken the support of the middle vault.
- *Tips:*
 - Small, incremental changes in the upper lateral cartilages should be performed to avoid over-resection.
 - Once the spreader grafts are positioned along the septum and held in place with two 25-gauge needles, it is helpful to suture the caudal end first since it is easier to visualize.
 - If the graft(s) are well sutured into place, it is usually safe to save lateral osteotomies and fracturing to the end especially if the osteotomies are complete and the force needed to move the nasal bones is minor.

REFERENCES

1. Sheen JH. Spreader graft: A method of reconstructing the roof of the middle nasal vault following rhinoplasty. *Plast Reconstr Surg.* 1984;73:230.
2. Byrd HS, Andochick S, Copit S. Septal extension grafts: A method for controlling tip projection and shape. *Plast Reconstr Surg.* 1997;100:999.
3. Seyhan A. Method for middle vault reconstruction in primary rhinoplasty: Upper lateral cartilage bending. *Plast Reconstr Surg.* 1997;100:1941–1943.

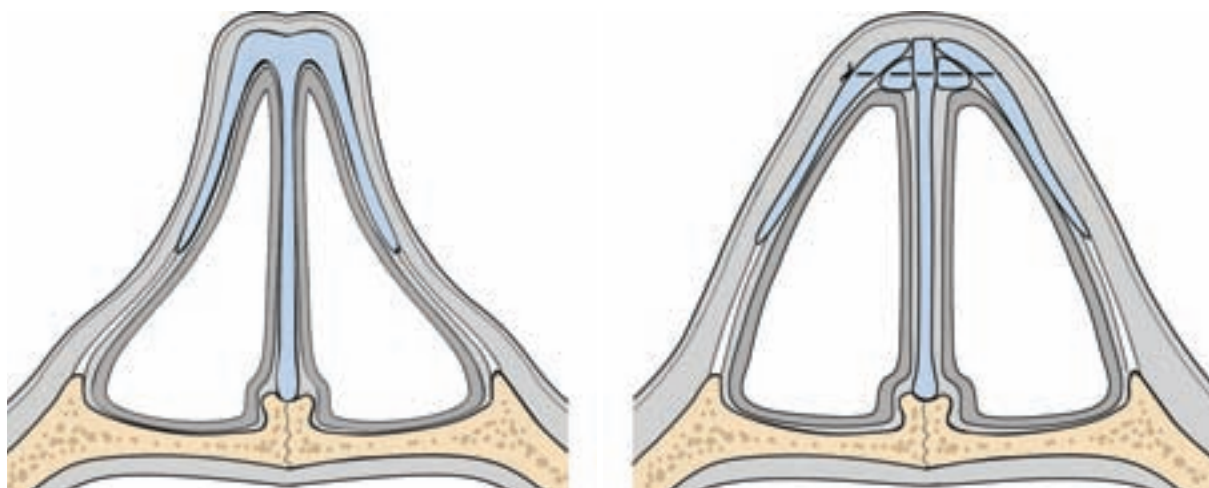


Figure 23-3. Placement and function of spreader grafts.

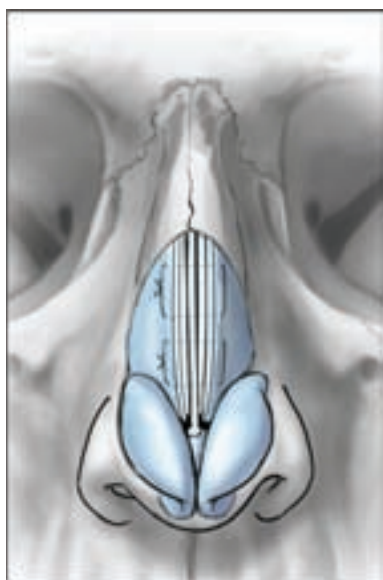


Figure 23-4. Dorsal septum with spreader grafts in place.

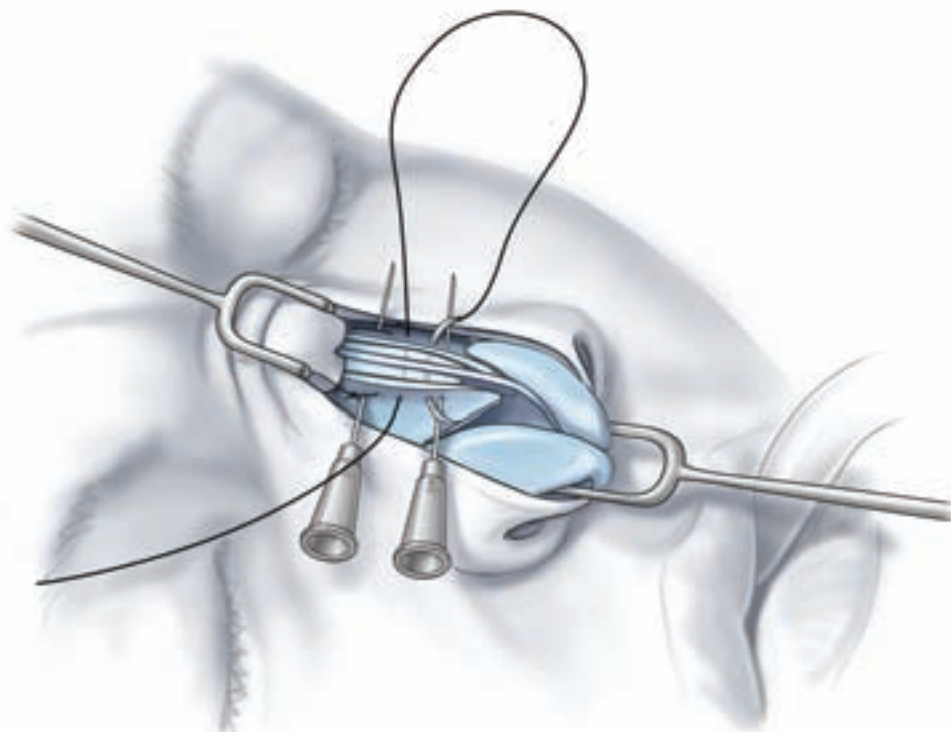


Figure 23-5. Use of syringe needles to stabilize spreader grafts.