

JAMA Facial Plastic Surgery Clinical Challenge

Extended Butterfly Graft for Functional and Cosmetic Correction of Saddle Nose Deformity

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Figure 1. Preoperative (A) and postoperative (B) clinical views of a patient who underwent an extended butterfly graft procedure. Illustrated are profile, oblique, and base views. Note correction of bony and cartilaginous components of the saddle defect with resolution of nasal collapse using the extended butterfly graft.

We present a case of a middle-aged woman with saddle nose deformity after prior rhinoplasty. The patient related concerns of chronic nasal obstruction, which had worsened in the years since her procedure. She was also concerned about the appearance of her nose. She wished to have the deformity corrected and to have normal breathing restored.

Examination demonstrated severe nasal saddling with collapse of the cartilaginous dorsum and a deficient bony dorsum due to prior overresection. In addition, the upper lateral cartilages demonstrated an inverted-V deformity. Her nasal tip was overrotated, and the lower lateral cartilages (LLCs) were weakened, producing a pinched nasal deformity (Figure 1). Findings of the Cottle maneuver were positive. Marked internal nasal valve collapse was present, causing substantial functional deficit. Much of the septal cartilage had been resected.

Diagnosis

Severe nasal saddling, collapse of cartilaginous dorsum, and deficient bony dorsum due to prior overresection

What to Do Next

C. Extended butterfly graft

Discussion

Saddle nose deformity results from loss of support structures that maintain the middle nasal vault. The deformity is associated with collapse of the dorsal septum and ULCs. As the present case demonstrates, saddle nose is a progressive deformity, increasing in severity over time as the weakened midline structures buckle and the midvault collapses. Saddle nose deformity represents a substantial reconstructive challenge, and

it is frequently associated with a dysfunctional internal nasal valve. Severe cases like the one presented here may include deficits of the bony dorsum in addition to loss of support of the mid vault and internal nasal valve.¹

Three potential treatment options are illustrated in Figure 2. However, the extended butterfly graft is the only option shown that will adequately correct the deformity of the bony dorsum. This graft uses a more generous cartilage graft placed over the caudal portion of the nasal bones and the wings covering the collapsed lateral wall caudally in an onlay fashion. It is secured with primary sutures at the bony dorsum and secondary sutures placed at the wings of the graft, thereby correcting the functional and aesthetic deficit in the lateral nasal walls. Secondary stitches transmit the natural spring effect of the conchal cartilage into the internal nasal valve, restoring nasal patency and natural

WHAT WOULD YOU DO NEXT?

- A.** Cook butterfly graft
- B.** Stucker butterfly graft
- C.** Extended butterfly graft
- D.** Batten grafts

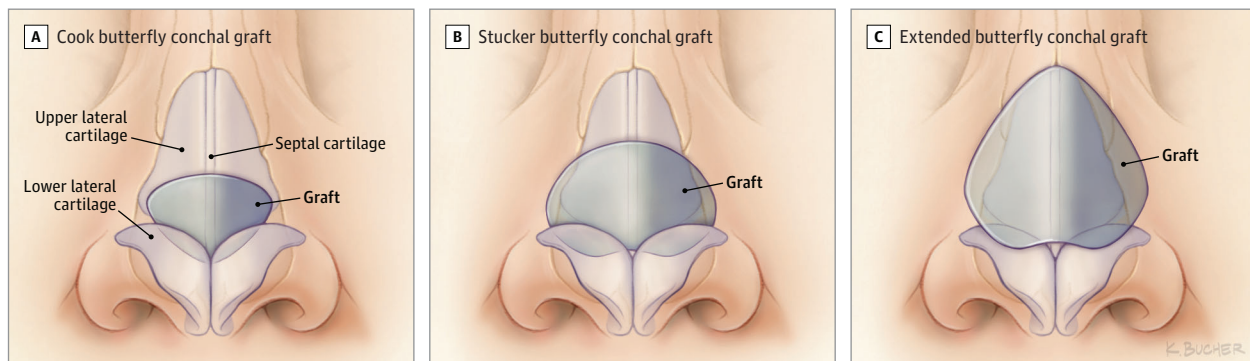


Figure 2. A, The Cook butterfly conchal graft overlaps the distal half of the upper lateral cartilage and rests under a small pocket created in the cephalic portion on the lower lateral cartilages. B, The Stucker butterfly conchal graft is a larger graft that completely covers the upper lateral cartilage and is rotated 180° relative to the Cook graft and also uses pockets under the lower lateral cartilage for stabilization. C, The extended butterfly graft allows for correction of both midvault collapse and a deficient bony pyramid, thereby correcting the upper two-thirds of the nose.

appearance. Harvest of an adequate graft ensures flexibility during sculpting to compensate for deficits in thickness in certain areas of the graft. In this case, a 4.0 × 3.5-cm initial graft was obtained, which was then trimmed to size to accommodate the cosmetic defect. Variations in thickness present near the helical root can be camouflaged during sculpting by placing this landmark as the vertical axis of the graft. Care is taken to ensure that adequate cartilage support is maintained at the donor site. We recommend preserving a minimum of 5 mm of cartilage along the antihelical fold, inferior crus, and crus helicus to ensure auricular contour, to preserve ear canal patency, and to avoid deformity.

The butterfly conchal graft described by Clark and Cook,² or the Cook butterfly graft, is appropriate for patients with mild saddling that does not involve the bony dorsum and where broadening of the supratip area is a concern.^{2,3} The Cook graft is an oval cartilage graft that overlaps the distal half of the upper lateral cartilage (ULC) and rests under a small pocket created in the cephalic portion on the LLC. The Stucker butterfly graft is a larger graft that fully covers the ULC and is rotated 180°.⁴ Similar to the Cook graft, the Stucker graft uses pockets under the LLCs for stabilization. It is a dynamic graft that is not secured to the bony dorsum. Therefore, it is better suited for moderate deficits that do not involve the bony pyramid. While the extended butterfly graft is an appealing option for many patients with severe saddle nose deformity, it may not be appropriate for all situations. In patients with severe bony deficits, significant skin contracture, foreshortened nose, or a saddle arising from oncologic resection with absent septum, costochondral rib grafting is a superior alternative that yields a better reconstructive result. Rib grafting is also preferable for patients

unaccepting of the limitations inherent in using auricular cartilage. The extended butterfly graft is appropriate for patients who do not desire a rib autogenous graft and who favor a less invasive approach or have objection to using cadaveric material.

The present case demonstrates how the extended butterfly graft can be used to achieve an adequate, durable reconstructive outcome even for fairly severe saddling. It is worth noting that some irregularities of the envelope can be expected due to the relatively thin skin over the dorsum that is frequently encountered in revision cases and due to the inherent irregularity of conchal cartilage. In the present case, limitations imposed by the technique included a moderate degree of residual saddle nose present with persistent tip overrotation and some widening over the nasal bones and rhinion apparent on frontal view (not shown).

The Cook, Stucker, and extended butterfly grafts can be seen as a continuum of techniques that address nasal saddling, depending on the severity of the defect (Figure 2). The butterfly graft is a versatile tool for nasal reconstruction.⁵ The extended butterfly approach, shown in Figure 1 preoperatively and 10 months after surgery, allows simultaneous correction of dorsal and tip deformities with restoration of function. Loyo and colleagues⁵ have recently described key modifications to the butterfly graft, including a longer and thinner graft that allows for effective treatment of nasal obstruction with acceptable visibility. The butterfly graft may also be used to correct internal nasal valve obstruction in primary rhinoplasty.⁶ Batten grafts cartilage grafts placed at the intervalve area to support the lateral nasal wall, but if used alone they are not adequate to address middle vault collapse.⁷

ARTICLE INFORMATION

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