A Free Auricular Composite Graft for Acquired Nasal Stenosis

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Abstract
Acquired nasal stenosis poses a reconstructive challenge for the facial plastic surgeon. Many surgical options are available, ranging from primary closure to skin grafts to free flap reconstruction for complex defects. Free auricular composite grafts represent a single-staged repair of nasal vestibular stenosis causing nasal obstruction. A thorough explanation of graft design and operative technique is provided in a patient with acquired nasal stenosis due to prolonged nasal tampon placement secondary to severe epistaxis and subsequent nasal vestibular infection. Free auricular composite grafts can produce desirable aesthetic and functional outcomes and should be considered in patients presenting with acquired nasal stenosis.

Introduction
There are various etiologies for nasal stenosis, most of which are acquired after infection, burns, or iatrogenic procedures. Congenital nasal stenosis is rare. Acquired stenosis is a result of loss of vestibular lining due to scar contracture or direct injury to the lobule-ala-columella complex. Nasal stenosis results in decreased efficiency in nasal breathing and loss of nasal symmetry.

The purpose of reconstruction is to restore the aesthetic and functional effects of the nostril. The contours of the lower nose contain convex and concave shapes in close proximity, creating a challenging canvas for reconstruction. Surgeons often select their method of reconstruction based on experience and known outcomes. Many surgical techniques have been used for nasal stenosis including stents, flaps and grafts. The common steps involve removal of the obstructing scar tissue, replacing it with new lining, and preventing restenosis. We present a case of acquired nasal stenosis with auricular composite graft reconstruction explaining the risks and benefits of the composite graft followed by a discussion of alternative options.

History
A 74-year-old female presented to the facial plastic surgery clinic complaining of a four-month history of left-sided nasal obstruction. Four months prior to the visit, she had experienced severe left-sided epistaxis necessitating nasal packing with a 7.5 anterior-posterior rhinorocket. It remained in place for five days. After successful removal of the packing, she developed severe intranasal crusting which was debrided and treated with numerous ointments and antibiotics. Cultures at that time grew Pseudomonas aeruginosa. She was otherwise healthy, without past medical, surgical, or family history. She was a previous smoker but quit 30 years prior. Examination demonstrated scarring and stenosis at the base of the left intranasal vestibule. There was no sign of intranasal infection on nasal endoscopy. The right nasal vestibule was widely patent. The patient was scheduled for an elective repair of the nasal vestibular stenosis.

Technique
In the operative suite under general anesthesia, the donor and recipient sites were infiltrated with 1% lidocaine with epinephrine. The surgical incision allowed full-thickness removal of the left vestibular sill scar. The defect was carefully measured and a composite auricular graft was harvested from the patient’s right conchal bowl. The composite graft consisted of full thickness anterior skin and cartilage. The donor site was then closed with 4-0 monocyrl sutures in a simple interrupted fashion. The composite graft was carefully trimmed to fit the defect. The graft was then inserted into the recipient site. The native nasal skin was reapproximated with the composite graft skin with 4-0 chromic suture in a simple interrupted fashion. Final closure camouflaged all incisions well. Complete repair of the defect was obtained from both functional and aesthetic viewpoints.

The patient returned for follow-up appointments at one week, one month, and three months postoperatively demonstrating 100% take of the graft with good color and viability. There was no evidence of necrosis and the patient reported marked improvement in nasal obstruction.

Discussion
Acquired nasal stenosis has an array of etiologies. Infection from a bacterial vestibulitis or herpes zoster virus is well documented. Iatrogenic causes include nasogastric tube placement, nasotracheal intubation, and cautery of nasal mucosa. Burns are another common etiology. Nasal stenosis results in decreased efficiency in nasal breathing as well as a loss of symmetric nostrils, affecting patient quality of life.

Repairing acquired nasal stenosis requires excision of the obstructing cicatrix, replacing the scar tissue with a new, healthy lining, and stenting the nostril to prevent re-stenosis. Often, surgery requires multilayer reconstruction, as skin, skeletal support, and nasal lining are excised to prevent re-stenosis. The reconstructive ladder includes healing by secondary intention, primary closure of simple defects, skin grafts, and local flaps. Auricular composite grafts include skin, subcutaneous tissue, and cartilage that are harvested en bloc. These grafts are elastic with a high degree of memory, have a good color and texture match to the nose, and contract minimally, reducing distortion and re-stenosis. The composite graft is harvested at the time of scar excision for a single stage repair and reconstruction.

Limitations of auricular composite grafts include an unpredictable survival of the graft. This technique should be avoided in patients who smoke, have a history of radiation to the area, systemic diseases, or other small vessel diseases such as diabetes. Infection and chondritis are rare complications.

Conclusions
Acquired nasal stenosis is a complex clinical entity. Addressing it requires a deep understanding of nasal anatomy. In select patients, an auricular composite graft is invaluable as it contracts minimally, provides critical structural support, and can be harvested for a single-stage procedure.

References