Complication of a Columellar Strut in an Edentulous Patient

Sanaz Harirchian MD, Kim P Murray MD, Jean Anderson Eloy MD, FACS

Introduction

The columellar strut is a well-established graft utilized for nasal tip support and refinement during rhinoplasty. Jack Anderson described his tripod concept of nasal tip dynamics in the 1960s. While the right and left lateral crura comprise two legs of the tripod, the conjoined medial crura functions as the third leg. The columellar strut was fashioned as a medial crural strut designed to improve columellar stability, nasal base and alar symmetry, and possibly improve tip support, projection, and even rotation. Anderson noted the potential usage of the columellar strut in adding support to the tripod and in reestablishing projection if the major tip support mechanisms had been violated. Complications of columellar strut placement are rare. There have been reports of clicking of the strut against the anterior nasal spine, however no other significant complications have been reported. We describe a rare and unreported complication of a columellar strut in an edentulous patient.

Case Report

A 43-year-old female with a past medical and surgical history significant for a wide local excision of a low grade mucoepidermoid carcinoma of the hard palate, presented with constant left sided nasal obstruction and external nasal deformity. She has worn upper dentures since her surgery in 2005. On anterior rhinoscopy, she had significant septal deviation to the left with moderate inferior turbinate hypertrophy bilaterally. Facial analysis was notable for mid and lower 1/3 nasal deviation to the right, a small dorsal hump, a flat wide bulbous tip, and a very short upper lip. Nasolabial angle was approximately 90 degrees.

The patient underwent a standard open rhinoplasty via transcolumellar and bilateral marginal incisions. Dorsal hump reduction, bilateral spreader grafts, cephalic trim leaving 7mm, and tip suturing were then performed. A 20 mm x 3 mm x 2 mm autologous septal cartilage graft was placed as a columellar strut (Figure 1). There were no immediate complications.

On the first follow up visit one week later, the patient complained of inability to wear her upper dentures due to a bump near the upper frenulum. Intraoral examination revealed a cartilaginous prominence into the upper gingival-labial sulcus (Figure 2). She was taken back to the OR one week later and an intraoral approach revealed that the cartilage was the posterior-inferior aspect of the columellar strut (Figure 3). The inferior portion of the cartilage was trimmed, the mucosa reapproximated, and the patient subsequently did well (Figures 4a,b).

Discussion

Jack Anderson’s tripod theory continues to be utilized in understanding nasal tip dynamics. In Anderson’s theory, the tripod is formed by the lateral crus of each lower lateral cartilage and the conjoined medial crura. Alterations in nasal tip projection, rotation, and support can be achieved by changes to the individual components of the tripod. The columellar strut has long been utilized to provide structural support for the lower lateral cartilages. Through buttressing the medial crura, the columellar strut is believed to provide structural integrity to the nasal tip. In addition, the columellar strut can correct medial crural asymmetries, refine the infratip columella-labule, provide a scaffold for tip sutures and grafts, and may increase nasal tip rotation and projection.

The columellar strut is usually designed from autogenous septal cartilage, although cadaveric costal cartilage and auricular cartilage is also utilized. The strut is typically 20-25 mm in length and 2-4 mm in width. It is inserted in a recipient pocket between the alar cartilages, and sutured between the medial and middle crura. Rohrich advocates using the longer fixed strut when 3 mm of more of tip projection is needed, versus the floating strut when 1-2 mm of tip projection is needed.

In our patient, the combination of specific patient characteristics, anatomic factors, and operative technique all contributed to the etiology of this complication. The patient’s previous history of wide local excision of the hard palate with subsequent need for upper dentures placed her at risk for having difficulty related to denture placement. Additionally, the patient’s very short upper lip decreased the amount of space between the columellar strut and the gingival-labial sulcus. Lastly, the creation of a 20mm long columellar strut may have been unnecessarily long. A range of 20-25 mm in length has been described, while some authors advocate extension of the strut onto the premaxilla, others avoid this in order to prevent post-operative clicking of the strut.

Conclusion

Clearly, a columellar strut can have significant benefits to improvement of nasal base symmetry and stability. Routine usage probably can be justified by this alone. Sculpting the graft properly, especially with respect to its length, can dramatically limit the few known associated risks. Our report of this unique complication should give surgeons additional caution when sculpting columellar grafts in order to avoid potential post-operative complications in edentulous patients.

References