
How I Do It:
A Targeted Problem and Its Solution

Direct Tissue Expansion of the Contracted Nose

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INTRODUCTION

Newman, in 1957, was the first to describe the use of inflatable balloons to allow for the expansion of cutaneous tissue for closure of skin defects.¹ Since that time, tissue expansion has been used in many areas of the body, including the face. It provides for closure of defects that would not be amenable to primary closure or where significant donor site morbidity would be created from flap reconstruction. Tissue expansion offers several unique advantages as compared with other reconstructive modalities. It results in skin of similar color, thickness, and hair-bearing characteristics. In addition, sensation is maintained. Tissue expansion may be repeated several times in the same location to provide for additional coverage if this is required.^{1,2}

Tissue expansion does have risks, including implant related problems of extrusion, exposure, and rupture and patient related issues of wound breakdown, infection, hematomas, and cutaneous necrosis. In addition, there is a significant period of prolonged visible deformity during the expansion phase, especially when used in the head and neck. Within the head and neck, tissue expanders have been used in nasal reconstruction, scalp expansion for hair replacement, eyelid expansion, and cheek and neck expansion for repair of defects of the neck and lower two thirds of the face.¹⁻⁴

There have been several previously reported techniques for tissue expansion in nasal reconstruction. They

all involve tissue expansion of the forehead skin to allow for flap reconstruction of the nose from a forehead donor site.^{2,4-6} The paramedian forehead flap represents an excellent, reliable donor site to provide for cutaneous coverage of a multitude of nasal defects. This is a useful technique for patients undergoing initial or secondary reconstruction. This flap relies on blood supply from the supratrochlear arteries. However, when the forehead vasculature has been compromised, most commonly as a result of previous surgery, alternative procedures must be sought. In this article, we outline our technique for direct tissue expansion of the nasal skin in the flap-depleted patient using an illustrative case example.

TECHNIQUE

A 68-year-old white male presented with a complaint of persistent progressive nasal airway obstruction as well as significant concerns regarding appearance. Specifically, he was concerned with his low dorsal profile and desired a "stronger nasal profile" (Figs. 1 and 2). He had a history of having undergone resection of numerous cutaneous carcinomas of the nose, the last of which was removed approximately 10 years before initial presentation. The reconstruction, performed elsewhere, included glabellar flaps, bilateral nasolabial flaps, and several local nasal flaps. The patient was noted to have severe contraction of the soft tissue envelope of the nose. We felt that dorsal augmentation would be limited and likely not possible to any significant degree as a result of the limitation posed by the overlying skin. The goal was to mobilize an increased surface area of nasal skin coverage to allow for underlying graft placement. In addition, we did not want significant tension transmitted onto the rib graft because this may result in resorption. After reviewing the treatment options with the patient and obtaining fully informed consent, we opted for direct tissue expansion of the patient's nasal skin envelope. The patient was taken to the operating room for initial expander insertion. An incision was made through a previous glabellar incision and carried down through the subcutaneous tissue. A nasal skin flap was elevated over the osseocartilaginous dorsal remnant in a plane immediately superficial to the bone and cartilage. A suprapericranial plane was then used to dissect vertically to the mid forehead. A 4 cm × 1 cm digital implant was then placed into the pocket after verifying implant integrity and

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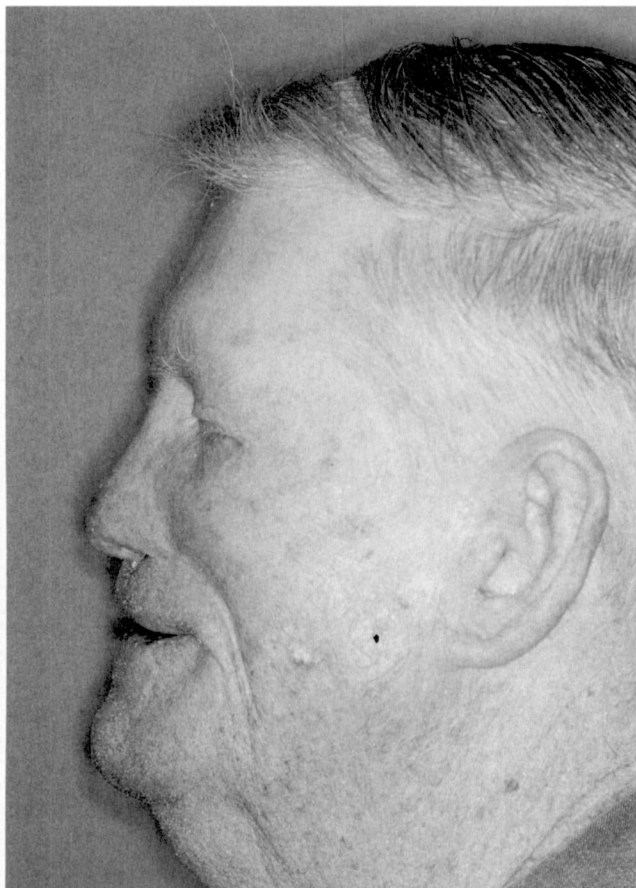


Fig. 1. Lateral view (preoperative) of patient in case example.

soaking it in a clindamycin solution (Figs. 3 and 4). The injection port was inserted suprapericranially at the level of the mid forehead. Initially, 0.75 mL of sterile water was injected through the port into the tissue expander overlying the dorsum to obliterate the dead space that had been created with dissection. The patient was seen every 1 to 2 weeks for the next 2 months, and the tissue expander was filled with sterile water to a total volume of 6.0 mL.

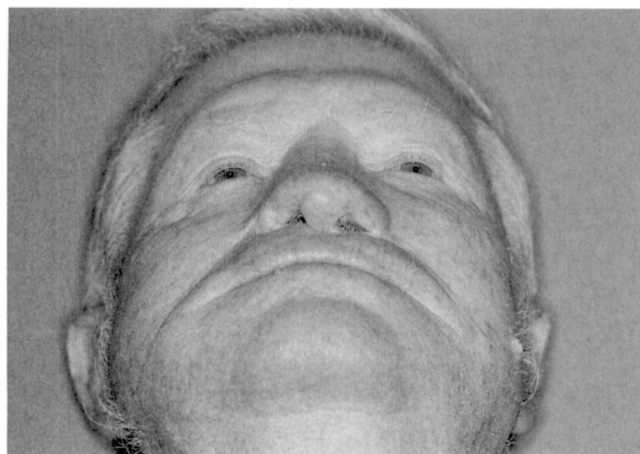


Fig. 2. Basal view (preoperative). Note contraction of soft tissue envelope of nose secondary to multiple previous surgeries.

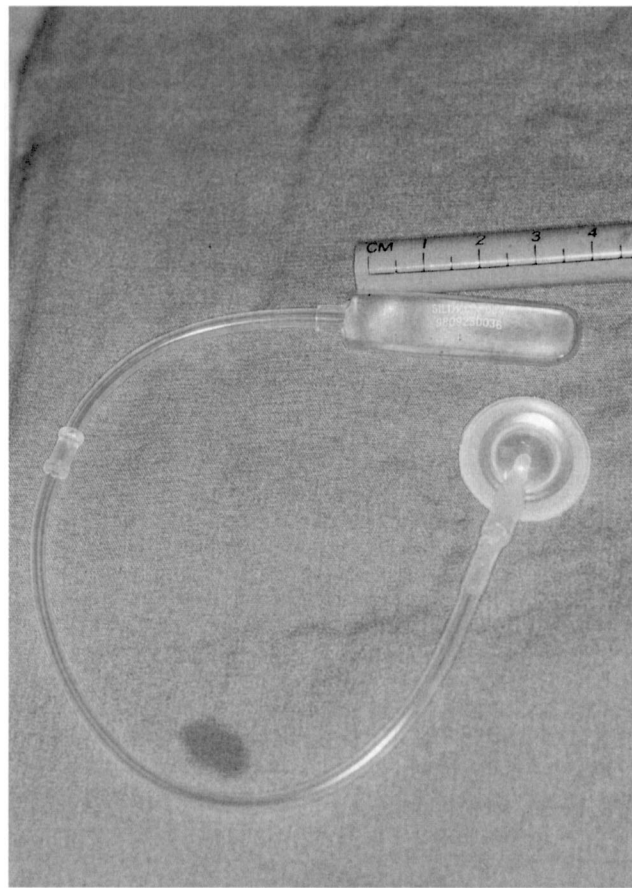


Fig. 3. Digital 4 cm \times 1 cm tissue expander connected to injection port before insertion.

The patient was then taken back to the operating room for implant removal and replacement with a rib graft fixated to the underlying dorsum. There were no problems with infection, extrusion, or cutaneous necrosis noted. The expansion process was well tolerated. The patient experienced significant improvement in his long-standing nasal airway obstruction by opening the internal valve through dorsal augmentation. Esthetically, the patient was quite happy with the improvement in dorsal height that had been achieved (Fig. 5). Further refinement of the nasal tip is limited by the patient not wishing to pursue this option as well as by issues regarding vascularity in this region (the patient had undergone columella flaps and reconstruction of the lower one third of nose with separate flaps previously). The patient has experienced no untoward effects related to implant placement or subsequent reconstruction and is quite pleased with the result.

DISCUSSION

Although tissue expanders have been described for many uses in head and neck reconstruction, to our knowledge, there are no previous reports of direct nasal skin expansion using this technique. Local tissue expansion offers several advantages, not the least of which is allowing for an excellent skin color and texture match. Although expansion of dorsal nasal tissue may not be an option in every case, in this case, the patient had already received other flaps that we would have considered as alternatives for nasal reconstruction. A novel approach



Fig. 4. Intraoperative photograph demonstrating insertion of tissue expander by way of an old glabellar incision.

was used because the underlying blood supply for more conventional flaps could not be reliably defined or was compromised because of the patient's previous operations. As with any tissue expansion of the head and neck, complications are possible. The most often seen, in approximately 30% of head and neck tissue expanders, is erosion of the overlying tissue and exposure of the implant.¹ This more frequently occurs in cases where the expander is placed superficially, causing erosion of the overlying skin. This is why we felt it important to place the tissue expander just over the bone and beneath all of the subcutaneous tissue. The patient's favorable esthetic outcome and improvement of symptoms demonstrates that tissue expansion of the nasal dorsum is a viable alternative for nasal tissue reconstruction. The implant is available from a number of manufacturers because it is used commonly in digital reconstruction.

CONCLUSION

Direct tissue expansion of the nasal skin appears to represent a viable option in the occasional flap-depleted

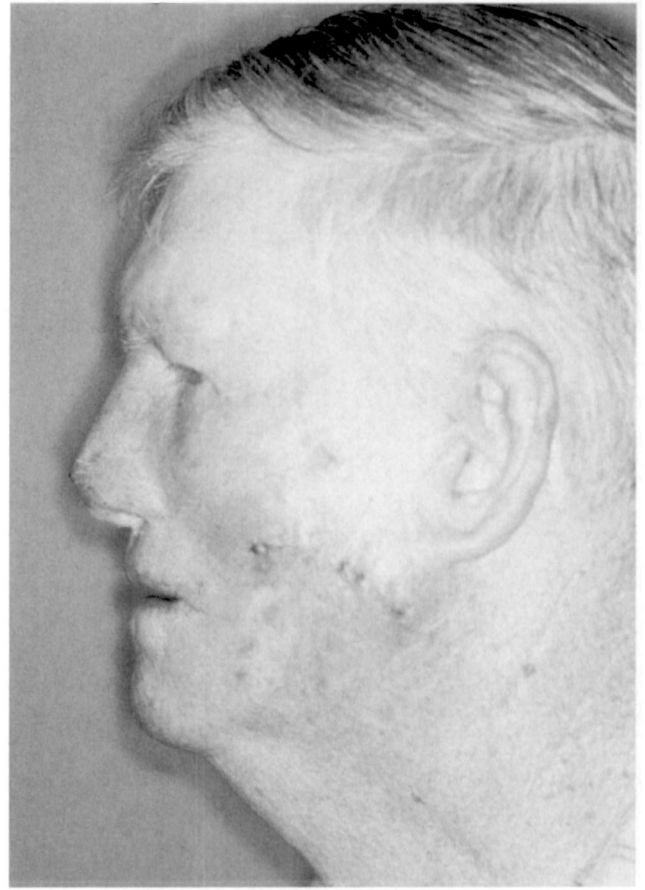


Fig. 5. Postoperative lateral view after removal of expander and replacement with a rib graft. Secondary tip work is required but has been deferred for fear of devascularizing this region.

patient seeking reconstruction. It is well tolerated by the patient, simple to perform, and appears to be associated with favorable outcomes in selected patients.

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