How to Address Scar Pincushioning and Webbing of the Nasal Dorsum Using Surgical Defatting and Z-plasty

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Nonmelanoma skin cancer is the most common cancer, typically growing in sun-exposed areas, such as the nose. After complete excision of the tumor, the subsequent scar may exhibit multiple complications that are easily noticeable and cosmetically unsatisfactory. When performing a revision of such a scar, using a single surgical technique may be insufficient; rather, the surgeon may need to carefully plan and utilize several techniques to achieve the best cosmetic outcome. Here, we report a case that demonstrates successful use of surgical defatting and Z-plasty techniques to revise a scar of the nasal dorsum that exhibited pincushioning and webbing.

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Practice Gap

Nonmelanoma skin cancer is the most common cancer, typically growing in sun-exposed areas. As such, the nasal area is a common site of onset, constituting approximately 25% of cases. Surgical excision of these cancers generally has a high cure rate.[1]

Although complete excision of the tumor is the primary goal of the dermatologic surgeon, achieving a cosmetically satisfactory scar also is important. As a prominent feature of the face, any irregularities to the nose are easily noticeable.[2] The subsequent scar may exhibit features that are less than ideal and cause notable stress to the patient.

When a scar presents with several complications, using a single surgical technique may not sufficiently address all defects. As a result, it can be challenging for the surgeon to decide which combination of methods among the myriad of nonsurgical and surgical options for scar revision will produce the best cosmetic outcome.

Case and Technique

A 76-year-old man presented 1 year after he underwent Mohs micrographic surgery for squamous cell carcinoma on the nasal dorsum. The tumor cleared after 1 stage and was repaired using a bilateral V-Y advancement flap. Postoperatively, the patient developed pincushioning of the flap, atrophic scarring inferior to the flap, and webbing of the pivotal restraint point at the nasal root (Figures 1A and 1B). We opted to address the pincushioning and nasal root webbing by defatting the flap and performing Z-plasty, respectively.

Pincushioning—Pincushioning of a flap arises due to contraction and lymphedema at the edge of the repair. It is seen more often in nasal repairs due to the limited availability of surrounding skin and changes in skin texture from rhinion to tip.[3] To combat this in our patient, an incision was made around the site of the original flap, surrounding tissue was undermined, and the flap was reflected back. Subcutaneous tissue was removed with scissors. The flap was then laid back into the defect, and the subcutaneous tissue and dermis were closed with interrupted buried vertical mattress sutures. The epidermis was closed in a simple running fashion.

FIGURE 1. A and B, Primary scar following bilateral V-Y advancement showing pincushioning, atrophic scarring, and webbing. C, Scar 4 months after surgical defatting and Z-plasty.

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Webbing—Webbing of a scar also may develop from the contractile wound-healing process.[4] Z-plasty commonly is used to camouflage a linear or contracted scar, increase skin availability in an area, or alter scar direction to better align with skin-tension lines.[5,6] In our patient, we incised the webbing of the nasal root along the vertical scar. Two arms were drawn at each end of the scar at a 60° angle (Figure 2); the side arms were drawn equal in length and incised vertically. Full-thickness skin flaps were then undermined at the level of subcutaneous fat, creating 2 triangular flaps. Adequate undermining of the surrounding subcutaneous tissue was performed to achieve proper mobilization of the flaps, which allowed for flap transposition to occur without tension and therefore for proper redirection of the scar.[6] The flaps were secured using buried vertical mattress sutures and simple running sutures. Using too many buried interrupted sutures can cause vascular compromise of the fragile tips of the *Z* and should be avoided.[3]

At 4-month postoperative follow-up, the cosmetic outcome was judged satisfactory (Figure 1C).

Practice Implications

In our patient, pincushioning of the flap was easily addressed by defatting the area. However, doing just this would not have sufficed and necessitated another surgical technique—the Z-plasty—which needed to be designed carefully. The larger the angle between the side arms and central limb, the greater directional change and scar length that is gained (Figure 3). As a result, longer limbs and a greater angle could advantageously break up the scar line but consequently would lengthen the scar considerably. Therefore, if the scar was longer or the skin was inelastic, multiple Z-plasty procedures may have been preferred.

Additionally, for each central limb, both mirror-image options for peripheral arms were considered, with the optimal choice being the one that allowed for final scar lines to mimic relaxed skin-tension lines. Accuracy of the incisions was critical and was assessed by drawing a line between the free ends of the lateral limbs of the *Z*; this line should pass perpendicularly through the midpoint of the central limb. Last, as with other transposition flap options, Z-plasty has the potential to create a trapdoor or pincushion effect; we reduced this risk by wide undermining to establish an even contraction plate.[6]

When planning the revision, we considered multiple approaches to achieve the best aesthetic outcome in 1 stage. Had there been notable depression in the scar, we may have used a full-thickness skin graft. If the skin surface was lumpy and uneven, dermabrasion or a laser may have been utilized. Another consideration was to avoid using intralesional steroids, which could have made the already atrophied portions of the scar worse.

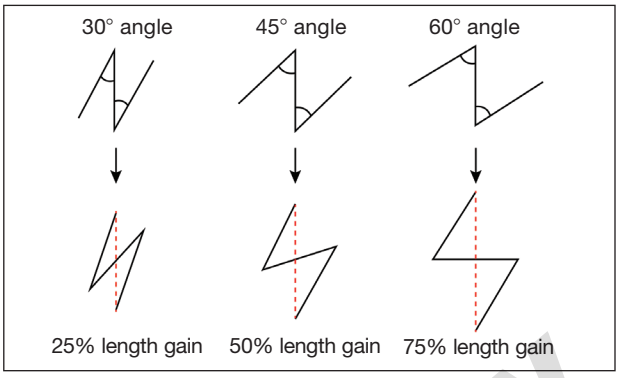

FIGURE 3. Variations of Z-plasty using different angles and their subsequent change in scar length and orientation of the central limb.

Overall, the surgical plan that we chose took into consideration the patient's nasal anatomic structure, the combination of scar defects, the patient's desires, and the tools available.

Final Thoughts

The ideal scar is inconspicuous, does not impair the function of surrounding structures, and blends well with adjacent skin.[5] Consequently, the combination of pincushioning and webbing of a scar, especially in the nasal area, can pose a surgical challenge to the surgeon and can cause severe anxiety in the patient. In those circumstances, a single surgical technique is not likely to produce the revision with the best cosmetic outcome. Therefore, the synergy of 2 or more surgical techniques with proper planning and meticulous selection may be necessary. A broad knowledge of various scar revision techniques increases the surgeon's capability to create the ideal scar.

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FIGURE 2. Preoperative drawing of Z-plasty with a 60° angle.

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