

ASSESSMENT OF AMPLIFIED V-Y FLAPS FOR NASAL DEFECT RECONSTRUCTION

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Abstract

The skin of the nose is relatively adherent to the underlying structures secondary to deficient subcutaneous tissues. This may interfere with local flap recruitment, as in the nasal tip, and thus it is difficult to utilize traditional V-Y flaps to close large nasal defects. The addition of an amplified limb as a transposition flap onto the advancing edge of the V-Y flap is considered. This limb is utilized from the remaining nasal skin adjacent to the defect being reconstructed and is attached to the end of the V-Y flap after its advancement to close the remaining defect. The objective is to assess the use of amplified V-Y flap in closure of relatively large nasal defects incorporating nasal tissue itself on one session.

Nasal defects as large as 3.2 cm have been closed with this flap following excision of skin tumors on the nose in 14 patients over 40 years old.

Most of the patients were satisfied with aesthetic end results, except in two patients with only trivial complications. There was partial necrosis at the tip of the amplified portion of the flap in the nasal dorsum and sidewall regions. Other patients were concerned about dog ears at the base of the transposed flaps that settled later on spontaneously.

Conclusion and recommendation: It is advisable to use the amplified V-Y flap in reconstruction of relatively large nasal defects as one stage procedure with expected good aesthetic outcome.

Nasal skin is difficult to match in color, texture and thickness. It is therefore desirable to repair nasal defects with nasal skin. Since nasal skin is relatively inelastic, it takes a relatively large nasal skin flap to reconstruct a small defect¹. Owing to the unique anatomical arrangement of the nose, careful planning is especially important when operating in nasal region. For patients with large defects involving the nose, a simple local flap cannot be used for reconstruction. Consequently, it is difficult to achieve a good aesthetic outcome with adequate contrast and inconspicuous scars at the borders of aesthetic subunits²

Amplified V-Y Flaps For Nasal Defect Reconstruction: Park on 1998⁴, described this flap for closure of up to 2.5 cm defect on the nose. The addition of an amplified limb as a transposition flap onto the advancing edge of the V-Y flap is considered. This limb is utilized from the

remaining nasal skin adjacent to the defect being reconstructed and is attached to the end of the V-Y flap after its advancement to close the remaining defect. In this study, we applied this technique to reconstruct nasal defects resulting after resection of skin tumors.

Patients and methods

This is a cross sectional study conducted in Baghdad Medical City (Al-Shaheed Gazi Al-Hariri hospital) from January 2010 to May 2011. Fourteen patients were included all of them complained from suspected B.C.C. lesions of the nose, which were removed surgically and the defect was closed by using amplified V-Y flaps. History and general examination focused on co-morbidities that might interfere with general anesthesia and preoperative routine investigations also done. Patients or their families have been

told about the procedure and other alternatives like skin grafting preoperatively. Photographs were taken pre, intra and postoperatively.

Design: The length of advanced part of the amplified V-Y flap should be similar to the traditional V-Y flap, while its width should be greater than that of the defect owing to the presence of an amplified limb of the flap along the sides of the defect. The amount of width of this amplification is affected by the degree of mobility of the V-Y flap and adjacent tissue laxity. The bilateral amplified limb in an amplified V-Y flap should be equal to half the width of the defect (Figure 1). The unilateral amplified limb in an amplified V-Y flap should be equal to the width of the defect. It can be located on either side of the defect according to its anatomic location on the nose (Figure 2).

Surgical technique: Owing to their risk factors, most of the patients were operated on under local anesthesia, using lidocaine 1% with epinephrine 1:200,000 together with mild sedation. General anesthesia was adopted in two patients. Before injection of local anesthesia, methylene blue was used for demarcation of the lesion, its safety margin and for flap design. After the lesion has been excised with 2-5 mm safe margin, circular or oval defects will result with sizes of the greatest diameter of these defects are shown in table I. The long axis of the flap

is designed to be in the direction of the relaxed skin tension line of the area being reconstructed. Closure with the least tension is exercised when it is in doubt as on the tip of the nose. The flap is designed with unilateral or bilateral amplified limbs according to the anatomical location of the resulting defect (Figure 1&2). Incision is carried out down to the level of subcutaneous tissue, and dissection using blunt scissors is initiated as spreading technique alongside the V-Y flap and at its tip to release it from the adjacent tissues without undermining beneath the flap, except at the leading edge when it is needed. Dissection is continued until the V-Y flap moves freely into the defect with minimal tension. At this stage, the amplified limb of the flap is released by cutting or stretching, the V-Y flap is advanced to close the proximal part of the defect and finally the amplified portion of the flap is transposed and fixed at its base to close the remaining distal part. Wound is closed in layers using dermal 5-0 Polygalactin 910 (Vicryl ®) sutures at the advancing edge and alongside the V to Y flap, and 6-0 Polypropylene (Prolene®) sutures for the skin closure. Dressing is then applied. Parenteral antibiotics were started and changed into oral and topical antibiotics on the second postoperative day and continued till removal of the stitches, on the fifth postoperative day. The patients were seen after three weeks to ten months duration for assessment of the wound healing and flap contour.

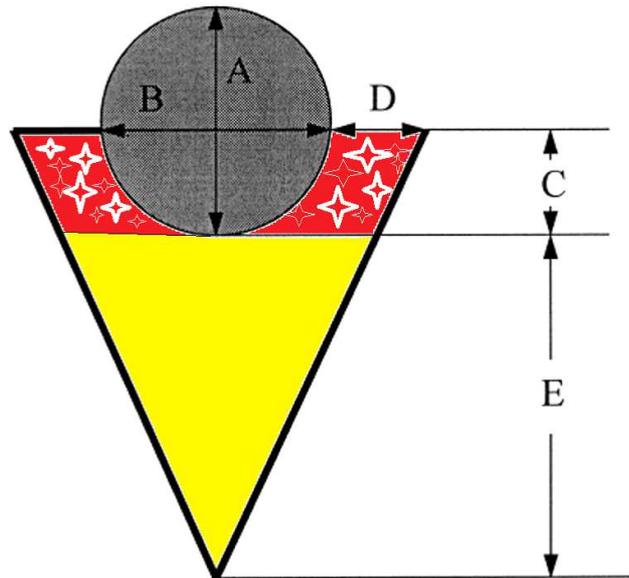


Figure 1: Design of the bilateral amplified V-Y flap. A longitudinal diameter of the defect; B transverse diameter of the defect; C length of the amplified portion $C=1/2$ of B; D width of amplified portion depends on the size of the defect and mobility of tissues; E length of the main portion $(11/2-2) * A$ (From D.H.Park. Amplified V-Y Flap for Nasal Defects. Eur.J.Plastic Surgery 1998;21:132-133.)

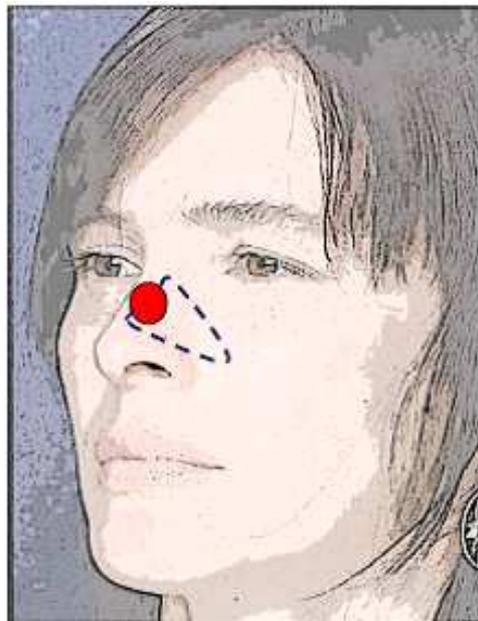


Figure 2: Design of the amplified V-Y flap. This diagram depicts the nasal dorsum defect and bilateral amplification of V-Y flap (From Fabio Meneghini. Clinical Facial Analysis. Elements Principles Techniques. Springer-Verlag. 2005;3:23-26)



Figure 3: A 40 years old male with suspected basal cell carcinoma on the dorsum of the nose that have been treated previously with curette. a-d planned excision and bilateral amplified V-Y flap repair. e-f closure of the flap. g-h appearance at 3 and 6 months after the operation. Note no significant distortion of the nose. SIZE: BEFORE EXCISION: 22x18 mm, AFTER EXCISION: 32x30 mm

Results

Fourteen patients were subjected to this procedure, their ages ranged from 40 to 78 years and duration interval of presentation

was 1 to 10 years. Total number of males was 9 while that of females was 5 patients. Of these patients, 9 defects were

repaired utilizing bilateral amplified flap technique and the others by unilateral amplification. The resulting circular or oval shape defects were of various sizes with the greatest diameter is shown in the (table-I). Using bilateral amplified flap, defect size up to 3.2cm in the greatest diameter was closed successfully in one session without significantly distorting anatomical landmarks of adjacent structures, and with acceptable aesthetic end result to the patient. In only two of these patients, complications in form of

wound dehiscence secondary to partial necrosis at the tip of the transposed flap have been noticed, one on the dorsum and the other on sidewall region. Both patients were treated conservatively, and the wound healed successfully. Dog ear at the base of amplified portion of the flap were also noticed in most of the patients, which settled spontaneously and none of the patients underwent revision surgery. Table -II correlates the results mentioned above in regard to different anatomical sites on the nose presented in this study.

Table I: Distribution of cases according to size of the resulting defect after nasal tumor excision.

<i>No. of cases</i>	<i>Size of the defect</i>
9	Up to 2 cm
3	2cm -2.5 cm
2	>2.5 cm -3.2 cm

Table II: Distribution of cases according to anatomical site of the tumor on the nose, type of amplified flap used and resting complications of the procedure.

<i>No. of cases</i>	<i>Anatomical site of the nose</i>	<i>Unilateral amplified flap</i>	<i>Bilateral amplified flap</i>	<i>complications</i>	
				<i>Partial flap necrosis</i>	<i>Dog ears</i>
6	<i>Dorsum</i>	--	6	1	5
5	<i>Sidewall</i>	2	3	1	4
2	<i>Ala</i>	2	--	--	1
1	<i>Tip</i>	1	--	--	1

Discussion

The degree of mobility of the V-Y flap is depended on the laxity of the underlying subcutaneous tissue. In the nasal area which is characterized by a paucity of subcutaneous tissue, the mobility of the V-Y flap is less, resulting in considerable tension when a conventional V-Y flap is used and many defects in nasal areas are too large for a single V-Y flap. Defects up to 3.2cm were closed successfully by using amplified V-Y advancement flap (table I). In 1998 Park⁴ advocated the use of amplified V-Y flaps for reconstruction

of nasal defects in 11 patients with different nasal areas, especially the nasal tip, while in our study it was the dorsum and sidewall of the nose to be mostly reconstructed. Park also noticed that the complication as partial tip necrosis of the flap was in the tip region of the nose while in our study these complications were encountered in the dorsum and the sidewall regions. This may be related to the difference in site distribution of the lesions or due to the size of the resulting defects. In very similar design on 1992,

Pribaz et al⁵. described the extended V-Y technique. They utilized this procedure in reconstruction of nasal area and other regions like the forehead in 18 patients. The only complications that have been noticed were partial tip necrosis of the flap and dog ears at the base of the transposed flap. The principle of the V flap, amplified sliding flap, and the slide-swing flap relies on both advancement and transposition principles. The triangular limb of amplified V-Y flaps have increased vascular risks in the apical areas of the two distal flaps where the perfusion is more critical. To overcome these shortcomings they modified the shape of the amplified V-Y flap with a quadrilateral amplification along both sides of the flaps⁴. Rishu and Hiko³ have described Pacman flap, its design is almost the same as a conventional V-Y flap. Instead of cutting off the two triangular parts of the V flap, those two parts are rotated and advanced to meet at the center of the defect. Sliding

subcutaneous pedicle flaps have been designed as V-Y flaps by Trevaskis et al⁶. They advised the use of double or triple V-Y flaps for closure of a circular defect in the face with good colormatch and texture but implication of this technique in the nose with a large defect may disturb the anatomical landmark significantly. Takatoshi et al² described a technique that uses a combination of local flaps to reconstruct large defects involving the nasal dorsum and cheek. However, this technique disturbed the adjacent aesthetic subunits and complicated with ectropion after the operation.

Conclusions and recommendations

It is advisable to use the amplified V-Y flap in reconstruction of relatively large nasal defects with expected good aesthetic outcome.

It is one stage procedure, and no revision surgery will be needed later on. No significant disturbance of the nasal structure resulted at the end of the procedure.

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