ORIGINAL ARTICLE

Reliability of Zitelli's bilobed flap for coverage of small partial thickness defects of the lower third of the nose

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Abstract

Objectives: To define the use and place of Zitelli's bilobed flap for reconstruction of small partial thickness defects of the lower third of the nose.

Design of study: Descriptive case series

Study duration & Setting: Burns & Plastic Surgery Centre, Hayatabad Medical Complex, Peshawar, Pakistan from January 2016 to March 2019.

Material and Methods: This descriptive case series study was conducted on 33 patients. Ethical approval was sought and written informed consent was obtained. Detailed history and clinical examination was carried out. Age, gender, site and size of defects were all documented. Inclusion criteria were defects located on distal third of the nose, size < 2cm, no scarring in surrounding nose and non smokers. Photographs were taken. Patients were followed regularly on 5th day for suture removal and then at 3, 6 and 12 months for any complication or recurrence.

Results: A total number of 33-patients including 21-male and 12-female were enrolled in the study. Their ages ranged from 23 to 65 years with an average age of 40 years. Causes of defect were basal cell carcinoma in 16 cases, squamous cell carcinoma in 6 cases, pigmented hairy nevi in 4 cases, actinic keratosis in 4 cases and acanthoma in 3 cases. In 13 cases, defects were located on the nasal tip and in 11 cases, defects were located on supra tip area. Nasal alar defects were present in 9 cases. The average size of the defect reconstructed with bilobed flap was 1.7 cm (range 0.5-2.0 cm). The total angle of transferred tissue ranged from 45 to 165 degrees with an average angle of 105 degree. The resultant scars were imperceptible and the color and texture match, contour and symmetry were reasonably good. Post-operative courses were uneventful except in 3 cases that resulted in contour deformities (2 cases) and erythema of scar (1 case).

Conclusion: Zitelli's bilobed flap is a versatile and reliable flap. Its implementation is very easy when selection of patient and wound is carefully done and the principles of technique followed.

Keywords: Nasal defects, reconstruction, Zitelli's bilobed flap, transposition flap

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Introduction:

Cosmetic and functional reconstruction of nasal defects has always been a challenge for plastic surgeon. Nasal defects are either simple or complex and results mainly from trauma or skin tumor excision.[1,2] Numerous options of reconstruction exist for these nasal defects ranging from primary closure and skin grafts to local or regional flaps.[3,4] Some of the flaps used for these defects reconstruction are nasolabial flaps, forehead flaps, dorsal nasal flaps, bilobed flaps and cheek flaps.[4] Flap selection and timing of reconstruction depends mainly on nature of lesion, location and type of defect.[5] Defects that are situated on the distal nasal tip and alar lobule need special consideration.[6]

Table 1: *Patient characteristics*

Characteristics	Male	Female
Patient		
Number	21	12
Age (mean, range)	40 (23–65)	44 (33–70)
Lesion		
Basal cell carcinoma	9	7
Squamous cell carcinoma	4	2
Pigmented hairy nevi	1	3
Actinic keratosis	4	-
Acanthoma	1	2
Location (subunit)		
Nasal tip	10	3
Supra-tip	4	7
Alar lobule	5	4
Defect size (cm2)		
<0.5	1	43.0
0.51–1.00	20	57.0
1.01–1.50	9	3.0

In 1918, Esser first described the bilobed flap for nasal reconstruction which later on modified by Zitelli in 1989.[7,8] It is one of the most reliable options for reconstruction of skin and soft tissue defects of nasal tip, supratip and ala measuring between 0.5 and 1.5cm.[8,9] The bilobed flap allows transposition of skin over a greater area and arc of rotation to rotate into the defect thus using local tissue of the same color and texture for reconstruction.[5,10] It has got aesthetically pleasing scar appearance and minimization of dog-ear formation with the additional benefit of closing the secondary defect primarily.[5, 9]

Materials and Methods:

This descriptive case series study was conducted on 33-patients at Burns & Plastic Surgery Centre, Hayatabad Medical Complex Peshawar, Pakistan from January 2016 to March 2019. Ethical approval was sought from Institutional ethical review board and written informed consent was obtained from all patients. Patients were admitted as day case and detailed history and clinical examination was carried out. All characteristics such as age and gender of the patient, cause, site and size of defects, surgical management and follow-up period were all documented. Inclusion criteria were partial thickness defects located on distal third of the nose, size < 2cm, no scarring in surrounding nose and non smokers. Exclusion criteria were cases with previous surgeries on the nose, defect size >2 cm in diameter and full thickness, or defects located in the upper two third of the nose.

In all cases, photographs were taken in the pre operative, intra-operative and post-operative period. Patients were followed regularly on 5 day for suture removal and then at 3, 6 and 12 months for any complication or recurrence.

All the procedures were performed under local anesthesia using xylocaine 2% and adrenaline in 1: 200,000 concentrations. Flaps marking were done with a surgical skin marker and flap was designed such that it is based medially or laterally depending on the site of the defect. The two lobes of the bilobed were designed on a single pedicle in a manner that diameter of the first flap was equal to the defect size and diameter of the second flap was ½ of the size of the first flap. The angle between the defect and second flap was 90 degree and the first flap was formed at an angle range of 45-55 to the defect. Skin incision was given and defect created such that a burrow triangle was excised to make the defect triangular form the round one. The flaps were widely undermined upto the sub-muscular and peri-chondrial levels for adequate tissue perfusion and transposition to the desired locations. After securing hemostasis, sub dermal sutures with vicryl 5/0 were placed and skin closure was done with prolene 5/0 in interrupted fashion. Post-operatively, patients were advised to use topical Polymyxin B for one week.

Results:

A total number of 33-patients including 21(63.63%) male and 12 (36.36%) female were enrolled in the study. Their ages ranged from 23 to 65 years with an average age of 40 years. Causes of defect were basal cell carcinoma in 16 cases (49%), squamous cell carcinoma in 6 cases (18%), pigmented hairy nevi in 4 cases (12%), actinic keratosis in 4 cases (12%) and acanthoma in 3 cases (9%) as shown in table-I. In all cases, the resultant nasal defect was not full

Table 2: *Distribution of nasal subunit and defect area size (cm2)*

Variables	<0.5	0.51–1.00	1.01– 1.50	1.51–2.0
Subunit				
Tip	0	10	2	2
Supratip	1	7	6	1
Alar	0	3	1	0

Figure1. Small squamous cell carcinoma on nasal supratip in a 37- years old female Excision with 0.5 cm margin & reconstruction with laterally based Zitelli's bilobed flap

thickness and was < 2 cm in greater diameter. In 13 cases (40%), defects were located on the nasal tip and in 11 cases (33.33%), defects were located on supra tip area. Alar lobules defects were present in 9 cases (27.27%).

The average size of the defect reconstructed with bilobed flap was 1.7 cm (range 0.5-2.0 cm) and involved just skin and muscle plane. The angle of tissue transfer, any distortion or dog ear formation and final cosmetic appearance were studied.

The angle between the closed second flap donor area and the reconstructed defect was considered as the total angle of transferred tissue. This angle ranged from 45 to 165° with an average of 105°. There were minimal distortion of tissues and less incidence of dog ear formation. The resultant scars were imperceptible and the color and texture match, contour and symmetry were reasonably good.

Post-operative courses were uneventful except in 3 cases (9%) where poor judgment and poor flap design resulted in contour deformities (2 cases) and erythema of scar (1 case). Our results are given in the following tables and figures.

Discussion:

Partial-thickness defects of the distal third of the nose can be reconstructed by many techniques.[3,4] These techniques have been practiced and modified multiple times in reconstructing defects of nasal tip and ala. All options of reconstructive ladder starting from primary closure to skin grafts and regional or local flaps like forehead, naso-labial and bilobed flaps have been used by many surgeons.[4,5] Free skin grafts have been used for covering these defects but it will not replace the defect and the cosmetic outcome is also very poor.[6,11] Recently, the bilobed flaps have got the greatest application in reconstructing defects of the distal third of the nose. Its first application in nasal tip defect reconstruction has been described by Esser in 1918.[7] By using the principles of transposition flaps, Esser uses the double transposed flaps at right angle to each other with an overall rotation of 180°. This design did not gain much popularity because this flap design have resulted several complications like alar asymmetry in many patients. To overcome these problems, Zimany in 1953 had made few changes in the basic design of bilobed flaps hence he was able in achieving good cosmesis.[12]

The final modification to the design of bilobed flaps was made by Zitelli in 1989 for reconstructing small defects located on the nasal tip and alar lobules.[8] In his modified design, Zitelli used two adjacent skin flaps based on single pedicle but with an angle of 45° to 55° to each other thus getting a total rotation of 90° to 110°.[8,13] The first lobe was equal or 10% larger to the defect and it was transposed into the defect, and the second flap was fashioned often in an elliptical shape and was ½ the size of the first flap and then was transposed into the secondary defect created by the first flap transposition.[3,8,13] Zoumalan et al, in

their study have found that distortion of alar rim can be avoided in bilobed flaps if the secondary defect closed in a vertical fashion.[14] Type of defect and nature of wound greatly influence the timing of reconstruction and the way the flap is used.[5,15,16]

Nose is a more frequent site of skin cancer in head & neck area and about 30% to 35% of skin cancer occurs in the nose.[17-19] Mostly, these cancers are basal cell carcinomas (70%) and squamous cell carcinomas (25%).[17,18] In our study, we used the modified design of Zitelli's bilobed flap and reconstructed small partial thickness defects of the nasal tip and alar lobule in 33-patients. In our study, most of the defects were resulted from excision of basal cell carcinomas (49%) and squamous cell carcinomas (16%). We got excellent results from using bilobed flaps for these defects. The size of most of our defects was between 0.5 to 1 cm and we used skin mainly from the middle of nasal dorsum or side walls. In our study, we have observed minimal distortion of tissues and less incidence of dog ear formation. The resultant scars were imperceptible and the color and texture match, contour and symmetry were reasonably good. These features of bilobed flaps have been proven in many other similar studies by many authors.[1,5,9,10] All these studies recommended the bilobed flap for reconstruction of the small nasal tip defects and concluded that good cosmetic and functional outcomes can be obtained without major complications.[15,20-23]

There are few limitations with these bilobed flaps as observed in many studies.[12,24,25] These flaps often lead to round and vertical scars and retracted nasal ala due to tension on distal flap.[12,25] Similarly, pin cushion effect and distal flap necrosis can occur if the flap is not raised below muscular plane.[14,24] Other undesirable but less frequent side effects of these bilobed flaps are tissue bunching and dog-ear formation and can be avoided by excising an adequate Burrow's triangle from the point of rotation.[15,16,21,24] Regarding our study, post-operative courses were uneventful except in 3 cases (9%) where contour deformities occurred in 2 cases and erythema of scar in 1 case. These findings have also been observed in other similar studies.[1,12,15,24,25]

These bilobed skin flaps are considered superior to free skin grafts for reconstructing small nasal defects because of their excellent color and texture match.[3,9,10,11] Moreover, the extensive care required by skin grafts and avoidance of remote secondary sites are not associated with these flaps.[10,11] The Zitelli's bilobed flaps have got very simple design, are safe to elevate and results in minimal donor-site morbidity and achieving good cosmetic results.[8,10,13] All these qualities have made the bi-lobed flap very popular in facial plastic & reconstructive surgery.

Conclusion:
Zitelli's bilobed flap is a versatile and reliable flap. Its implementation is very easy especially when selection of patient and wound is carefully done and the principles of technique followed. The bilobed flap have got same color and texture match as that of the defect, can be reproduced easily, having low rates of complication and can be design in different sizes and tissue compositions.

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Role and contribution of authors:
Dr Firdous Khan, origenate concept and design the study.

Dr Zahid Iqbal, collected the data, and did the drafting.

Dr Firdous Khan, collected the data, and did the data analysis

Dr Ihsanullah, colelcted the data, references, and helped in the data analysis

Dr Muhammad Shadman, critically review the article and made useful changes

Dr Tahmeedullah, critically review the article and made final changes.

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