

VY aesthetic facial advancement for tumor defects

Rkain Ilham; Oussama Zenasni; Elhassouni Adam*; Borki Rajae; Zahid Aladdine; Mimouni Hicham

***Corresponding Author: Elhassouni Adam**

ENT surgery department, University Hospital, Al Kortobi Hospital Tangier, Morocco.

Email: elhassouniadam@gmail.com

Abstract

Objective: VY advancement flap was used for the first time by Ernst Blasius in 1848 for reconstruction of smaller defects.

We wish to describe V-Y advancement flaps and clarify its interest in the treatment of facial tumors and defects.

Materials and methods: 16 patients (mean age of \pm years; female sex) were included in our study. ENT examination was normal in all participants. In all patients the clinical features, laboratory data, X-rays were performed.

Inclusion criteria: all patients who benefited of the VY advancement flap in the treatment of facial tumors.

Patients who benefited from other surgical techniques in the treatment of facial tumors were excluded.

The planning, operative technique and the results with case presentations have been described.

Results: Sixteen consecutive adult patients with facial tumour aged 34 to 82 years were enrolled in this cross-sectional study with mean age of and sex ratio f/M to 0.8. 8 patients (50%) were very satisfied with the procedure and the results of the surgery, 7 patients were satisfied with the procedure, and only one patient was not satisfied with the result.

There is no statistically significant difference in relation to sex in the different parameters (age, age, age, socio-economic level and even satisfaction).

Conclusion: The VY advancement flap has many uses in the reconstruction of skin defects at various sites on the face. More than 70% of patients responded satisfied with the final results.

However, there is no correlation between satisfaction and the different parameters collected for this series of cases, probably at the size of the sample.

Keywords

VY advancement flap; Facial tumors; Facial defect.

Introduction

The incidence of skin tumors has increased dramatically worldwide in the last decade. Their conventional treatment is surgical removal. Facial reconstructions can be divided into four methods: primary closure, wound healing, skin grafts, and flap reconstruction.

Ernest Blasius described the principles and value of V-Y advancement flaps, many modifications have been proposed by others. Several studies concerning the use of V-Y advancement flaps have been published [1].

This flap receives an excellent blood supply from subcutaneous tissue and is ideal for use on the face.

In this article the V-Y flap has been shown to be an easy and excellent method for reconstruction of face's defect.

Patients and methods

Sixteen consecutive adults' patients with face's tumor aged between 34 and 82 years was recruited in this transversal study between January 2017 and December 2019 in the Department of Plastic Surgery and ENT at Al Kortobi Hospital, university hospital of Tangier, Morocco.

All patients agreed to enrollment in this study and signed written informed consent. The study was approved by the ethics review.

Patients' features and disease characteristics were assessed. Thus, the following parameters were collected at study entry: Age, sex, comorbidity (other chronic diseases requiring long- term medical care), clinical history, histological type, radiological examination, surgery, post- operative complications, post-therapeutic results and satisfaction (on a visual analog scale).

Tumor excisions were performed with a 0.5 cm perimeter and 1 cm perimeter of normal tissue for basal cell carcinoma and squamous cell carcinoma, respectively. Skin defects were reconstructed by the VY advancement flap.

Surgical technique of the VY advancement flap

Anesthesia: The choice of type of anesthesia is based on the size of the lesion, its location and the patient's terrain. Local anesthesia is performed by local infiltration of Lidocaine (Xylocaine* 1%) with or without adrenaline.

Excision of the lesion: The design of the flap is done with a skin marker pen preferably before infiltration

to avoid deformation of the edges, understanding the elasticity of the skin on its underlying tissue bed is essential in the design of the flap. The incision is made with a cold blade. The margins of resection must be respected according to the histological nature of the lesion. These margins have been codified by several recommendations [5,6] (Figure 1,2).

The operative specimen is oriented by wires and then sent for systematic anatomopathological examination with the study of the lateral and deep margins.

The raising of the flap: The surgeon changes gloves and instrumentation to avoid seeding tumor cells into the healthy area.

The shape and size of the defect is usually round or quadrangular, and the V-flap is designed to fit the defect.

The flap is raised in contact with the defect in an area where there is sufficient skin laxity and it can be mobilized without tension.

The V-flap is raised by making a deep incision from the skin to the dermis and into the subcutaneous fat, an isosceles triangle of skin is formed such that the base of the triangle is equal to the diameter of the defect and the length of the triangle is 1.5 to 2 times the dimension of the base. (Figure 3).

The placement of the flap: The distance of flap advancement is noted by the area of the point of the V at its new location relative to its location at the time of incision noted by the distance AB.

Once the flap is mobilized, the advancement distance is sutured first and then the apex of the triangle is sutured in place with U points sutures that secure the back edge of the flap and remove any residual tension on the rest of the flap. Therefore, the base of the triangle can be adapted to the skin defect, U-point sutures should be avoided at this level to avoid compromising the vascularization of the flap. Flap adaptation and donor site closure was performed in two layers using 4-0 absorbable suture material and 5-0 nylon sutures. No drains were used [4] (Figure 4).

Statistics

Descriptive statistics of patients and flap were calculated. Variables are expressed into qualitative and quantitative variables.

Respectively, the Wilcoxon rank sum test and Fisher exact test were used to perform between group comparisons. Univariate analysis tested most factors that were previously reported to be possibly related to satisfaction. A statistical significance level of $P < 0.05$ was used in all statistical tests performed. Analyses were performed using the SPSS 13.0 program.

The degree of satisfaction was measured by the visual analogue scale, being divided into three groups: very satisfied (7-10), satisfied (3-7), not satisfied (<3).

Results

Sixteen consecutive adults' patients with face's tumor aged between 34 and 82 years was recruited in this transversal study with mean age of 62.8 ± 12.5 , and sex ratio F/M 0.8.

Table 1 shows the characteristics of the patients in our study.

Table 1: Characteristics patients with facial tumor.

	Female sex	Male sex	p
Age (years)	57,8 ± 15,4	66,6 ± 8,8	NS
intellectual level			NS
- Primary	85,7	66,7	
- Secondary	0,0	33,3	
- University	14,3	0,0	
Socio economic level			NS
- Low			
- Average	42,9	44,4	
- High	42,9	55,6	
	14,3	0,0	
Phototype			NS
- II	57,1	22,2	
- III	42,9	55,6	
- IV	0,0	22,2	
Diagnosis delay	10,2±5,7	17,5±12,12	NS
Tumor Diameter	11,8±3,9	15,1±7,9	NS
aesthetic results (EVA) %			NS
- Very satisfied	71,4	55,6	
- Satisfied	28,6	33,3	
- Not satisfied	0,0	11,1	

Tumor sites were centrafacial in 14 cases with 8 cases in the nasal region, and 5 cases in the jugal region. The tumor diameters were from 8 mm to 35 mm with the mean was 14 mm. The tumor diameter is an important prognostic factor, in our series, we have a predominance of tumors between 10 and 20 mm with 9 cases. Histological examination of the tumor found 13 cases of basal cell carcinoma, and 3 cases of squamous cell carcinoma. Almost all patients were treated in local anesthesia with lidocaine 1% and adrenaline in 14 cases and 2 others patients refused to be operated on under local anesthesia. We used unilateral VY advancement flap in all patients, with 15 cases used alone and 1 case associated with a skin graft because the size of the flap proved to be insufficient to cover the skin defect. The flap direction was vertical in 10 cases and oblique in 6 cases. The VY advancement flap was performed after anatomical pathologist declare that the margins are clear. The VY advancement flap is a reliable flap and its complications are infrequent, we noted only one complication is a hematoma of the flap, and the rest of the patients had a good result. There was no flap necrosis or infection. 8 patients (50%) were very satisfied with the procedure and the results of the surgery, 7 patients were satisfied with the procedure, and only one patient was not satisfied with the result. All patients received regular follow up and the frequency was determined by histological type, prognosis, and quality of surgical treatment. Only one case of recurrence was observed in the nasal region, after 32 months of treatment of the initial tumor; both of tumors were treated with a VY advancement flap.

There is no statistically significant difference in relation to sex in the different parameters (age, age, age, socio-economic level and even satisfaction).

There is also no correlation between satisfaction and the different parameters collected for this series of cases.

Figures 5, 6, 7 and 8 show images of some patients in our series, before, after excision and at a distance from the placement of the flap.



Figure 1: Drawing of excision margins of squamous cell carcinoma and flap V. (The length and width of the flap).



Figure 2: Excision of squamous cell carcinoma with careful hemostasis.

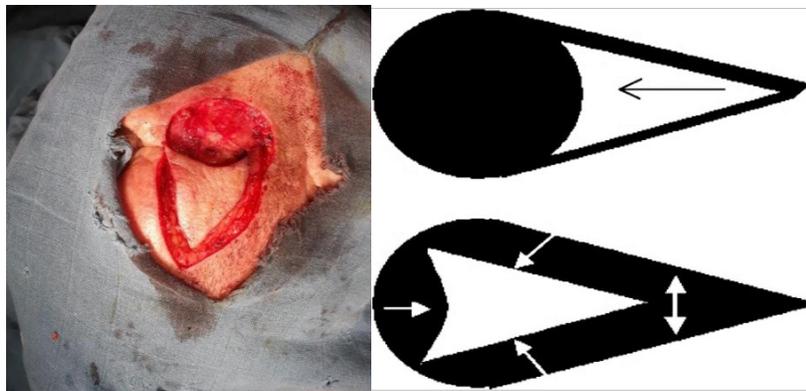


Figure 3: Incision of the V flap and its lateral dissection to allow its advancement.

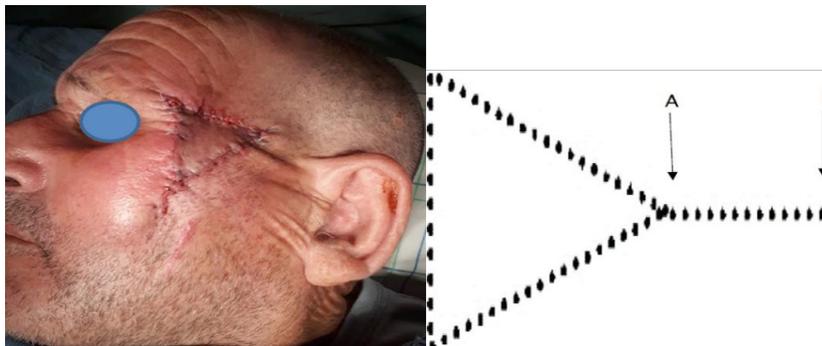


Figure 4: Postoperative outcome after Y closure with the advancement distance of the AB flap.



Figure 5: A) Ulcerative-bourgeois appearance of a tumor with hemorrhagic crusts and an erosive background in the temporofrontal region.
B) Result after one week.
C) Result after 3 months.



Figure 6: A) Ulcero-vegetative appearance of a tumor between the nasal and jugal area.
B) Result after one week.
C) Result after 3 months.



Figure 7: A) Pigmented basal cell carcinoma in the lateral wall of the nose
B) Immediate postoperative result with Y closure.
C) Result after 3 months.



Figure 8: A) Nodular appearance of a tumor surrounded by an ovoid nest and surmounted by telangiectasias in the jugal region.
 B) Result after one week.
 C) Result after one month.

Discussion

VY advancement flap is a random pattern flap, based on the fact that the flaps are lifted without taking into account their vascularization, which is delivered by the musculocutaneous arteries near the base of the flap. In the face, its richness in vascular systems allow flaps to be made with length/width ratios of 3:1 or 4:1, while in the extremities or in the thorax, it is only 2:1 [1].

The survival of the "random" flap depends not only on the length-to-width ratio but also on the physical properties (such as vascular resistance) of the vessels supplying the flap and the perfusion pressure of the flap. When the perfusion pressure falls below the critical closure pressure of the subcutaneous arterioles, cessation of nutritional blood flow and flap necrosis occur [2].

In our study, the size of the loss of tissue managed by the VY advancement flap varied from 14 mm to 46 mm from its long axis, with an average of 27 mm. We note that the majority of patients had a skin defect of less than 30 mm with 75% of cases and 25% of cases more than 30 mm. All patients were treated with the unilateral VY advancement flap. The VY advancement flap was used alone in 93.7% (15 cases) with only one case being used with a skin graft. In our series there were very few complications, we documented only one case of hematoma, due to the fact that the flap leaves a little dead space which was successfully managed by evacuation. The vascularization of our VY advancement flap is reliable, so we have not recorded any cases of suffering or partial or total necrosis of the flap.

In the literature, the risk of infection does not exceed 2.8% [3], but in our series, by respecting the asepsis protocols and with the systematic use of antibiotic prophylaxis, we did not record any cases of flap infection.

The satisfaction rate was analyzed in the aesthetic aspect based on the patient's answers, so half of the cases were very satisfied, 43.7% of the cases were satisfied and only one case was not satisfied. During the long-term post-operative follow-up we had only one case of recurrence of basal cell carcinoma in the nasal area, which is a high-risk area, after 32 months of treatment of the initial tumor.

Advantage

The color and texture of the flap are identical since it is a local flap, this type of flap can be performed under local anesthesia, which significantly reduces post-operative complications and the drawing and lifting of the flap are easy and simple, compared to other local flaps that are sometimes complex to draw

This flap has an excellent vascular supply from its subcutaneous tissue, and can cover even relatively large skin defects that can reach up to 4.5 cm according to a study by S. Yildirim [8], with a low risk of suffering or necrosis.

Most patients do not require hospitalization, it is an ambulatory surgery, in our series, 87.5% of cases were performed under local anesthesia.

The VY advancement flap preserves the natural curvature of the tissues. In our series, 97.3% of cases are satisfied with the results of the surgery. Depending on the geometric data compared to a rotation or transposition flap, the VY advancement flap minimizes tension on the skin defect with the Y closure eliminating tension on the flap [9].

Disadvantages

Since a V-Y flap also creates a smaller dead space, it has a lower risk of postoperative complications such as seromas and hematomas [10].

Cosmetically, the VY advancement flap can sometimes leave an unnatural looking triangular scar, this situation can be improved by placing at least one of the edges of the triangle in a natural wrinkle. Despite the fact that the formation of abnormal scars is less frequent than with other flaps, the scars are not linear and are difficult to correct to make them invisible [10].

Conclusion

The VY advancement flap is a so-called "random" skin flap; it is raised without taking into account its vascularization; its survival is ensured by the dermal and subdermal plexus

The VY advancement flap has many uses in the reconstruction of skin defects at various sites on the face.

The VY advancement flap has the ability to use tissue that is in close proximity to the skin defect and therefore has a similar quality of skin in terms of color and texture.

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Authors Information: Rkain Ilham^{1,2}; Oussama Zenasni⁴; Elhassouni Adam^{1*}; Borki Rajae³; Zahid Aladdine⁵; Mimouni Hicham¹

¹ENT surgery department, University Hospital, Al Kortobi Hospital Tangier, Morocco.

²Abdelmalek Saadi University, Faculty of Medicine and Pharmacy, Tangier, Morocco.

³ENT Unit, Provincial Hospital, Tetouan, Morocco.

⁴Ophthalmology department, University Hospital, Al Kortobi Hospital Tangier, Morocco.

⁵Plastic surgery department, University Hospital, Al Kortobi Hospital Tangier, Morocco.

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