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Survival and aesthetic outcome of local flaps used for reconstruction of face defects after excision of skin malignancies: Multi-institutional experience of 175 cases

Yasser Helmy, Ahmed Taha and Abd EL-Nasser Khallaf.

(Al-Azhar University- Plastic Surgery Department, Cairo)

Abd El-Fattah Al-Sheikh

(Al-Azhar University Onco-Surgery Unit, Cairo)

Abstract

Background: Local facial flaps are frequently used reconstructive option and are carrying very good outcome as regard matching, texture, and less scarring. This study was designed retrospectively to evaluate the flap survival and aesthetic outcome of the three commonly used local facial flaps.

Material and methods: Retrospective analysis of 175 patients whom were managed by local fasciocutanous flap reconstruction using advancement flap, nasolabial flap, and forehead flap.

Results: Total flap survivals. Of 80 patients of advancement flaps 8 showed flap edge dehiscence, but all healed conservatively. Of 10 flaps underwent transposition local flaps in the nose, no any flap shows dehiscence. Of 52 nasolabial flaps, 2 showed dehiscence and of 33 forehead flaps, one showed dehiscence. All flaps were survived without any complications and V-Y advancement flaps were carried out the best aesthetic outcome.

Conclusion: Local face flaps for reconstruction of post malignancy facial defects are carrying a sensational survival, however advancement flap carries the best aesthetic outcome.

Keywords: Local Face flaps- skin malignancies- survival- aesthetic- outcome.

Introduction

Many predisposing factors have been described for skin malignancies in the face, with different incidence presentation for the most common three types of skin cancers, Basal, squamous carcinomas and melanoma.[1,2,3,4] Multimodalities treatment have been described for each type and presentation management, in the form of; surgical excision, cryosurgery, radio ablation, electro cauterization and curettage but surgery have been reported to be the best line of treatments of skin cancers.[2,4,5] Surgeries for reconstruction of defects following excision of skin cancer from the face are including direct closure, skin grafting, local and distant flaps. Skin graft carries up a higher scar outcome risk and not suitable when there is exposed cartilage or bone or when defects are in tinny curved areas as been located in medial or lateral canthi or at facial

aesthetic angles and of course it carries up the contracture potentiality[6]. Hence free flap is limited indication for reconstruction of skin cancer defects, the direct closure of the defect and local flaps are the most indicated and implemented techniques. Primary closure is an easy and suitable in small defects, otherwise it carries the risk of excessive wound tension and future aggressive linear scar. Local flaps in face commonly used for reconstruction of face defects with the advantages of good matching, soft texture and without another donor site morbidity when it is in comparison with skin graft and free flaps.[2] We are reviewing and sharing our experiences in use of the three-common local fasiocutanous flaps in order to reconstruct face defects after skin cancer excision..

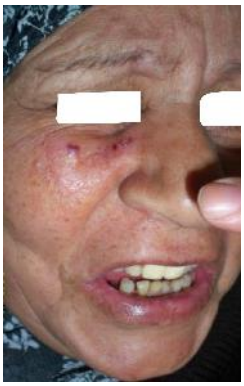
Materials and Methods

Retrospective multi centric analysis for 254 patients complained of skin cancers in form of basal cell carcinoma, squamous cell carcinoma and melanoma and who were underwent surgical excision, followed by reconstruction of the resultant defect 3-4 days later, in most cases, except in 18 non-melanoma cases, they were underwent excision, intraoperative frozen section biopsy and immediate reconstruction. Retro analysis is achieved over a period of 3 years (from January 2014 to January 2017).

Sites of cancer distributed as the following: 63 cases in the nose, 21 cases in upper lip, 11 cases in lower lip, 15 cases in check inferior and medial to lateral canthus,13 cases inferior and lateral to medial canthus, 18 cases at forehead, 10 cases at scalp area,17cases at the mandibular margin and 7 cases at preauricular area.

Free histopathological safety margins were confirmed completely as regard periphery and depth. Of 254 cases, 79 patients who underwent surgical reconstruction by direct closure, skin graft, or free flaps, and all were excluded from our study. 175 patients who were managed by local flap reconstruction in face by using advancement flaps for 80 patients (Figure 1).

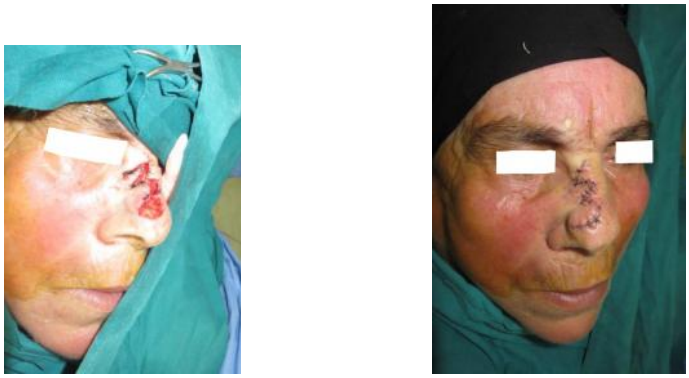
A



B

Figure 1: 55 years old female patient (A) presented by BCC at check lid margin (B) Closure by single advancement flap

Reported advancement flaps have included single, double or pedicle V-Y advancement flaps. 10 cases underwent transposition or rotational flaps for nasal reconstruction (Figure 2). Nasolabial flaps were done for 52 patients (Figure 3).



A B

Figure 2: 65 years old female patient (A) presented by post BCC excision defect on right side of the nose (B) Closure by transpositional flap.

A B C

Figure 3: 40 years old female patient (A) preoperative (B) post SCC excision defect on right side of the nose and small papule over the upper lip (C) closure by nasolabial flap for nasal lesion and direct closure of the lip defect

A B C

Forehead flaps were performed for 33 patients, 20 of them with routine forehead flap, 10 with median forehead flap and 3 with extended ipsilateral paramedian forehead flap which was designed with wright angle, continuation in the contralateral forehead side in dimensions equal or less than 2×2 cm. The dimensions of extended part are being according to defect's size, aiming to be covered. This innovated extension is depending on the unique network vascularity's anastomosis of the forehead, and its donor site could be closed in transverse pattern, so patient get inverted L shaped scar (Figure 4).

D E F

Figure 4: 40 years old male patient (A) presented by BCC (B) Defect after excision and design of extended paramedian forehead flap (C) Flap setting (D, E) 3months post-operative lateral and front views (F) Basal view.

This scar is of two limbs, the transverse one is within natural forehead creases, while vertical one as simple as the regular scar of paramedian forehead flap.

Defects after excision were sized range from 2cm×3cm to 3×4 cm. Preoperative routine investigations, preparations and postoperative care with medications and local ointments were prescribed for all patients.

110 were male and 65 were females aged from 35-75 with mean age of 55 years. Of 175 patients 147 were due to basal cell carcinoma, 26 due to squamous cell carcinoma and other non-melanoma cancers, and 4 due to melanoma. Regional lymph nodes and distant nodes were free by clinical examination and investigations for suspicious cases. Informed consents for surgery and photography were obtained from each patient. Study were carried out at multi-centric review at Al-Hussein, Sayed Galal, AL-Harm, and Nasser Institute hospitals, Cairo (Egypt). Study was approved by the university ethical committee.

Results

Retrospective analysis hasn't reported any perioperative major complication, donor site complication or any flap necrosis. All flaps sensationally survived but some has reported edges desquamation and dehiscence. Incidence of dehiscence in study cases were in 11 cases, 8 of them were advancement flaps, 2 of them were nasolabial flaps and 1was median forehead flap. No any dehiscence or any other complication has been reported in trans-positional or rotational flaps cases. Average patient follow up was 18 months and ranged from 6 months to 2 years with 3 cases report of malignancy recurrence then operated again in the cases submitted for excision of skin malignancy then immediate reconstruction after frozen section biopsy. There weren't any of cases underwent radio or chemotherapy.

All flaps were survived without any other complications, no any report for hematoma, seroma or serious wound infection. Both nasolabial and forehead flaps cases were undergoing second stage operation for the separation of flaps, but advancement flap doesn't. Donor sites of the flaps were closed directly but in some forehead flaps, actually in 2 cases, donor site has needed small patch of postauricular skin graft. Some cases of forehead flaps were undergoing on another procedure for thinning or debulking 3-6 months later. Aesthetic outcome of the scars was accepted in all cases, because most of cases are old ages, they have laxer skin. The less the scars, the better the aesthetic outcome, so advancement flap carried out the best aesthetic outcome. All patients were totally agreeing the designed procedures and accepting the aesthetic results, although some of them asked for ancillary procedures for scar resurfacing.

Discussion

Most skin malignancies are found in the face,[7] they are mostly treated by surgical excision, histopathological clearance, then later reconstruction, in spite of previous reports, including authors' one, about immediate reconstruction after frozen section biopsy[8]. Face has well defined facial aesthetic units[9] and subunits for all parts, from hair line to the neck. These aesthetic units are well known to each board certified plastic surgeon and they are the keystones which are enabling the surgeon to get functional and at the same time cosmetic reconstruction. Aesthetic units are described according to function, tissue matching, relaxed skin lines,[4] relations to bonny, cartilaginous, or condensed subcutaneous tissues.

The most common histopathological incidence in facial skin malignancy is the basal cell carcinoma resembling about 75% of non-melanoma skin malignancy according to Jacobs et al study[10]and this not completely correlated with our study when it finds the incidence of non-melanoma skin cancer 97.7%. This could be explained by cumulative exposure in sunny country, with less white skin of the Egyptian population, where is the study was carried out and the incidence was 97.7%. This finding could make sense about the "incidence difference" between western and middle east countries. Whatever our findings show higher incidence than report comes from the American cancer society statistics[11] at year 2015, when it stated it is about 80% incidence of non-melanoma skin cancer.

BCC is characterized by been locally invasive with rare metastases and arises from basal cell of the epidermis[10]. BBC mainly due to cumulative sun exposure over long time and many lines of treatment have been practiced including surgical excision, radiotherapy, electro-dissection, Mohs[16]technique, cryosurgery and curettage[4,12]. This study shows that, surgery is the main line of treatment practiced by surgeons for BCC and it shows the incidence of BBC in non-melanoma skin cancer is about 85%.

In this study, Squamous cell carcinoma incidence is about 15% of non-melanoma skin cancer and this less correlated with other findings where it was 22% in other worldwide statistics.[14]

Melanoma is fatal disease and its incidence in western contraries is high, it reaches about 2-3% of total cancers in whites and every year new incidence of disease, with more than 10000 people die all over the world every year because of Melanoma.[11, 12,13] Melanoma to total skin cancer incidence in our study is about 2.7%, while in other narrow scale study carried out by Ki Hyun et al, it was 3%, although this finding nearly agrees our study. Skin type of Egyptians falls mainly in range from 3-4 Fitzpatrick, and of course it is different from the skin type of western populations, which mostly ranges from skin type 1-3. However, there is less frequent clear report in literature about percentage of melanoma and non-melanoma skin cancer when referred to total skin cancers in western countries and in the American cancer society statistics.[11] On the other side, this study is considered a simple highlight for health care providers in Africa, as African countries' reports about skin cancer incidence are still rare.

Facial blood supply is unique. Good face vascularity provides unlimited potentiality for wound healing, following malignancy excision

and reconstruction by local flaps. The most common local flaps used to reconstruct the face are the advancement flap, nasolabial and forehead flaps[4]. With the design of each flap, surgeon considers relaxed skin tension lines, adequate tissue coverage, tissue pliability, if associated any composite or cartilaginous grafts, special areas and angles. The most important facial aesthetics and angles are peri-occular,[15] medial,[17] lateral canthi, oral commissures, lid margins nasolabial folds, facial aesthetic units, nasal units, check units, lip units, frontonasal, nasolabial and columella-labial angles. Other factors considered during planning for surgery are underlying tissue type; bony, cartilaginous or subcutaneous and the mobility of the skin in both donor and recipient sites. [18,19,20]

In this study, local flap reconstruction in face reported using advancement flaps for 80 patients, transposition flaps in 10 cases, nasolabial flaps for 52 patients, and forehead flaps for 33 patients, 20 of them with routine forehead flap, 10 with median forehead flap and 3 with extended contralateral forehead flap. Total wound dehiscence in our analysis was about 6.2% with incidence of 10% in advancement flaps, 3.8 % in nasolabial flaps and 3% in forehead flap. No any dehiscence or any other complication has been reported in transposition flap cases. All flaps were survived without any other complications, no any report for hematoma, seroma or serious wound infection.

Skin advancement flap is random pattern displacement flap, it was undergoing for majority of cases as it is simple straight forward and it is possible to be slightly under tension because of the increased skin laxity which is found in population after 50 years. It is better used to reconstruct small sized defects less than 2 cm, than moderate sized defects 2-4cm, and could be raised bilaterally when needed.[2] Tension closure and subsequent dehiscence, dog ears deformities, and early unpleasant scaring are the most common early sequelae of advancement flap. In this study 8 cases of 80 about, 10 % underwent advancement flap, had been showed wound dehiscence and were treated by fully conservative way, by local oily base ointment, and closed dressing. This study has reported higher incidence of dehiscence of Flap, when compared with another study, published by Jagdeep and Kaustubh[4] on 2016 as their incidence was only about 4.6%, but agree totally with their study in that; All advancement flaps were survived without any loss or partial necrosis and all are getting more improvement in the aesthetic outcome by time.[4]

Nasolabial flap is raised on perforating branches of angular artery which is the coming continuation from facial artery. It could be raised superiorly or inferiorly based, according to the defect site, and it is suitable for reconstruction of nasal sides, alae,[21,22] upper and lower lips.

In this study, 2 flaps of 52 nasolabial flaps, were complicated by edge dehiscence and treated conservatively, but now any flap failure, necrosis or partial loss at any.

In our review of 52 cases underwent reconstruction by nasolabial flap, all flaps are survived and donor sites were closed directly, whatever some flap donor sites were required check dissection for closure, and mostly raised superiorly based pedicle, and some reported early postoperative congestion specially when used as turnover flap to reconstruct the nasal alae and these are coming in agreement with most practiced designed techniques for nasal reconstruction[22,23,24]. Some cases of nasolabial flap reconstruction were submitted for flap refining 6-12 months later.

Forehead flap is dating back to ~700 BC, described in Indian medical treatise, *Sushruta Samita*, and was Known later in Europe and America in in the 1500s and 1830s respectively[25].

In this study forehead flaps for 33 patients were done, 20 of them with routine forehead flap, 10 with median forehead flap and 3 with extended ipsilateral paramedian forehead flap, and only one case of the median fore- head flap shows dehiscence, was treated by conservative ointment dressing.

Forehead flap mostly raised on supratrochlear artery; however, it is described by Kazanjian at 1930s on both supraorbital and supratrochlear arteries, and many descriptive modifications have been innovated in literature, median forehead flap was prescribed by Labat[27] and paramedian by Millard[25]. In this study both flaps were reported but the paramedian forehead flap was frequently used in surgeries included in the study, and this correlated with Millard consideration as regard reduction of morbidity and maintaining viability[26]. However, the contralateral forehead flap[28] and seagull-shaped flap designs[29] were found in our analysis. Forehead flap pedicle width was 1.3-1.5 cm and the tip was increased to 2cm to cover nasal defect up to 2cm width and this technique safely provides good pedicle and width for reconstruction. This study reports the highly safe potentiality and survival of forehead flap and totally agrees with Reece, Bryan and others [25,30]. This study also reported the innovated idea design for transversely extended paramedian forehead flap, to the contralateral side, in wright angle, in order to get more tissue in 3 cases. This innovated extension was proceeded in patients with short forehead or when there is need for double layer reconstruction of the nasal ala. The idea of transversely extended forehead flap is based on the vascular network pattern and anastomosis between the forehead vessels and to avoid its extension to hairy scalp.

All forehead flaps were obviously survived and donor sites were closed primary in vertical line, this line was extended for transverse closure in the innovated transverse extension of ipsilateral paramedian forehead flap. Some cases underwent flap refining about 6 months later but refining incidence of forehead flap were less than nasolabial as the design of terminal part used for reconstruction was harvested more thinner tissue under the dermis and this typically agreeing the refinement's reports[25,26,27].

Conclusion

All local commonly raised flaps used for reconstruction of face defects after excision of skin malignancies are completely survived. Aesthetic outcome was satisfactory in all flaps, however advancement flap carries the best aesthetic outcome because of relatively less scar lines.

Conflict of interest

“The authors declare that there is no conflict of interest or funding regarding the publication of this paper.”

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References

1. Baser B, Pradhan KA. Bipedal myocutaneous flap for one-stage reconstruction of the cheek after cancer surgery. J Laryngol Otol 1988; 102:601-2
2. Ki Hyun Kwon, Dong Gwan Lee, Su Han Koo, Myoung Soo Jo, Heakyeong Shin, Jung Hyun Seul. Usefulness of V-Y Advancement Flap for Defects after Skin Tumor Excision. Arch Plast Surg. 2012 Nov; 39(6): 619–625. Published online 2012 Nov 14. doi: 10.5999/aps.2012.39.6.619 PMCID: PMC3518005
3. Tara L. Fernandez, Derek R. Van Lonkhuyzen, Rebecca A. Dawson, Michael G. Kimlin, and Zee Upton. Characterization of a Human Skin Equivalent Model to Study the Effects of Ultraviolet B Radiation on Keratinocytes. Tissue Eng Part C Methods. 2014 Jul 1; 20(7): 588–598.
4. Rao JK, Shende KS. Overview of local flaps of the face for reconstruction of cutaneous malignancies: Single institutional experience of seventy cases. J Cutan Aesthet Surg 2016; 9:220-5
5. Utler DF, Parekh PK, Lenis A. Imiquimod 5% cream as adjunctive therapy for primary, solitary, nodular nasal basal cell carcinomas before Mohs micrographic surgery: A randomized, double blind, vehicle-controlled study. Dermatol Surg 2009; 35:24-9.

6. Gloster HM Jr. The use of full-thickness skin grafts to repair nonperforating nasal defects. J Am Acad Dermatol 2000; 42:1041-50.
7. Hajdarbegovic E, van der Leest RJ, Munte K, Thio HB, Neumann HA. Neoplasms of the facial skin. Clin Plast Surg 2009; 36:319-34.
8. Yasser Helmy, Ahmed Taha, Samy Eleoayman Farahat, And Mohamed Yousef. Frozen Section Biopsy Reliability for Immediate Reconstruction after Tumors Excision from the Face. Egypt, J. Plast. Reconstr. Surg., 2014; Vol. 38, No. 2, July: 171-175,
9. Naini FB. Facial aesthetics: concepts and clinical diagnosis. Oxford: Wiley-Blackwell; 2011.
10. Jacobs GH, Rippey JJ, Altini M. Prediction of aggressive behavior in basal cell carcinoma. Cancer 1982; 49:533-7
11. American cancer society statistics 2015. Available on web site till 2017 at: http://www.cancer.net/cancer-types/skin-cancer-non-melanoma/statistics
12. Lalloo MT, Sood S. Head and neck basal cell carcinoma: Treatment using a 2-mm clinical excision margin. Clin Otolaryngol Allied Sci 2000; 25:370-3.
13. Ferlay J, Steliarova-Foucher E, Lortet-Tieulent J, et al.Cancer incidence and mortality patterns in Europe: Estimates for 40 countries in 2012. European Journal of Cancer 2013;49, 1374-1403.
14. Lomas A1, Leonardi-Bee J, Bath-Hextall F. A systematic review of worldwide incidence of nonmelanoma skin cancer. Br J Dermatol. 2012 May;166(5):1069-80
15. Hayano SM, Whipple KM, Korn BS, Kikkawa DO. Principles of periocular reconstruction following excision of cutaneous malignancy. J Skin Cancer 2012; 2012:438502.
16. Mott KJ, Clark DP, Stelljes LS. Regional variation in wound contraction of Mohs surgery defects allowed to heal by second intention. Dermatol Surg 2003; 29:712-22
17. Czyz CN, Cahill KV, Foster JA, Michels KS, Clark CM, Rich NE. Reconstructive options for the medial canthus and eyelids following tumor excision. Saudi J Ophthalmol 2011; 25:67-74.
18. Belmahi A, El Mazouz S, Gharib NE, Bencheikh R, Ouazzani S. The bilobed flap: A very efficient method in aesthetic reconstruction of small skin defects at the alar and tip regions of the nose. Ann Chir Plast Esthet 2003;48:211-5.
19. Baker SR. Local Flap in Facial Reconstruction. 2 nd ed. St. Louis, MO, USA: Mosby; 2007.
20. Zitelli JA, Fazio MJ. Reconstruction of the nose with local flaps. J Dermatol Surg Oncol 1991;17:184-9.
21. Rohrich RJ, Conrad MH. The superiorly based nasolabial flap for simultaneous alar and cheek reconstruction.PRJ.2001;108(6):1727–30
22. Muhammed Bilal, Irfan Ullah,Esanullah. Nasolabial flap: a workhorse for the reconstruction of nasal ala after tumor resection. JKCD December 2014, Vol. 5, No. 1
23. Massoud KS. Reconstruction of Full-Thickness Alar Defect by theTurnover Nasolabial Flap: Improving the Outcome by Primary Flap-Thinning and Unilateral Alar Base Suturing. Egypt, J. Plast. Reconstr. Surg. 2009; 33(1): 15-9.
24. Sohn WI, Choi JY, Seo BF, Jung SN. Reconstruction of nasal ala with nasolabial perforator flap after cancer removal. Head Neck Oncol. 2012 30;4(4):83-7
25. Bryan J. Correa, William M. Weathers, Erik M. Wolfswinkel, and James F. Thornton. The Forehead Flap: The Gold Standard of Nasal Soft Tissue Reconstruction. Semin Plast Surg. 2013 May; 27(2): 96–103
26. Menick F J. Aesthetic refinements in use of forehead for nasal reconstruction: the paramedian forehead flap. Clin Plast Surg. 1990;17(4):607–622.
27. Labat MDe la Rhinoplastie, Art de Restaurer ou de Refaire Completement la Nez [Dissertation], Paris, France: Imprimerie de Ducessois; 1834
28. Rees T D. Philadelphia, PA: WB Saunders; 1980. Aesthetic Plastic Surgery.

29. Millard DR. Midline forehead skin flap. In: Berish S, editor. Grabb's Encyclopedia of Flaps. Vol. 1. Philadelphia, PA, USA: Lippincott Williams & Wilkins; 2009. p. 99-100
30. Reece E M, Schaverien M, Rohrich R J. The paramedian forehead flap: a dynamic anatomical vascular study verifying safety and clinical implications. Plast Reconstr Surg. 2008;121(6):1956–1963

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