CASE REPORT

Reconstruction after Big Nasal Tumors

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Abstract

This article comes as a presentation of the clinical experience in the plastic surgery department. Gather the experience of 3 clinical cases, more representative, with different histopathological tumors, of important dimensions that occupied a large part of the facial anatomical unit, the nose. The article is structured by presenting the risk factors that are the causes of malignant lesions and by recalling the therapeutic options and general principles of addressing large lesions. Malignant lesions that occur most frequently in the nose are reviewed. We consider that it is a serious health problem, with various consequences, of a functional nature, which can affect the airways and aesthetically that can lead to a reconsideration of self-respect and the perception of the affected person towards his peers. The approach of the cases was done sequentially. The first surgical stage involved the excision of the lesion with the oncological safety limit, the defect being larger than the lesion and the more elaborate therapeutic options on the reconstruction scale. The first operative stage ended each time with covering the defect with a graft to have the confirmation of the histopathological examination, free of the tumor. The second stage of the treatment involved lifting the flap and accommodating it. The last surgical stage involved the sectioning of the pedicle and its reintegration into the donor area.

Keywords: nasal reconstructive, glabellar flap, skin cancer.

Rezumat

Lucrarea de față, vine ca o prezentare a experienței clinice din cadrul secției de chirurgie plastică. Adună experiența a 3 cazuri clinice, mai reprezentative, cu tumori de tip histopatologic diferite, de dimensiuni importante ce ocupau o mare parte din unitatea anatomică facială, nasul. Articolul este structurat prin a prezenta factorii de risc ce sunt cauze ale apariției leziunilor maligne și prin a reaminti opțiunile terapeutice și principiile generale de abordare a leziunilor de mari dimensiuni. Sunt trecute în revistă forme de leziuni maligne ce apar cel mai frecvent la nivelul nasului. Considerăm că este o problemă de sănătate gravă, cu consecințe variate, de ordin funcțional, ce pot afecta căile aeriene și estetic, că pot duce la o reconsiderare a respectului de sine și a percepției persoanei afectate față de semenii ei. Abordarea cazurilor a fost făcută secvențial. Prima etapă chirurgicală a presupus excizia leziunii cu limita de siguranță oncologică, defectul fiind mai mare decât leziunea, iar opțiunile terapeutice mai elaborate pe scara reconstrucției. Prima etapă operatorie s-a încheiat de fiecare dată cu acoperirea defectului cu o grefă pentru a avea confirmarea examenului histopatologic, liber de tumoră. Etapa a doua a tratamentului a presupus ridicarea lamboului și acomodarea acestuia. Ultima etapă chirurgicală a presupus secționarea pediculului și reintegrarea acestuia în zona donoare.

Cuvinte cheie: reconstrucție nazală, lambou glabellar, cancer de piele.

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INTRODUCTION AND GENERAL PRINCIPLES

Skin cancer is the most common form of cancer diagnosed in the world, exceeding the combined incidence of breast, prostate, lung and colon cancer cases annually. The most frequent non-melanoma skin cancers of the face and thus of the nose are basal cell carcinoma (BCC) and squamous cell carcinoma (SCC).

BCC is the most common cutaneous malignancy worldwide and accounts for nearly 80% of all skin cancers. There is marked worldwide geographic variability, most often affecting light skin populations in locations with high UV exposure. Mortality is rare, but there are locally aggressive BCC than can result in significant patient morbidity.

The predominant risk factors include: intense sunlight and UV exposure, Fitzpatrick skin types I-II, a family history of skin cancer, male sex, smoking, human papilloma virus, exposure to arsenic or hydrocarbons, previous radiation and immunodeficiency resulting from acquired immunodeficiency syndrome or systemic drugs required for transplant recipients. It usually arises sporadically, but there are BCC associated with several clinical syndromes like Bazex syndrome, Gorlin syndrome (basal cell nevus syndrome) and xeroderma pigmentosum.

Cutaneous squamous cell carcinoma accounts for 15-20% of all skin cancers. Similar to BCC there is a marked geographic variability in the incidence of SCC with more patients in areas with increased sun exposure.

The risk factors include: sun and UVA, UVB exposure, Fitzpatrick I-II types, fair hair, a history of radiation, chronic inflammation, exposure to arsenic or hydrocarbons, chronic immunosuppression secondary to organ transplantation, infections with HPV, previous non-melanoma skin cancers, additionally there are certain inherited disorders such as xeroderma pigmentosum, epidermolysis bullosa and albinism.

After the excision of these types of skin cancers the plastic surgeon has a few possibilities to cover the remaining defect.

On the reconstructive stairway we can first allow the wound to heal by secondary intention, then there is direct tissue closure, afterwards the split thickness skin graft, then local tissue transfer, regional tissue transfer and finally the free tissue transfer, which are the most laborious and hard to realize.

Nasal reconstruction in our Clinic usually uses:

1. transposition flaps like bilobed flap (Zitelli's Flap) with the vascular pedicle consisting of angular artery branches, facial vein, ophthalmic vein, ophthalmic, maxillary and facial nerves; nasolabial flap, vascular pedicle formed from microcutaneous perforating vessel from the facial artery supplies the inferiorly based flap and the angular artery supplies the superiorly based flap, venous drainage is from the facial vein and the nerve supply is via the infraorbital nerve; paramedian forehead flap, the arterial supply if from the supratrochlear artery
2. advancement flap like cheek advancement flap (Moustarde flap) has the arterial supply to the medial cheek from the facial artery, venous drainage from the facial vein and sensory nerve supply is predominant from the infraorbital nerve, although there may be some cross-over with the zygomatic and mental branches of the facial nerve, motor supply via branches of the facial nerve; dorsal advancement flap (Rintala Flap), the vascular pedicle consisting of dorsal nasal vessels
3. rotation flaps like glabellar flap, the arterial supply if from the contralateral nasal dorsal artery.

You can also use a septal flap for defects of the cartilaginous septum. The septal branches originate from the facial artery and the incisive artery.

For free transfers the most used ones are preauricular free flap with its vascular pedicle the superficial temporal artery branches 0.65-0.82mm and radial forearm free flap with the vascular pedicle having the radial artery 1.0-2.5mm, venae comitantes of 0.8-1.2mm and collector vein caliber of 2-3mm.

Of course one can also use a composite graft which is a free tissue transfer and not a flap and the neovascularization occurs from the surrounding vascularized mucosa and skin^{1,2,3}.

The paramedian forehead flap method that is a very old and constantly improved technique^{3,4,5,6,7,8,9,10,11,12,13,14}.

OBJECTIVES

The primary objectives of this study are to underline the epidemiology and risk factors of skin cancers, considering they are a major health problem with increasing numbers worldwide, describe the surgical techniques and outcomes of the reconstruction of the nose after large tumor resection with paramedian forehead flap in a 2 stage fashion³ but with reintegration of the pedicle in the forehead after the separation.

METHODS

The following article is a retrospective case study performed on 3 patients with large tumors of the nose, for which they underwent surgery using multiple flaps to cover the defects.

The coverage of the defects produced by excision was done in a subsequent operative time.

Extensive excision of the tumor involved covering the defect with a skin graft. The anatomopathological result was defining for the next surgical stage.

The first patient is a 82 years old male with hypertension and bilateral ectropion, whom first came to the clinic in 2017 with a cystic tumor on the dorsum nasi for which he underwent surgery, excision and bilobed flap for closure. The tumor reoccurred in 2019 and the second time they evacuated the cystic formation and performed direct closure.

In 2020, he came to the clinic with a large ulcerative tumor on the dorsum nasi, right alar region and right nasal wing for which they performed a split-thickness skin graft in order to see if the excision was tumor free. The right alar cartilage and right triangle cartilage were infiltrated so they performed rescission and a reconstruction of the lining with a buccal mucosal graft and afterwards the defect was covered with a paramedian forehead flap. The flap was separated after 4 weeks and accommodated to the nose. The patient was very happy with the final result. Unfortunately the invasion of the tumor was too profound and they could not get a free margin so the patient is at risk for recurrence. The patient is under clinical observation at 6 months by observing the evolution.

The histopathological results showed cutaneous squamous cell carcinoma G2 pT3 pNx pMx.

The second patient is a 50 years old male with hypertension, diabetes mellitus type II and postoperative hypothyroidism, secondary to thyroidectomy, whom first presented in 2017 with a nodular tumor on the dorsal aspect of the nose, for which he underwent excision and a bilobed flap for closure. In 2019 the tumor reoccurred and after excision they performed direct closure.

In 2020 the patient presents to the clinic with a large ulcerative tumor on the dorsum and right wing of the nose for which they first did a full thickness skin graft and after receiving the histopathological result concluding the margins were free of tumor they did a paramedian forehead flap. The flap was separated af-

Multiple photos of the preoperative, intraoperative and postoperative aspects of the reconstruction

Multiple photos of the preoperative, intraoperative and postoperative aspects of the reconstruction

ter 6 weeks and accommodated. The patient was also pleased with his final result.

The histopathological results showed basal cell carcinoma.

The last patient is the case of an old woman with a nasal tumor involving almost all regions of the nose. The patient came from a rural environment, with an occupational exposure to the sun. They chose a vertical axis forehead flap to cover the defect and split skin graft was used to support of the missing septal cartilage and both alar regions. The entire nasal defect was covered reconstruct lining of middle vaults and anterior vestibules. Conchal cartilage was used to restore with a large forehead flap. The residual forehead defect was covered with a skin graft and cheek advancement flap was used to repair the cheek component of the defect. After 6 weeks the forehead pedicle was divided. The final result was functional and aesthetically pleasant.

The histopathological results showed basal cell carcinoma.

Multiple photos of the preoperative, intraoperative and postoperative aspects of the reconstruction

In all our cases the frontal flap was normally infused with capillary pulse present, normally colored and with a local temperature similar to that of the surrounding skin. There was no case of partial or total necrosis of the flap.

What was characteristic to our cases was the fact that all the flaps after the pedicle was divided had the pedicle reinserted into the frontal region in order to reuse a forehead flap for future reconstruction.

DISCUSSIONS

Postoperatively, the patients were free of symptoms, with no ophthalmic or breathing deficits and put on clinical observation to discover any possible recurrence or new sites of tumors.

It is very important to discuss preoperatively what is cosmetically and functionally achievable and balance it against what the patient feels will be acceptable.

When performing this type of interventions, one must consider factors that will affect the flap and graft viability or wound healing like diabetes, vascular disease or previous radiotherapy. Having the ability to perform a wide range of techniques allows you to choose the one most suited for your patient's needs.

The stage of surgical treatment is a correct medical decision.

The anatomopathological result produces a treatment algorithm that could be vicious by performing the excision and flap covering the defect in a single stage.

Follow-up of the patient according to a well-established protocol, even for those surgically cured, must be done responsibly by both the doctor and the patients.

Compliance with ethics requirements: The authors declare no conflict of interest regarding this article. The authors declare that all the procedures and experiments of this study respect the ethical standards in the Helsinki Declaration of 1975, as revised in 2008(5), as well as the national law. Informed consent was obtained from all the patients included in the study.

References

1. „Grabb and Smith's Plastic Surgery”, 7th edition, 2014, page 12, 115-116.
2. „Flaps- Practical Reconstructive Surgery”, 2017, Thieme Publishing, pages 582-607.
3. Complex Nasal Reconstruction Using Locoregional Flaps BOGDAN MIHAI MARINESCU^{1,2}, CRISTIAN DRAGOS STEFANESCU^{1,2,3*}, IOANA TUHARI¹, DRAGOS MURARU¹, IONUT GUZGANU¹, RAZVAN HAINAROSIE^{2,4}, RADU CRISTIAN JECAN^{2,5}
4. Shokri T, Kadakia S, Saman M, Habal MB, Kohler S, Sokoya M, Ducic Y, Wood-Smith D. The Paramedian Forehead Flap for Nasal Reconstruction: From Antiquity to Present. *J Craniofac Surg*. 2019 Mar/Apr;30(2):330-333.
5. Fischer H. Nasal reconstruction with the paramedian forehead flap--details for success. *Facial Plast Surg*. 2014 Jun;30(3):318-31.
6. Angobaldo J, Marks M. Refinements in nasal reconstruction: the cross-paramedian forehead flap. *Plast Reconstr Surg*. 2009 Jan;123(1):87-93.
7. Sanniec K, Malafa M, Thornton JF. Simplifying the Forehead Flap for Nasal Reconstruction: A Review of 420 Consecutive Cases. *Plast Reconstr Surg*. 2017 Aug;140(2):371-380.
8. Schreiber NT, Mobley SR. Elegant solutions for complex paramedian forehead flap reconstruction. *Facial Plast Surg Clin North Am*. 2011 Aug;19(3):465-79.
9. Quatela VC, Sherris DA, Rounds MF. Esthetic refinements in forehead flap nasal reconstruction. *Arch Otolaryngol Head Neck Surg*. 1995 Oct;121(10):1106-13.
10. Zito PM, Mazzoni T. Paramedian Forehead Flaps. 2020 Oct 15. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2020 Jan.
11. Bruschi S, Bocchiotti MA, Gugliotta Y, Mangia A. Paramedian frontal flap including galea: The right balance between aesthetics and functionality in the reconstruction of the lower third of the nose. *J Plast Reconstr Aesthet Surg*. 2020 Oct;73(10):1897-1916.
12. Reece EM, Schaverien M, Rohrich RJ. The paramedian forehead flap: a dynamic anatomical vascular study verifying safety and clinical implications. *Plast Reconstr Surg*. 2008 Jun;121(6):1956-1963.
13. Beederman M, Jaffe J, Kuchta K, Warner J. Office-Based Forehead Flaps: A Safe and Reliable Reconstructive Option. *Ann Plast Surg*. 2021 Mar 1;86(3):287-291.
14. Martinez-Lopez A, Perez-Lopez I, Garcia-Dura E, Tercedor-Sanchez J. The Single-Stage Paramedian Forehead Flap. *Actas Dermosifiliogr*. 2017 Nov;108(9):867-868.
15. Kleintjes WG. Forehead anatomy: arterial variations and venous link of the midline forehead flap. *J Plast Reconstr Aesthet Surg*. 2007;60(6):593-606.
16. de Bonnecaze G, Chaput B. An innovative reconstruction procedure of total nasal resurfacing with a bipediced propeller perforator flap. *Head Neck*. 2019 Sep;41(9):3049-3055.
17. Isik D, Kiroglu F, Isik Y, Goktas U, Atik B. Clinical outcomes of suture delay in forehead flap. *J Craniofac Surg*. 2012 Jan;23(1):
18. Santos Stahl A, Gubisch W, Fischer H, Haack S, Meisner C, Stahl S. A Cohort Study of Paramedian Forehead Flap in 2 Stages (87 Flaps) and 3 Stages (100 Flaps). *Ann Plast Surg*. 2015 Dec;75(6):615-9.
19. Ribuffo D, Serratore F, Cigna E, Sorvillo V, Guerra M, Bucher S, Scuderi N. Nasal reconstruction with the two stages vs three stages forehead flap. A three centres experience over ten years. *Eur Rev Med Pharmacol Sci*. 2012 Nov;16(13):1866-72.
20. Singh GC, Withey S, Butler PE, Kelly MH. Forehead flap method for total nasal reconstruction. *Asian J Surg*. 2006 Apr;29(2):101-3.
21. Skaria AM. Median Forehead Flap: A Reliable Alternative for Nose Repair. *Dermatol Surg*. 2015 Jul;41(7):859-62.
22. Shumrick KA, Campbell A. Improvements in forehead flap design for nasal reconstruction. *Facial Plast Surg*. 1998;14(2):165-71.
23. Skaria AM. The median forehead flap reviewed: a histologic study on vascular anatomy. *Eur Arch Otorhinolaryngol*. 2015 May;272(5):1231-7.
24. Mutaf M, Ustuner ET, Celebioglu S, Kocer U, Sensoz O. Tissue expansion-assisted prefabrication of the forehead flap for nasal reconstruction. *Ann Plast Surg*. 1995 May;34(5):478-84; discussion 485-7.
25. Kunishige JH, Zitelli JA. Prelaminated and Prefolded Paramedian Forehead Flap for Loss of the Nasal Tip. *Dermatol Surg*. 2015 Sep;41(9):1071-3.
26. Abdelwahab M, Kandathil CK, Most SP, Spataro EA. Utility of Indocyanine Green Angiography to Identify Clinical Factors Associated With Perfusion of Paramedian Forehead Flaps During Nasal Reconstruction Surgery. *JAMA Facial Plast Surg*. 2019 May 1;21(3):206-212.
27. Park SS. Revisiting the single-stage forehead flap in nasal reconstruction. *JAMA Facial Plast Surg*. 2013 Sep-Oct;15(5):383-4.
28. Kheradmand AA, Garajei A, Motamedi MH. Nasal reconstruction: experience using tissue expansion and forehead flap. *J Oral Maxillofac Surg*. 2011 May;69(5):1478-84.
29. Fudem GM, Montilla RD, Vaughn CJ. Single-stage forehead flap in nasal reconstruction. *Ann Plast Surg*. 2010 May;64(5):645-8.
30. Rudy SF, Abdelwahab M, Kandathil CK, Most SP. Paramedian forehead flap pedicle division after 7 days using laser-assisted indocyanine green angiography. *J Plast Reconstr Aesthet Surg*. 2021 Jan;74(1):116-122.
31. Baltu Y, Dölen UC, Aydin O. Extended Central Artery Perforator Propeller Flap for Large Nasal Defects. *J Craniofac Surg*. 2019 Nov-Dec;30(8):2408-2411.
32. Yen CI, Chang CJ, Chang CS, Chen HC, Chien MH, Hsiao YC. Laser hair removal following forehead flap for nasal reconstruction. *Lasers Med Sci*. 2020 Sep;35(7):1549-1554.