

Maxillofacial reconstruction following the excision of basal cell carcinoma: Case report

LK Surej Kumar ¹, SA Khalam ^{1*}, MM Jacob ¹, S Manuel ¹, NM Kurien ¹, MP Vaghese ¹

Abstract

Introduction

Local flaps have been commonly used in the reconstruction of small facial defects left after excision of primary tumours. However, larger defects often present a surgical difficulty and may necessitate free flaps. However, in the repair of such large defects, multiple local flaps may prove to be a viable and satisfactory alternative.

Case Report

We resected a lesion 4*5cm size, quadrilateral in shape, on the left ala of the nose, extending on to the dorsum, left infra orbital and malar regions along with a wide margin of normal tissue. Reconstruction of the resultant defect was done using multiple local flaps namely the paramedian forehead flap, the lateral cheek rotation flap & the platysma myocutaneous flap.

Discussion

Facial defects can be managed with the correct choice of local flap. Local flaps being easy to harvest and handle, provide good results due to good matching of the skin in terms of colour, texture, and thickness.

Conclusion

Our case, throws light, on the versatility of multiple local facial flaps for maxillofacial reconstruction.

Introduction

Wide local excision with an adequate cuff of normal tissue has been the traditional method of achieving clear resection margins for cutaneous malignancies. However, wide local excision presents unique problems in the head and neck region, owing to the proximity to the functionally critical and cosmetically prominent structures of the face¹. Excision of head and neck cancerous lesions may result in exposure of vital structures such as the brain, eye, aerodigestive tract or major neurovascular structures. If inadequately reconstructed, such defects may result in significant complications and/or impairment in the performance of routine daily functions, such as speech and swallowing. In addition, esthetic disfigurement may be very significant to the patient's self-image and social adaptability.

Wide excision always necessitates adequate reconstruction. Reconstructive surgery has emerged to become an indispensable part of surgical oncology and

currently, reconstructive surgery is considered an integral part of the multidisciplinary treatment of patients with cancer of the head and neck. The history of reconstructive surgery can be traced back to India as long ago as 600BC^{2,3}. This field began out of the demand for facial reconstruction following amputations of the nose, which was a common form of punishment and a way of stigmatizing individuals at the time. Today, the etiology of nasal defects has changed, but the basic principles of facial reconstruction have stood the test of time

Local flaps have proved their worth in the milieu of facial reconstructive surgery. For effective reconstruction of facial defects, it is imperative that, the maxillofacial surgeon have a thorough understanding of the geometry of the various flaps, local facial anatomy, and the biomechanics of skin and soft tissues. The creative integration of all these variables helps the surgeon, to arrive at the design of the optimal flap to suit his needs.

Though local facial flaps have been commonly used in the reconstruction of small facial defects left after excision of primary tumours, larger defects often present a surgical difficulty and may necessitate skin grafts and/or free flaps. However, in the repair of such large defects, multiple local flaps may prove to be a viable and satisfactory alternative. We present a case, which throws light, on the versatility of multiple local facial flaps for maxillofacial reconstruction.

Case Report

A 39 yr. old male patient underwent excision of a recurrent basal cell carcinoma (BCC) lesion, (Figure 1) 4*5cm size,



Figure 1: Basal Cell carcinoma ulcer measuring 4*5 cm.

*Corresponding author
Email: drsherin666@gmail.com

¹ PMS College of Dental Science & Research, Trivandrum, India

quadrilateral in shape, on the left ala of the nose, extending on to the dorsum, left infra orbital and malar regions; at our facility. We resected the lesion along with a wide margin of normal tissue. Reconstruction of the resultant defect which can be appreciated in Figure 2; was done using multiple local flaps. The part of the defect over the dorsum and left ala was closed with a right paramedian forehead flap (Figure 3). The part of the defect over the right malar area was closed with a lateral cheek rotation flap (Figure 4). The part of the defect over the left malar region was closed with a platysma myocutaneous flap (Figure 5). The defect of the donor site of the forehead flap was covered by split thickness skin graft taken from the chest. A pictorial representation of all the flaps used have been given in Figure 6. Post-operative picture which is completely disease free shown in Figure 7.

Discussion

The basic tenets of reconstructive surgery include restoration of form and function while minimizing donor site deformity. Whenever possible, this should be accomplished with similar tissue⁴. Respecting facial esthetic units or subunits by placing scars following skin creases is an essential principle to be borne in mind. The options for head and neck reconstruction have been described schematically as a ladder, starting from direct closure and skin grafting and moving forward to local flaps, regional cutaneous and myocutaneous pedicle flaps, and finally to the wide variety of micro vascular free flaps⁴. Starting from the simplest method and if required, to move over to the next step on the reconstructive ladder, is a commonly followed practice. The current suggested approach, however, is to select the reconstructive option which best provides the patient with the ideal reconstruction, thus maximizing functional and esthetic results primarily.

The three flaps we used for closure of the defect in our case were the paramedian forehead flap, lateral cheek rotation flap and the platysma myocutaneous flap.



Figure 4: Cervical facial rotation advancement flap being mobilised for closure of right cheek defect.



Figure 2: Primary defect after excision of primary tumour.



Figure 3: Forehead flap being mobilised.

Paramedian forehead flap

The forehead flap still remains the workhorse for major nasal reconstruction and has undergone several modifications over the years. Availability of skin, the accurate colour and texture match, and time tested dependability distinguish it from other flaps. The dependability of the forehead flap still fuels further advances that continue to push its limits. Some controversy remains over the midline versus paramedian terminology for the forehead flap³. The distinction refers to the location of the skin paddle of the flap, i.e. precise midline versus paramedian, but in either case the pedicle tapers to a single medial brow region. The theoretical advantage of the paramedian flap is that it is cantered over the supratrochlear artery and therefore has additional vascularity. The supratrochlear artery arborizes extensively in the subcutaneous plane, superficial to the frontalis muscle, and courses vertically up the forehead.

The advantages of the forehead flap are: (1) contiguous availability, (2) good match in colour and texture, (3) excellent blood supply⁵. The resultant scar in a midline forehead flap is located precisely in the midline, as opposed to the paramedian vertical scar in a paramedian

Competing interests: None declared. Conflict of interests: None declared.
All authors contributed to conception and design, manuscript preparation, read and approved the final manuscript.
All authors abide by the Association for Medical Ethics (AME) ethical rules of disclosure.

flap, is generally considered to be slightly more acceptable. While both scars generally heal quite well, they are oriented perpendicular to the relaxed skin tension lines and are occasionally detect.

The paramedian forehead flap has largely replaced the median forehead flap for nasal reconstruction, because it has a more axial design, narrower base, and a greater effective length. This also allows the simultaneous or sequential usage of two vertically oriented flaps, if needed. The muscle and subcutaneous tissue may be removed from the flap or retained, depending on the thickness and pliability required⁶.

In our case we used this flap to cover the dorsum, ala and up to the skin surface of the upper lip. The pedicle is usually separated 3 weeks after transfer. We followed the practice & did the procedure 3 weeks after our primary procedure under local anesthesia⁶.

Cervical facial rotation advancement flap

Large defects of the cheek pose a reconstructive challenge due to their extremely visible site, as well as limited local tissue supply. The cheek, in addition, abuts several structures of expressive function, such as the eye, the mouth, and the local facial musculature. To achieve satisfactory functional and aesthetic results, reconstruction of such defects necessitate careful three dimensional restorations of all missing components, adequate texture matching, as well as functional restoration. Reconstruction of facial defects should adhere to the priority goals of first preserving function and second achieving cosmesis⁷.

Aesthetically, the cheek can be divided into three overlapping units: (1) suborbital, (2) preauricular, and (3) buccomandibular^{7,8}. Zone 1, the suborbital zone, extends along the lateral border of the nose to the nasolabial fold, across the cheek below the gingival sulcus toward the sideburn, up the anterior sideburn to the lateral crow's-foot line, and then along the lower eyelid cheek junction.



Figure 7: Disease free post operative follow up after one year.



Figure 5: Platysma myocutaneous flap mobilised and sutured for closure of left cheek, can be seen, sutured to the margins of the forehead flap. The bolus dressing over the split skin graft used for closure of the defect of the forehead flap can be seen and the scar of the forehead flap area used for the previous surgery can also be appreciated.



Figure 6: Forehead flap, Cervical facial rotation advancement flap for the right cheek and Cervical facial rotation advancement flap for closure on the left cheek.

Zone 2, or the preauricular area, extends from the helical junction with the cheek across to the sideburn to overlap with zone 1 at the malar prominence. This area includes the tissues over the parotid-masseteric fascia and extends inferiorly to the mandibular angle a lower mandibular border. The buccomandibular area (zone 3) extends from a vertical division at the middle cheek down to the mandibular margin^{7,8}.

In the case of Zone 1, underlying superficial tissues in this region are the lower orbital fibers of the orbicularis oculi muscle. Laterally, the masseter arises from the outer surface of the maxillary buttress. The branches of the facial nerve lie on the masseter on the underside of the orbicularis oculi and quadratus muscles. In this location, wounds not amenable to primary or skin graft closure may

Competing interests: None declared. Conflict of interests: None declared. All authors contributed to conception and design, manuscript preparation, read and approved the final manuscript. All authors abide by the Association for Medical Ethics (AME) ethical rules of disclosure.

respond well to rhomboid, circular, or bilobed flaps. In addition, cervicofacial flap design or tissue expansion with rotation from a more lateral site is helpful for larger defects. Regional flaps such as anteriorly based cervicofacial flap, deltopectoral flap, and pectoralis major flap are an additional option for reconstruction at this location^{7,8}.

We carried out a Cervical facial rotation advancement flap for coverage on the right side which includes the Zone 1 subunit, as has been previously described. We could achieve adequate coverage of the defect and our results were satisfactory

Platysma Myocutaneous flap

The platysma flap is a very useful flap and can be used to reconstruct the cheek, floor of the mouth, lower lip and even pharyngeal defects^{9,10}. The arterial supply of the platysma flap has been studied by many investigators. This flap is supplied by branches of the submental, facial, superior thyroid, transverse cervical and occipital arteries¹¹. Imanishi et al found that the arterial branches penetrated the platysma and did not run into the platysma layer and the platysma was only supplied by small vessels from the arterial branches^{10,12}. So, the platysma flap should be considered fasciocutaneous rather than musculocutaneous. Regardless of the nomenclature, reconstructive surgeons generally agree that the platysma flap has a high success rate. We could achieve good coverage of the tissue defect on the left side of the face, which included all the three zones of the cheek as previously described.

Conclusion

Evolving reconstructive techniques have greatly advanced the approach to facial reconstruction. However, several factors still continue to play a substantial role in reconstructive outcome.

Potential tumour margins, radiotherapy, and lymph node dissection must all be taken into account when planning major reconstructive procedures. Considerations in timing also play a vital role in planning of reconstruction. Immediate repair may seem to be straightforward option; however, closure attempts that must await final pathology evaluation or potential further resection may require a staged approach with a delayed closure of the defect.

Considered an important part of the reconstructive armamentarium, local flaps such as the paramedian forehead flap, cervical facial rotation advancement flap & platysma myocutaneous flap are versatile options in facial reconstruction. Facial defects can frequently be managed with the correct choice of local flap. Probably, the local flaps provide the best result due to the good matching of the skin in terms of colour, texture, and thickness and adhere to one of the basic principles in plastic surgery "Replace like with like".

References

1. Andrews G: Primary resection of cutaneous malignancies of the head and neck. *Operative Techniques in Otolaryngology* (2013) 24,pg 9-12
2. Sushruta S. In: *The Sushruta Samhita*. Bhashagratna KK, translator. Calcutta: Kaviraj Kunja Lal Bhashagratna; 1907.
3. Park S S: Nasal Reconstruction in the 21st Century-A Contemporary Review. *Clin Exp Otorhinolaryngol*. 2008 March; 1(1): 1-9.
4. Disa J J, Santamaria E, Cordeiro P G : General Principles of Reconstructive Surgery for Head and Neck Cancer. In: Shah J P, Patel S G, editors. *Atlas of Clinical Oncology, Cancer of the Head and Neck*, BC Decker Inc, Hamilton; 2001; pg 330-357
5. Converse J M. New forehead flap for nasal reconstruction. *Proc R Soc Med*. 1942 Oct;35(12):811-812
6. Baker S R: Interpolated Paramedian forehead flap. In: Baker S R, *Local flaps in Facial Reconstruction*, Second Edition, Mosby Elsevier Inc 2007, Pg 265-312
7. Millard D R. *Principles of Plastic Surgery*. Boston, MA: Little, Brown; 1986.
8. Heller L, Cole P and Kaufman Y: Cheek Reconstruction: Current Concepts in Managing Facial Soft Tissue Loss, *Semin Plast Surg*. 2008 November; 22(4): 294-305.
9. Peng L W, Zhang W F, Zhao J H, He S G, Zhao Y F. Two designs of platysma myocutaneous flap for reconstruction of oral and facial defects following cancer surgery. *Int J Oral Maxillofac Surg* 2005; 34:507-513
10. T. Su, Y.-F. Zhao, B. Liu, Y.-P. Hu, W.-F. Zhang: Clinical review of three types of platysma myocutaneous flap. *Int. J. Oral Maxillofac. Surg*. 2006; 35: 1011-1015
11. Rabson JA, Hurwitz DJ, Futrell JW. The cutaneous blood supply of the neck: relevance to incision planning and surgical reconstruction. *Br J Plast Surg* 1985;38: 208-219
12. Imanishi N, Nakajima H, Kishi K, Chang H, Aiso S. Is the platysma flap musculocutaneous? Angiographic study of the platysma. *Plast Reconstr Surg* 2005; 115: 1018-1024