RECONSTRUCTION OF NON-MELANOTIC FACIAL TUMOURS WITH LOCAL FLAPS; REPLACING LIKE WITH LIKE

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ABSTRACT

Objective: To assess the outcome of early skin tumour excision and reconstruction with regards to tumour margin clearance, recurrence and aesthetic results of reconstruction.

Study Design: Quasi experimental.

Place and Duration of Study: This study was carried in the department of Plastic and Reconstructive Surgery Combined Military Hospital (CMH) Rawalpindi, Pakistan from January 2010 to December 2012.

Patients and Methods: All patients having tumours of the cheek, upper and lower lips, nose and forehead, who underwent primary surgical excision and reconstruction with local flaps, were included in the study. Patients with nodal or distant metastasis were excluded. Tumours were excised with safe margins and defects reconstructed with local facial flaps. Patients were regularly followed up as per protocol for basal cell carcinoma (BCC) and squamous cell carcinoma (SCC).

Results: Eighty nine patients aged between 37-86 years with a mean age of 59.4 years (SD ± 9.24) were included in the study. There were 58 (65%) cases of basal cell carcinoma (BCC) and 31 (35%) of squamous cell carcinoma (SCC). Recurrence was seen in 3 (5.2%) cases of BCC and 2 (6.4%) cases of SCC. There was 1 (1.1%) complete and 4 (4.5%) partial flap losses. The follow-up period ranged from 4 months to 3 years with average of 16 months.

Conclusion: Local flaps give a simple option for facial reconstruction for postoncological resection defects giving good aesthetic match due to local tissue.

Keywords: Basal cell carcinoma, Facial reconstruction, Squamous cell carcinoma.

INTRODUCTION

Squamous and basal cell carcinoma of the face is a significant problem in our patient population due to occupational and socioeconomic factors[1,2].

In early stages (I and II) surgery is curative as the biological behavior of these cancers is usually loco-regionally invasive[3]. The most important goal is to obtain a tumor-free patient. Several studies have outlined the surgical parameters necessary for the excision[4-6]. Well-defined primary basal cell carcinomas (BCCs) less than 2 cm in diameter should be excised with 4.0 mm margins to obtain a 95% cure rate[5,7]. Primary squamous cell carcinomas (SCCs) require 4.0 mm margins for low-risk tumors and 6.0 mm margins for high-risk tumors (≥2.0 cm; >II histological grade; nose, lip, scalp, ears, eyelids; invasion into the subcutaneous tissue) to obtain a 95% cure rate[4,6].

Another aim is to give better quality of life by allowing better facial aesthetics and function than if no reconstruction was used.

Different methods of reconstruction can be used ranging from skin grafts, local flaps, regional flaps and free flaps. Grafts do not have an intact blood supply or drainage, and have to re-establish a blood supply and drainage from the recipient bed. Skin grafts can only cover superficial defects and have a natural tendency to contract and may not take the placement properly. Also, because of the color mismatch, they are not cosmetically identical to the face.

Flaps are segments of tissue that retain some form of blood supply, which allows them to be living tissue, when transferred.

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Free flaps can be used to cover large defects especially of the lip, cheek and oral mucosa, but require advanced skill and special instruments, not forgetting a long anesthesia time and may not be warranted in small defects resulting from excision of early skin tumors.

Local flaps are those that are derived from the immediate area of resection and common examples of these include the swing slide, bilobed, naso-labial and the forehead flap. These types of flaps are advanced, transposed, interpolated or rotated into position. The blood supply of most of these flaps is either via an axial pattern or by a random pattern. Axial flaps receive their blood supply from a single nutrient vessel while random pattern flaps receive capillary blood supply in a random pattern from all directions and not from a single nutrient vessel.

In this study, we review our experience with facial reconstructions after excision of non melanotic skin tumors with local flaps.

PATIENTS AND METHODS

Consecutive patients (n=89) who underwent excision and reconstruction of early nonmelanoma skin cancers of the face, from Jan 2010 to Dec 2012, were included in this study carried out at CMH Rawalpindi. Tumours stage (T1 and T2, N0 and M0) I and II were included in the study. The American Joint Committee on Cancer (AJCC) TNM system was followed. No patients with recurrent tumours were included in this study. Patients with history of previous radiotherapy or having nodal and /or metastatic disease were excluded. Patients who underwent direct closure or reconstruction of post resection wounds by skin grafts were also excluded from the study.

After an incisional biopsy confirmed the malignancy, all patients underwent excision of the skin cancer with margins appropriate for the type, behavior, and size of the lesion. A margin of 3-4 mm was taken for BCC and 5-10 mm margin for SCC. All specimens underwent histological examination. Frozen section was not done in these patients. All wounds were managed by local flaps. The excisions were performed under local anesthesia or local anesthesia plus intravenous sedation, except in those patients whose wounds were closed with a forehead or cheek advancement/rotation flap, who received general anesthesia. In patients who underwent surgery in local anaesthesia 1% lignocaine with adrenaline was used.

The reconstructive modality of choice depends largely on the location, size, and depth of the surgical defect. The reconstructive technique, procedure and the flap design was thoroughly discussed with the patients in the pre assessment clinic. Also, pre-operative photos were routinely taken immediately prior to surgery. An informed consent was signed by the patient and countersigned by the surgeon. The technique of anesthesia, the flap design, and the duration of operation were recorded.

Postoperatively; the flap was monitored for color changes, temperature and the capillary filling time. The postoperative complications and involvement of tumor margins on histopathology report (if any) was documented. None of the patients were given radiotherapy.

For lip reconstruction parameters used to guage a successful outcome included, restoration of lip function, acceptable cosmetic appearance, minimal donor morbidity. Lip functions were described as static competence; occlusion of oral sphincter at rest without drooling, dynamic competence during eating solid and liquid diet and phonation. Cosmetic parameters were defined mainly to include the integrity of vermilion surface, evenness of red margin and acceptable size and contour of the mouth. Follow up of squamous and basal cell carcinoma was as per National Comprehensive Cancer Network NCCN[7] practice guidelines in oncology. It was done every 3-6 months for 2 years, every 6-12 months for 3 years then annually for life SCC. For BCC complete skin examination was done for 6-12 months for life. Patients were educated to

minimize sun exposure and on techniques of self examination.

Evaluation of late aesthetic outcome was according to the following parameters: absence of disfigurement or functional morbidity of the donor site, accepted symmetrical appearance and patient's satisfaction aesthetically.

Analysis was made from the data by using SPSS version 16.0. Quantitative variables were expressed as mean and standard deviation (SD), whereas frequencies and percentages were shown for qualitative variables.

RESULTS

Eighty nine patients with age range of 37-86 years and mean age of 59.4 years (SD ± 9.24) were included in the study. Fifty five patients (62%) were males. There were fifty eight (65%) cases of BCC and 31 (35%) of SCC. Five patients (6%) had underlying xeroderma pigmentosa. Four of these patients had BCC and one SCC. The most common involvement site was nose (44%), followed by cheeks (34%), lips (14%) and forehead (8%). For cheek reconstruction nasolabial flap, check advancement and check rotation flaps were most commonly used. For lip reconstruction Karapandzic technique, Primary Abbe (Lip switch) flap was used. We had good restoration of lip function, acceptable cosmetic appearance and minimal donor morbidity in all cases of lip reconstruction. Nasal reconstruction was commonly performed with the help of forehead, nasolabial, glabellar and bilobed flaps. Switch and advancement flaps were used for forehead reconstruction (table-1). All margins were clear on histopathological report except in 3 (3%) patients in whom the tumour was reaching upto the margins. Reexcision and flap advancement was done in all 3 cases. No residual tumour was found on histological examination. Recurrence was seen in 5 (5.61) cases, 3 (5.1%) cases of BCC and 2 (6.5%) cases of SCC. Re-excision and reconstruction was done in both the cases. There was 1 (1.17.) forehead flap (done for nasal) loss due to venous congestion which was managed by full thickness skin graft after flap loss. There were 4 partial flap losses.

Table-1: Percentages of different flaps used for reconstruction.

Region	Flap	n (%)
Nose	Nasolabial	9 (10%)
	Forehead	14 (15.7%)
	Bilobed	9 (10%)
	Combined forehead and nasolabial	2 (2.2%)
	Glabellar	3 (3.5%)
Cheek	Cheek rotation	16 (17.9%)
	Cheek advancement	8 (9%)
	Nasolabial	4 (4.5%)
	Swing slide	3 (3.5%)
Nose and cheek	Combined cheek rotation and forehead	2 (2.2%)
Forehead	Swing slide	4 (4.5%)
	Advancement	3 (3.5%)
Lip	Karapandzic	7 (7.9%)
	Abbe	3 (3.5%)
	Nasolabial	2 (2.2%)

Debridement was done and wounds were allowed to heal with secondary intention in all 4 cases. Haematoma was seen in 3 (3.4%) cases all of which were promptly drained. Thirteen patients were lost to follow up. In the rest the follow-up period ranged from 4 months to 3 years (mean 16 months).

DISCUSSION

Non-melanoma skin cancer is the most common form of malignancy in white population and its incidence is on the rise in Pakistan too[8]. An increase in incidence is expected because of the aging population and greater exposure to solar ultraviolet radiation from depletion of the ozone layer[9]. The two primary histological types of non-melanoma skin cancer are basal cell carcinoma (BCC) and squamous cell carcinoma (SCC). BCC is more common than squamous cell carcinoma[8]. Metastatic spread of BCC is rare, but the malignancy is associated with substantial morbidity and high health-care costs[10]. Both of these are common in the head and neck region.

BCC is found most frequently on the face[11] most common location is the nose (specifically the nasal tip and alae), while SCC accounts for 20% of cutaneous malignancies[12,13] and 90% of all head and neck cancers. According to the 2011 National Comprehensive Cancer Network (NCCN) clinical practice guidelines in oncology: basal cell and squamous cell skin cancers, the goal of treatment is elimination of the tumour with maximal preservation of function and

Figure-1: Basal cell carcinoma (BCC) cheek in a 70 year old lady, excision done with a 4 mm margin and reconstructed with a cheek rotation flap with good aesthetic late post oparative results.

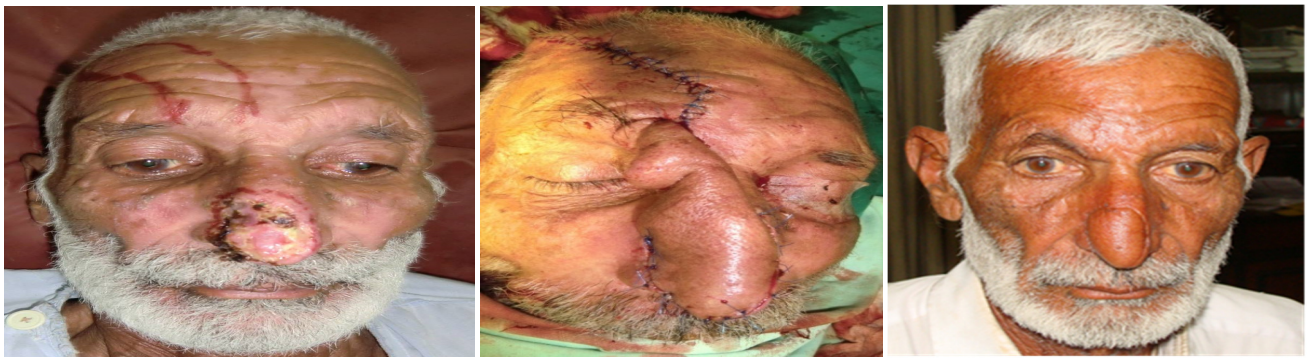

Figure-2: Squamous cell carcinoma of the nose in a 68 year old male. Excision done with a 5 mm margin. Reconstruction of the inner lining and defect done with a forehead flap. Late post operative picture after flap division showing good colour match.

Figure-3: BCC of the upper lip. Reconstruction with Abbe switch flap. Late post operative picture showing matching hair growth.

Figure-4: BCC nose biopsy scar. Reconstructed with Glabellar Flap. Very good late post operative results.

physical appearance[7]. We used surgical excision as the treatment modality in our study and were able to achieve a tumour free status effectively.

Surgical excision is probably the most commonly used technique. Cure rates vary from 98% for BCCs smaller than 1 cm to 92% for BCCs larger than 1.5 cm, and from 96.9% to 92.1% for SCC[14,15]. We had similar cure rates, 94.8 for BCC and 93.5% for SCC over a shorter period of time. With longer follow up of these patients we would be in a better position to compare our recurrence rates for early BCC and SCC with the developed world.

Usually, 4 mm margins are the norm for these rates. We removed the tumor with a 3-4 mm margin in cases of BCC and a 5 mm -10 mm margin in cases of SCC[16]. We had to re excise only 3 (3.4%) of the lesions and they also showed no residual tumour on the histopathology report.

Once these tumours are removed, defects are created which need to be reconstructed to achieve good colour and texture match (good aesthetic results) while limiting the donor site morbidity as much as possible. Local flaps have the potential to provide all this. They replace like with like, have good colour and texture match, may be performed in a single stage, and their donor sites can be closed primarily with little morbidity. Their disadvantages include a random blood supply limiting flap length, the potential for distortion of surrounding structures in closure of the donor site, and limited bulk for the repair of deep defects.

But these disadvantages can be eliminated or greatly reduced if the reconstructed defect is small and an appropriate flap is chosen for the defect. No single flap is optimal for every defect. Each defect must be individually analyzed for depth, distortion of surrounding subunits, and normal tissue available for reconstruction

Forehead defects in our study were reconstructed by mainly transposition and advancement flaps. We found that multiple deep skin creases within this area provide excellent camouflage for incisions. Care was taken to avoid distortion of the eyebrow and incisions were placed within skin creases when possible.

Reconstruction of nasal defects must preserve the integrity of complex facial functions and expressions, as well as facial symmetry and a pleasing aesthetic outcome. The reconstructive modality of choice depends largely on the location, size, and depth of the surgical defect.

Keeping this in mind we used various local flaps for nasal reconstruction. We used the bilobed flap advocated by Zettili as the repair of choice for defects located between 0.5 and 1.5 cm of the distal and lateral aspect of the nose, particularly defects involving the lateral tip, supratip, or defects near the tip 17-19. On the lower third of the nose, where the skin is least mobile, the bilobed flap allows the surgical site to be filled with nearby skin and matched for color and texture; it then allows for repair of the secondary defect with another well-matched flap from a nearby donor site. In case of defects with diameters between 1.5 and 2.0 cm and involving the alar lobules, nasolabial transposition flap was used for reconstruction in this difficult area, in defects greater than 2.5–3 cm in diameter which we found difficult to close with a nasolabial flap a forehead flap was used for reconstruction. In cases where reconstruction of internal linning was also required It was also used as turnover flap. A combination of nasolabial and forehead flap was used in 2 cases. The Glabellar flap was used in our study to cover dorsal nasal defects not involving the tip. It provided local skin with an exact colour, thickness, and contour match for the nasal skin. We found it to be a safe flap, the donor site morbidity being minimal.

For cheek reconstruction, cheek dvancement flaps were used when the elasticity and mobility of the skin allowed undermining and closure of defects along the medial cheek. For defects near the nasofacial sulcus the flap was tacked to periosteum of the nasal bones to relieve tension in the distal flap and prevent dehiscence. The flaps elevated near the inferior lid were pulled laterally and not inferiorly to prevent ectropion.

For larger defects of the cheek, cheek rotation flap was used. For lip reconstruction mostly the Karapandzic and Abbe flap were used. The Abbe flap had the slight disadvantage of being a two stage flap. The Karapandzic flap provided good oral sphincter integrity. Both the flaps had good cosmetic results as the vermilion was reconstructed with similar tissue. Our results of lip reconstruction are similar to results quoted in other studies[20]. The late outcome in our cases was assessed by regular examination during a follow up period. There was good coverage of the defects, no disfigurement and no donor site morbidity. Symmetrical appearance of the face was acceptable and the patients were satisfied by the aesthetic and functional outcome.

CONCLUSION

Our results show that local flaps in facial defect reconstruction provide excellent skin color and texture match, and they can usually be performed in a single stage. Their donor sites can be closed primarily with little morbidity and absence in most cases of any secondary defect.

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