Case Series

Varied Presentations of Basal Cell Carcinoma and Its Management with Reconstruction of Defects: An Experience from a Tertiary Healthcare Centre

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Abstract

Introduction: Basal cell carcinoma (BCC) originates in the basal layer of the epidermis and spreads slowly, usually locally before metastasizing. Adequate margins of excision during surgery are curative. Reconstruction of facial abnormalities resulting from excision is crucial yet difficult. **Materials and Methods:** A literature review was conducted to determine the most prevalent guidelines guiding the best reconstruction of postexcisional defects on the face, and a retrospective review of hospital records for patients treated for BCC of the face at our institute during the previous 3 years, which ranged from September 2020 to September 2023, was carried out. The records of 28 patients with BCC over the face who underwent surgical management including reconstruction at our hospital were identified and details were recorded. The details of each patient including age, sex, BCC type, location, defect size (cm), type of reconstruction, and esthetic outcome were analyzed. **Results:** All patients responded well to the surgical procedures and experienced no problems associated with anesthesia or any other systemic complications. Postoperatively, no hematomas or wound site infections were observed in any of the patients. There were no cases of graft loss, and all flaps fully survived. **Conclusion:** After BCC is excised, reconstruction of face abnormalities in various facial esthetic units is crucial. Important factors influencing esthetic results include the surgeon's skill level, the patient's preference, and the location and size of the defect. Better results can be achieved with more recent reconstructive techniques, such as freestyle perforator flaps, but expertise from the operator is paramount.

Keywords: Basal cell carcinoma, flap reconstruction, recurrence, wide local excision, wound dehiscence

Introduction

The most prevalent skin cancer, basal cell carcinoma (BCC), tends to target sun-exposed regions like the head and neck. The most popular surgical technique is total excision with a 5-mm margin.[1] Defect closure should be carried out with the minimal possible tension to get the best possible cosmetic and functional results.[2]

However, an excessively large defect may result in excessive tension and an unsatisfactory functional or cosmetic outcome, necessitating flap cover in either local or free flap techniques like skin flaps or grafts.[3]

A local skin flap is the transplantation of full-thickness skin and subcutaneous tissue into a surgical defect from a nearby donor site.[4] A vascular pedicle that stays attached to the donor site sustains the local blood supply.[5]

An advancement flap is a one-dimensional tissue sliding into a defect where the flap's free margin is the wound edge, and incisions are made tangentially to the defect to release adjacent tissue. It is possible to combine this procedure with a rotational flap to maximize the esthetic and functional outcomes because advancement flaps tend to recruit adjacent tissue to approximate and, hence, close the defect in a linear direction. Rotation flaps are used to pivot adjacent tissue around a particular axis to close a primary

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defect, which essentially involves the rotation of the skin into the defect.[4,5]

Even though BCCs and other facial skin malignancies are nearly always curable when diagnosed and treated early, there are a number of therapeutic options available for reconstruction following the removal of the facial tumor, ranging from local or distant flaps for defect resurfacing to full-thickness skin grafts.[6]

Skin grafts require many weeks to stabilize and acclimate to the recipient site and distant flaps do not match well in terms of color and are bulky. Long-term follow-up may result in contracture development.[7] Local fasciocutaneous flaps offer a viable approach for reconstructing facial deformities, with a high success rate and good color and texture match.

Materials and Methods

Aims and objectives

The primary aim of the study was to study the outcomes following the excision of BCC and reconstruction of defects posttreatment in such patients seen in the tertiary healthcare center at our institute, keeping in mind the rising trends in BCC.

Study design

This was a retrospective, descriptive case series study.

Study setting

The study was carried out in the Department of Plastic and Reconstructive Surgery, Institute of Medical Sciences, Banaras Hindu University, and Sir Sunderlal Hospital (a teaching hospital) for 3 years, i.e., from September 2020 to September 2023.

Study population

The medical records of the patients of all age groups and genders who presented to the general surgical wards during the study period and exhibited signs and symptoms suggestive of BCC including those who were transferred from other hospital wards during the study period, were analyzed.

Recruitment procedure

The records containing the detailed history and thorough physical examination of all patients diagnosed with BCC were gathered and analyzed. Information regarding the patient's demographics, the type and before any of the patients received definitive treatment, an incisional biopsy was used to confirm the diagnosis of BCC in every case. There were no localized or distant metastases noted in any of the patients.

Sample size

Over the course of 3 years (September 2020 to September 2023), a total of 28 patients were managed with wide local excision and flap cover. With a range of 45–74 years, there were 10 females and 18 males. Before the surgical management, the diagnosis was confirmed in each patient with a histopathological examination. No evidence of localized or distant metastases was present in any of the patients after a thorough workup.

Surgical procedure

Advancement Flap V-Y

Subcutaneous, sliding V-Y flaps are becoming more and more common. The V-Y flap is a popular option because of the excellent blood supply and homologous tissue located in the same surgical field.

The preoperative marking of the flap and the lesion excision area forms the base of the triangle for V-Y advancement, with the margin of defect. After the tumor is excised and all margins are clear, the V-Y flap is removed and transferred anteriorly using a subcutaneous pedicle to close the incision.

Nevertheless, this flap has its limitations because it is only suitable for relatively minor problems. There might be some notching along the alar rim.[8]

Forehead flap

Patients should be well informed about the two stages of forehead flap repair and their appearance during each stage before surgery. Both the lesion and the proposed excisional margin should be marked.

Simultaneously, the suggested reconstruction flap should also be marked marked. The normal forehead flap and the median or paramedian pedicled forehead flap can be used for surgical reconstruction of the defects. Mucosal or skin grafts should be sutured to the undersurface of the flap to reconstruct the conjunctiva in locations, like the medial canthus or the eyelids.

Since the flaps are stiff enough to sustain and provide support, no cartilage grafts are required to rebuild the tarsal plate.[7,9]

Nasolabial flap

The flap is intended to be an interpolation flap, with the final donor-site closure scar precisely located in the nasal cavity. To allow contraction after surgery, the flap is traced 1 mm larger in each dimension. There is barely 1–2 mm of subcutaneous tissue remaining in the inset's region due to the distally thinning inset.

The donor site is sealed by elevating and extending the skin inferiorly and medially on the surrounding cheeks. The base of the flap is brought closer to the nose when the donor defect is closed before the primary defect is closed, which makes it easier to close the primary defect later on with less stress during wound closure. Three more weeks later, the pedicle is divided.

The cheek is closed by advancement, leaving the remaining pedicle, which functions as a vascular carrier and the final scar precisely in the nasolabial and alar-facial sulcus.

It is possible to restore the natural concavity of the nasofacial sulcus by placing an absorbable suspension suture between the maxilla or nasal bone's periosteum and the flap's undersurface dermis.[8-10]

Mustarde cheek rotation flap

Large deformities of the lower lid can be repaired with great

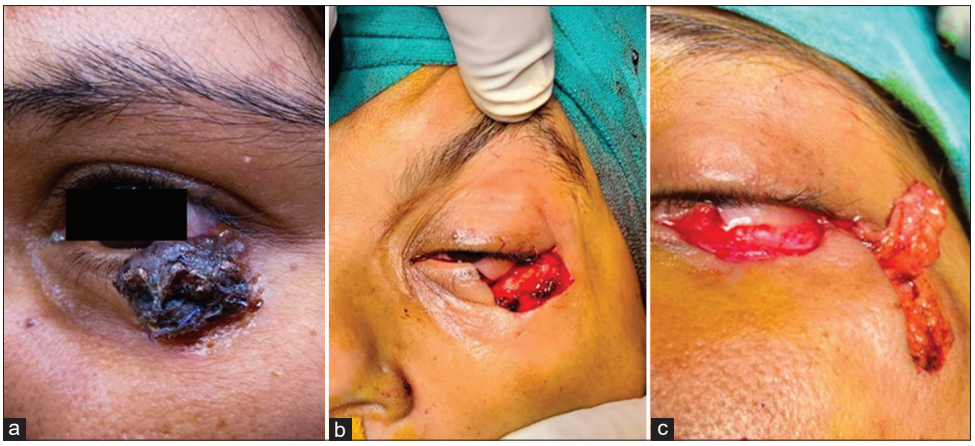

Figure 1: (a) A 32-year female with ulceroproliferative lesion over the lateral canthus of left eye, (b and c) Intraoperative pictures showing excision and reconstruction of the defect with a transposition flap from cheek and buccal mucosa graft

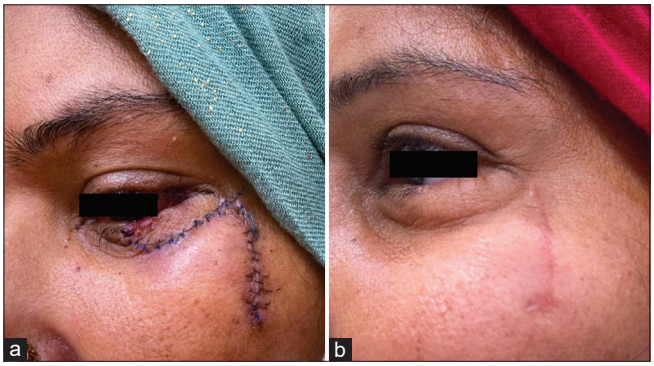

Figure 2: (a) A postoperative day 7 picture showing healed wound, (b) A picture showing completely healed wound one month after the surgery

success and uniformity using the Mustarde cheek rotation flap procedure. However, it does not seem acceptable to insert it into a defect that extends farther medially than the position of the lower punctum when a stump of normal, lash-bearing lid border remains on the advancing edge of the flap.

Either tissue from the medial side must be brought in to meet the lid margin or the margin must be sacrificed. We have developed a modification to address this issue, which fills the space medial to the punctum's location using the triangle of tissue located beneath the defect.[10-12]

Karapandzic flap

This is a superior and inferior labial artery-based sensate axial musculocutaneous flap. It offers good oral competence and can close deficiencies in the upper lip that range from half to two-thirds and in the lower lip that can reach up to three-quarters.

It works best when there is no need for fresh lip tissue in either lateral or central lesions involving the commissure. Although the blood supply is stronger than with the Abbe flap, the result is not as esthetically pleasing. After larger lesions are closed, microstomia may develop because new lip tissue is not recruited.[4,5,9,10]

Ethical considerations

Ethical approval for the retrospective studies is not required or waived off by the Institutional Ethical Board.

Results

After excision, the defects varied in size from 1.5 cm × 2.5 cm to 8 cm × 6 cm. Seven out of the 28 patients had primary closure of the defect postexcision of the BCC; four patients were managed with V Y advancement flaps; four had nasolabial flaps; two had mustarde cheek rotation flaps; and two had Karapandzic flaps; three had median forehead flaps; two had free flaps (one from the anterolateral thigh flap and the second from the recuts muscle free flap); and four had conventional forehead flap covers. The follow up period lasted anywhere from 6 months to 2 years. The demonstration cases have been shown in Figures 1-6.

All patients responded well to the surgical procedures and experienced no problems associated with anesthesia or any other systemic complications. Postoperatively, no hematomas or wound site infections were observed in any of the patients. There were no cases of graft loss, and all flaps survived well without any major complications.

There was a 6-month–2-year follow-up period (18 months). During this time, no patient experienced a recurrence of the tumor or similar lesions. Functionally, the margin was stable and well aligned. There was no associated ectropion observed in the cases where the eyelid was affected. There were no consequences of exposure and sufficient eyelid closure was achieved in patients. Nonetheless, since there was no lacrimal system repair, epiphora was clearly visible. In terms of appearance, there were several color mismatches and no eyelashes.

One of the four V-Y advancement flaps had suture dehiscence at the triangle's apex; this was left to repair secondary with conservative measures. There were no complications with any of the four nasolabial flaps; they were all healthy. Three out of the four median forehead flaps had donor sites that were mostly closed. Split-thickness skin grafts were used to cover

Figure 3: (a) A preoperative picture showing basal cell carcinoma involving whole of the left orbit, (b) An intraoperative showing markings being done, (c) Another intraoperative picture after wide local excision

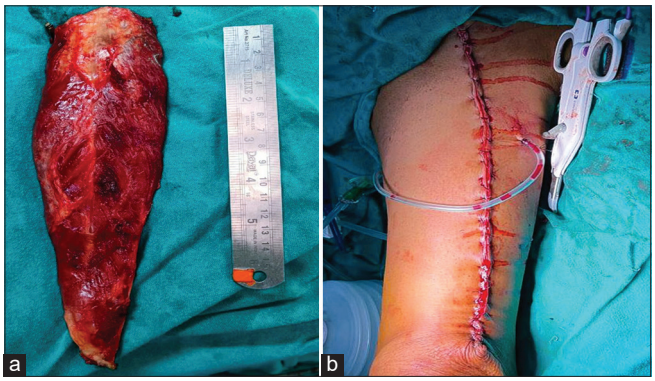

Figure 4: (a) A picture showing free rectus femoris flap taken from the left thigh in order to fill the defect, (b) Donor site i.e., left thigh

the four standard flaps and the remaining two median flaps. Graft loss was not observed.

Due to the bulky appearance of the forehead flaps, one out of four patients who had treatment needed the flaps to be debulked. Three to six months after the reconstructive surgeries, debulking was completed. Every patient experienced good esthetic and functional results.

Discussion

The face is the location where skin neoplasms are most frequently found. The face is the most significant anatomical area in terms of cosmetics. As a result, treating malignant skin tumors on the face is extremely difficult and results in the loss of functional and esthetic units in the course of the progression of malignancy.[9]

R0 resection, or the full removal of the tumor with clear margins on both a macroscopic and microscopic examination, is the aim of BCC excision.[13] Standard excision margins are 4–5 mm from the lesion's affected margins, including any induration that may be present. Determining resection margins can be aided by Moh's micrographic surgery, particularly in esthetically important areas like the canthi and eyelids.[14] If Mohs' micrography is not available, the lesions in these crucial locations are removed with a cautious margin of 3 mm, and the defect is first refilled with a full-thickness graft. If histology reveals a remnant tumor, the reconstruction procedure is modified.[9,14]

In the present study, seven out of the 28 patients had primary closure of the defect postexcision of the BCC; four patients were managed with V-Y advancement flaps; four had nasolabial flaps; two had mustarde cheek rotation flaps; and two had Karapandzic flaps; three had median forehead flaps; two had free flaps (one from the anterolateral thigh flap and the second from the recuts muscle free flap); and four had conventional forehead flap covers. The follow-up period lasted anywhere from 6 months to 2 years.

Furthermore, reconstruction takes into account the restoration of both form and function in addition to esthetics.[11] Early identification and care are the main suggestions to lessen the difficulty of reconstruction surgery required for facial BCC.[10]

In cases where there is skin laxity surrounding minor lesions, primary closure of the postexcisional defects is performed.[15] Anatomical location, lesion size, patient age (skin laxity),

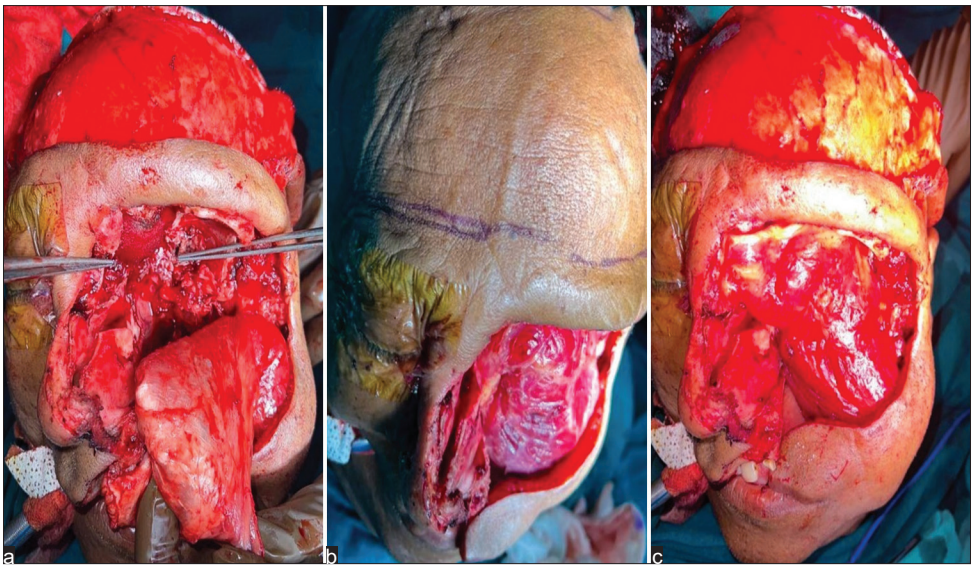

Figure 5: (a-c) Intraoperative pictures showing filling of defect being carried out using free rectus femoris flap taken from the left thigh

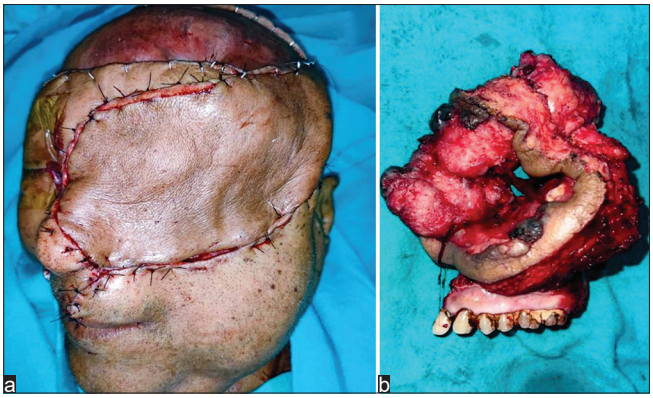

Figure 6: (a) The defect completely filled and covered up using free rectus femoris flap taken from the left thigh via forehead flap in order give outer skin cover, (b) A cut resected specimen following wide local excision of the tumour

patient gender (skin bearing), number of lesions, recurrent lesions, surgical abilities, and patient desire all play a role in determining the best reconstruction technique for face deformities.[14,15]

For very small defects, healing by secondary intention is preferable. Larger defects will require repair using flaps. Severe head and neck lesions will require more involved treatments, such as microvascular flap restoration.[12,16]

The face is composed of esthetic units, which are defined by anatomical landmarks and have comparable features such as color, thickness, amount of subcutaneous fat, texture, and hair present. The forehead, nose, cheek, eyelids, lips, chin, pinna, and scalp are these units. Within the confines of their esthetic, they are reasonably well-defined.[17] The hairline, eyebrows, nasolabial fold, philtrum, vermillion border, and labiomental fold are among the borders that characterize these aesthetic units.[17,18]

These esthetic units are further divided into subunits for esthetic reasons that have imaginary borders. The esthetic unit where a soft-tissue defect is located will determine how it is rebuilt.[18]

For best results, it is best to use tissues borrowed for reconstruction from the same esthetic unit. If a flap reconstruction is envisaged, the location of the defect will also define the vascular basis for reconstruction. A lesion's size in relation to the esthetic unit has a significant role in selecting an appropriate reconstruction.[17,18]

Due to their lax skin, elderly patients make good candidates for flap reconstruction and primary closure. Nevertheless, comorbid conditions including diabetes mellitus, hypertension, heart problems, and co-occurring prescriptions such as aspirin may affect the results in a lot of senior people.

While these flaps tend to be more resilient, younger people with tight skin may require a prolonged flap treatment and undermining to mobilize surrounding tissue for tension-free closure in a particular defect. It is also possible that younger people have higher expectations for cosmetic results.[18,19]

The gender of the patient plays a significant role in the choice of the facial flap. This is due to the fact that when designing a flap repair for male patients, hair-bearing skin, such as the areas around the beard and moustache, needs to be taken into account.[19]

But when it comes to choosing a flap for reconstruction, women have more options. It is evident that treating several lesions in a single facial unit is challenging and requires additional preparation to accomplish the best reconstruction possible. Lesions in more than one face unit in the same patient require unique planning with modifications for each unit, which lengthens surgical periods.

Recurrence of a primary lesion requiring excision presents a larger barrier for reconstruction because fewer reconstructive choices may be available and conventional surgeries may have been performed previously in the previous scenario. Reconstruction is determined by the operator's surgical skills and the patient's wishes.[19,20]

When numerous possibilities exist for a particular defect, patients must give their final approval for a certain style of reconstruction. More difficult reconstructions are best performed by skilled operators. The esthetic results of face unit reconstructions can be evaluated objectively by photography anthropometric techniques or subjectively through 2D photograph.[21,22]

While most facial abnormalities can be treated with local and regional flaps if done methodically, more intricate dissection and reconstruction methods may occasionally be required. To provide the patient with the greatest results, a multidisciplinary team comprising radiologists and plastic surgeons skilled in super microsurgical procedures would need to be involved.[23-25]

Conclusion

Depending on the size and location of the skin tumor, several reconstruction techniques may be needed for the facial defects caused by malignancy. After BCC is removed, reconstruction of face abnormalities in various facial esthetic units is crucial. Important factors influencing esthetic results include the surgeon's skill level, the patient's preference, and the location and size of the defect.

Better results can be achieved with more recent reconstructive techniques, such as freestyle perforator flaps, but operator expertise is required. Studies that compare two or more types of flaps for the reconstruction of a specific facial esthetic unit are limited. It will take further studies with carefully planned randomized trials and a sufficient number of participants to determine the best strategy for flap reconstruction.

Human subjects

Consent was obtained from or waived by all participants in this study and that the procedures followed the guidelines laid down in the Declaration of Helsinki.

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Nil.

Conflicts of interest

In compliance with the ICMJE uniform disclosure form, all authors declare the following:

Payment and service information: All authors have declared that no financial support was received from any organization for the submitted work.

Financial relationships: All authors have declared that they have no financial relationships at present or within the previous 3 years with any organizations that might have an interest in the submitted work.

Other relationships: All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

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