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Case Series

Study of facial reconstruction in basal cell carcinoma

Kesha Chetan Shah*, Sunil Srivastava

Department of Plastic and Reconstructive Surgery, SMS Hospital, Jaipur, Rajasthan, India

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***Correspondence:**
Dr. Kesha Chetan Shah,
E-mail: shahkesha95@gmail.com

ABSTRACT

Head and neck reconstruction presents unique challenges as the defects of this region are often difficult to conceal and the demands on the surgeon's reconstructive skills are greater than they are elsewhere in the body where cosmesis may be less vital and function less specialized. Reconstruction depends on the size as well as the location of the defect. Smaller defects created after excision can be covered by local flaps, however larger defects require a combination of flaps such as rotation, transposition, and cheek advancement. Defects located over and beyond the hairline can be covered by skin grafting as well. We have taken 10 such cases of basal cell carcinoma and explained the various surgical procedures performed on the patients. In 4 of the patients, defect was covered via grafting and in the remaining 6 patients, a combination of forehead flap and cheek advancement flap was done. All the cases have shown excellent functional as well as cosmetic result.

Keywords: Basal cell carcinoma, Reconstruction, Rotation flap, Cheek advancement, Combination

INTRODUCTION

Basal cell carcinoma is the most common skin malignancy in India and is limited to the stratum Basale of epidermis. It is found in the tear flow region of the face and is of four types out of which nodular is the most common. The principle of subunit reconstruction as in the nose or lips is often impractical in the cheek as the subunits overlap, and unnecessary sacrifice of excess tissue may need to be done.[1] Hence the best flap that suits the defect is chosen from the reconstructive armamentarium.[2]

The factors to be kept in mind for cheek reconstruction are the defect's aetiology, site, size, and depth. The site of the defect is important as a 5 mm margin is required for excision which should not distort the normal anatomy and is challenging when defects are near to eyes, nose, and lips. Small-sized defects less than a fourth to a third of the subunit can be closed primarily depending on the skin laxity and the defect site. Moderate-sized defects necessitate recruitment of tissue as local or regional flap as the primary closure may distort the anatomy.[3]

Any described local flaps can be used in the cheek with two principles in mind: incisions should be kept parallel to relaxed skin tension lines, and avoid any tension on other facial structures to prevent secondary deformities such as ectropion on the lower eyelid or distortion of the nose or lip.[4]

Facial local flaps have random pattern blood supply and hence a flap can be harvested to the ratio of 5:1 length to breadth. For defects less than 2 cm, primary closure can be done without tension and if the defect is more than around 2 cm, it may be necessary to recruit tissues from the surrounding cheek in the form of local flaps. The usual flaps used are transposition flap, rotation flap, advancement flap, and bilobed flap and their modifications.[3]

We have taken 10 such cases of bcc with different size and location and studied the outcomes in all the cases.

Aim of the study

The aim of the study was to determine: cosmetic outcome of facial reconstructive surgery in basal cell carcinoma, advantages of using a combination of flaps in facial reconstruction, factors affecting the outcome of facial reconstruction using local flap and skin grafting.

Inclusion criteria

Patients diagnosed with biopsy proven basal cell carcinoma over face with size greater than 2 cm requiring reconstruction were included.

Exclusion criteria

Patients who were not willing for surgical intervention were excluded from this study.

CASE SERIES

Method

This is a prospective study including 10 patients fulfilling the inclusion criteria who were admitted in SMS hospital, Jaipur from a period of 15 January 2023 to 15 November 2023 in plastic and reconstructive surgery department. Facial Reconstruction was performed in these patients after their written consent. Sex, age, cosmetic outcome, advantages, and disadvantages of facial reconstruction were recorded in each case and discussed in the following sections.

In 4 out of 10 patients, superficial spreading type of basal cell carcinoma was diagnosed and the size of the growth was in the range of 7-12 cm. In 6 out of 10 patients, nodulocystic type of basal cell carcinoma was diagnosed with size in the range of 5-10 cm. The former group of patients were treated with skin grafting whereas the latter group underwent reconstruction using local flaps.

Surgery was performed under general anaesthesia in all the patients. Adequate painting with 5% povidone iodine solution and draping was done under strict aseptic precautions. In patients diagnosed with superficial spreading type of basal cell carcinoma, a margin of 5 mm was marked surrounding the lesion and the excision was done removing the layer immediately next to the layer involved. The lesion was located over and beyond the hairline. In these cases, we removed the lesion leaving behind the deep fascia. Adequate haemostasis was achieved. Split thickness skin graft using grafting handle was taken from left thigh and was sutured over the defect created using absorbable vicryl 3-0 suture. Sterile dressing was done over donor site (Figures 1 and 2).

Figure 1: (a) Pre-op, and (b) post-op.

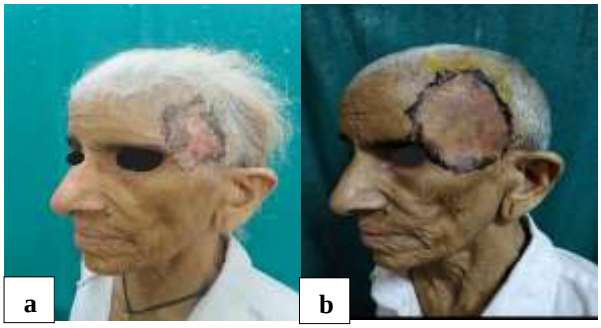

Figure 2: (a) Pre-op, and (b) post-op.

In patients diagnosed with nodulocystic basal cell carcinoma, excision using 5 mm margin surrounding the lesion was done.[5] A total of 6 cases were treated with local tissue reconstruction. After excision the defect was marked and measured using a pattern and then marking was done over the forehead using the same pattern in order to raise a flap. Incision was given over the marking and deepened till deep fascia and flap was raised with the base near the root of the nose. The flap was then placed over the defect making sure not to create any tension along the axis nor to make it too loose to avoid linking. In setting of the flap over the defect was done via suturing.

In 5 out of the 6 cases, defect size was bigger and just the forehead flap was not able to cover the defect without tension. Hence a combination of forehead flap and cheek advancement was done. Advancement flaps are typically random, relying on the subdermal plexus for blood supply.[6] An advancement flap is one dimensional sliding of tissue into a defect where the incisions are made tangentially to the defect to free neighbouring tissue, with the wound edge acting as the free margin of the flap.[7] Incision was made along the inferior border of the defect tangential to the extreme corners and space created in the subcutaneous plane. Flap mobilization was done and flap was pulled towards the defect just so that tension does not develop. For defects which did not get cover by just cheek advancement, forehead flaps were also considered (Figures 3-5).

Figure 3: (a) Pre-op, (b) post-op day 3, and (c) post-op day 21.

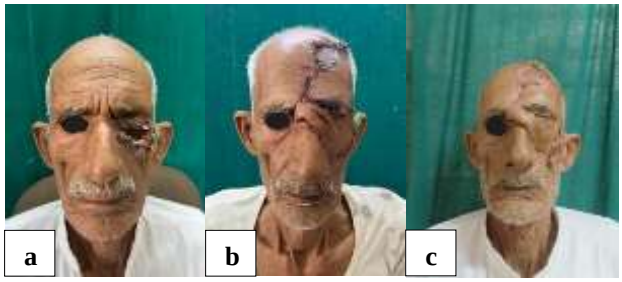

Figure 4: (a) Pre-op, (b) post-op day 3, and (c) post-op day 21.

Figure 5: (a) Pre-op, and (b) post-op.

Observation

We observed that males were more commonly diagnosed with BCC as compared to females (Table 1).

Table 1: Total number of cases and sex distribution.

Gender	N	%
Male	7	70
Female	3	30

Table 2: Age distribution.

Age group (years)	No. of cases	%	Male	Female
31-40	0	0	0	2
41-50	0	0	0	0
51-60	8	80	4	1
61-70	2	20	3	2

In our study the most common age group was 51-60 years followed by 61-70 years (Table 2).

We observed that maximum number of defects were of the size 6-8 cm followed by 8-10 cm (Table 3).

Table 3: Size of the defect.

Range (cm)	Number	Percentage
0-2	0	0
2-4	0	0
4-6	1	10
6-8	4	40
8-10	3	30
10-12	1	10

We observed that most of the lesions were located in the suborbital followed by near the hairline. 6 out of 10 cases had lesions involving lower eyelid and nasolabial region. Out of these 6, 2 of them included medial canthus. 4 out of 10 cases were located in the temporal region (Table 4).

Table 4: Location of the lesion.

Location	Number	Percentage
Suborbital	6	60
Pre auricular	0	0
Buccomandibular	0	0
Temporal	4	40

We observed that in 1 patient with lesion size falling in 4-6 cm size group was treated with forehead flap whereas 5 cases with larger defects were reconstructed using a combination of flaps such as forehead with cheek advancement. In patients with lesion size greater than 7 cm and near hairline were treated with skin grafting (Table 5).

Table 5: Type of procedure performed.

Type	Number	Percentage
Forehead flap	1	10
Forehead flap with cheek advancement	5	50
Skin grafting	4	40

Table 6: Cosmetic outcome.

Type and result	Number	Percentage
Flap		
Okay	6	60
Congested	0	0
Skin grafting take (%)		
100	2	40
95	1	10
80	1	10

We observed that patients treated with skin grafting, there was 100% take result and no any graft loss. Patients treated

with flap surgery, all the flaps were okay and there was no any congestion near the margins (Table 6).

We observed that 3 out of 10 patients had age related comorbidities whereas 7 out of 10 did not (Table 7).

Table 7: Comorbidities.

Comorbidity	Number	Percentage
Hypertension	2	20
DM	1	10
Nil	7	70

DISCUSSION

Any described local flaps can be used in the cheek with two principles in mind: incisions should be kept parallel to relaxed skin tension lines, and avoid any tension on other facial structures to prevent secondary deformities such as ectropion on the lower eyelid or distortion of the nose or lip.[4] The more critical concept in cheek reconstruction is restoring the skin color and texture. Local tissues provide tissue of like texture, color, and hair growth. Thus, whenever possible, local tissue is the first choice in reconstructing the cheek.[4]

In this study, we have taken into consideration 3 major surgical reconstruction for cheek and scalp defects. Forehead flap and cheek advancement for the former group and skin grafting for the latter group were the reconstructive options used in our study. In cases where patients were of elderly age group and with comorbidities where cosmesis was not the major concern, skin grafting was considered and in cases wherein patients were of younger age group without comorbidities and cosmesis was taken into consideration, local tissue reconstruction was given priority. Large zygomatic defects (≥3 cm) often require reconstruction with transposition or rotation advancement flaps.[8]

In 8 out of 10 cases, patients belonged to the age group 51-60 years out of which 6 were suborbital lesions and 2 were temporal region lesions. Out of the 6 suborbital lesions after excision, 5 were reconstructed using a combination of forehead and cheek advancement techniques due to the larger size of the defect lying in the range of 6-10 cms. 1 suborbital basal cell carcinoma case was reconstructed using only forehead flap as the defect created after excision was of smaller size as compared to the rest which did not require a combination of flaps. Patients were followed up after 3,10- and 21-days post-surgery and cosmetic result was unremarkable. There was no congestion of the flap nor the margins. Combination of both flaps proved to be successful in accomplishing the necessary coverage without excessive tension and resultant distortion.[9]

In 2 out of 10 cases, patients belonged to the age group 61-70 years and all the lesions were limited to the temporal region of the scalp. 2 cases belonging in the age group 51-60 years were also temporal lying lesions. All the 4 cases of temporal lesions were treated by excision and reconstructed by skin grafting. Out of the 4 cases, 3 patients had comorbidities. Keeping into consideration all these factors of size, location, age and co-morbidities of the patients, skin grafting was taken to be the best option for reconstruction as the color and texture of the skin would not matter in these cases. Graft take in 50% cases was 100% and cosmetic outcome was unremarkable. Patients were followed up after 3, 10- and 21-days post-surgery and graft take was 100% in 2 cases, 95% in 1 case and 80% in 1.

Disadvantages of local flaps in facial reconstruction are very few and the cosmetic result using local flaps outweighs any other technique. Typical aesthetic deficits for local flaps consist of the bulkiness phenomenon and color mismatch between the reconstructed area and the surrounding skin.[10]

CONCLUSION

From the above study we conclude that facial reconstruction in case of basal cell carcinoma depends on both patient as well as lesion factors. Patient factors include age and patients having comorbidities. Lesion factors include size and location of the defect. A combination of flaps showed excellent cosmetic outcome as compared to single flap however, keeping into consideration all these factors, 4 of the cases required skin grafting. This study showed that skin grafting can be acceptable in selected cases of basal cell carcinoma however not at par with the local flap coverage.

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