Research Article

Patient Satisfaction after Basal Cell Carcinoma (BCC) Excision in Head and Neck Region Followed By Reconstruction with Loco Regional Flaps and Full Thickness Skin Graft

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Abstract: Background: Basal cell carcinoma (BCC) is one of the most frequent malignancies and constitutes nearly 80% of the non-melanoma skin malignancies. There is scarcity of local data regarding the patient satisfaction level in the BCC treatment.

Objective: To assess patient satisfaction after BCC excision in head & neck region followed by reconstruction with loco regional flaps & full thickness skin grafts (FTSG).

Materials and Methods: The present prospective cohort study was performed in Department of Plastic & Reconstructive Surgery Department at Dr. Ruth KM, Pfau, Civil Hospital Karachi, Pakistan during 1st November 2023 to 1st November 2024 after obtaining approval from ethical committee (IRB-3096/DUHS/Approval/2023/420). Post-operatively, patient satisfaction was assessed using four key aspects: skin color, tissue coordination, scar appearance, and skin texture. Each aspect is scored on a scale of 1 to 5, with 1 indicating "Extremely Dissatisfied" and 5 indicating "Extremely Satisfied. Total satisfaction score was calculated by summing four categories and total score of ≥14 was considered as greater patient satisfaction.

Results: Total 215 patients were enrolled into the study with mean age of 50.4 ± 10.0 years. More than half of the patients were males (68.4%) and having lesion of nose (51.6%). Mean lesion size was 1.6 ± 0.6 cm. Half of the patients underwent FTSG reconstruction (50.2%). Satisfaction related to skin color (4.2±0.8 vs 3.2±0.8, p<0.001), skin tissue (3.5±0.9 vs 3.3±0.8, p=0.009) and scarring (3.9±0.7 vs 3.6±0.6, p<0.001) were higher in patients underwent local flap reconstruction than FTSG.

Conclusion: The present study demonstrated that post-BCC excisional defects reconstruction in head and neck region using local-regional flap brings out higher satisfaction level among patients in comparison to full thickness skin graft.

Keywords: Basal cell carcinoma, Plastic & reconstructive surgery, Local flap, Full thickness skin graft, Tumors, Patient satisfaction.

INTRODUCTION

Basal cell carcinoma (BCC) is one of the most frequent malignancies and constitutes nearly 80% of the non-melanoma skin malignancies [1]. These tumors grow slowly which rarely metastasize (metastatic rate less than 0.1 %) and originate from either hair follicles or epidermis. However, these tumors may be locally destructive and highly invasive [1-4]. About two thirds of malignant tumors are found in the head and neck region, particularly on the nose and eyelids because of direct sun exposure (ultraviolet radiation) [3,5]. It is highly prevalent in males and elder age. Cure rate for BCCs is up to 95%, depending on the histological type, clinical characteristics, location, size, growth trend, and comorbidities [1,3,4].

Cryotherapy, radiotherapy, electrodessication, curettage, topical chemotherapy and photodynamic therapy are the successful treatments, particularly in early cases [1,4,6]. Wide local excision with a 0.5 cm safety margin is the standard management.[4, 6]. Full-thickness skin grafts (FTSG) from the anterolateral chest wall can be a good option for large facial skin defects. Benefits include good aesthetic outcomes, color match, and lesser donor site morbidity compared to other donor sites [7]. This method is useful when primary closure is not possible, and the patient does not want a neck scar or does not have enough skin to cover the defect due to a similar injury to the neck [7,8].

The diagnosis and management of BCCs can be distressing for patients and their families, which can affect social interactions, mental health, and other facets of health-related quality of life [7,8]. A particularly distressing effect of treating non-melanoma skin cancers is physical deformity or scarring [9]. Patients are concerned regarding the changes in their facial appearance after reconstructive surgery and outcomes such as quality of life and patient satisfaction are important.

Literature reports contradictory findings regarding FTSG and local flap [10,11]. Skin grafts were found to have better aesthetic outcomes in a study of Sapthavee A, [10] whereas, local flap was effective in achieving aesthetic outcomes in other study [11]. However, there is scarcity of local data regarding the patient satisfaction level in the BCC treatment. Therefore, the aim of current study is to assess patient satisfaction after BCC exci-

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sion in head & neck region followed by reconstruction with loco regional flaps & full thickness skin grafts. By evaluating patient satisfaction, the research aims to provide valuable insights into the effectiveness of different reconstruction techniques, addressing both clinical outcomes and patient well-being. The study's findings have the potential to guide optimal treatment decisions, enhance patient-centered care, and contribute to the existing medical literature by offering a comprehensive understanding of postoperative experiences in BCC treatment and reconstructive surgery.

MATERIALS AND METHODS

The present prospective cohort study was performed in Department of Plastic & Reconstructive Surgery Department at Dr. Ruth KM Pfau, Civil Hospital Karachi, Pakistan. The study was carried out during 1st November 2023 to 1st November 2024 with the approval of hospital ethical committee (IRB-3096/DUHS/Approval/2023/420). A written informed consent was sought from patients prior to enlist them. Patients of age 20-80 years of either gender requiring BCC excision in head and neck region with reconstruction using loco-regional flaps or FTSG were enlisted. Patients with recurrent BCC, metastatic disease, other skin malignancies, BCC reconstruction with regional or free flaps, patients with mental and physical disability or patients taking antidepressants were excluded. Sample size came out to be 212 by taking 72.7% (2) rate for patient satisfaction in BCC reconstruction at 95% confidence interval and 6% margin of error. Sample size was calculated using online available calculator Open-Epi.

All patients underwent routine workup. Locations on the face were categorized as forehead/eyebrow, temple, eyelid, cheek, nose, lip, chin, and ear. Lesions less than or equal to 2cm were subjected to excision biopsy with a 5-mm margin clearance. Lesions more than 2cm were subjected to wedge biopsy first, and once diagnosis was confirmed, wide local excision was carried out with a 5-mm margin clearance. All cases were operated under general anesthesia. Resultant defects were immediately reconstructed using appropriate local flaps or FTSG. Postoperatively, the patients were assessed for any local complications. The patients were followed up for 1 years. Post-operatively, patient satisfaction was assessed using four key aspects: skin color, tissue coordination, scar appearance, and skin texture. Each aspect is scored on a scale of 1 to 5, with 1 indicating "Extremely Dissatisfied" and 5 indicating "Extremely Satisfied." Total satisfaction score will be calculated by summing four categories and total score of ≥14 was considered as greater patient satisfaction.

STATISTICAL ANALYSIS

Data was analysis was done on SPSS version 25. Categorical variables were summated as frequencies and percentages, while numerical variables were presented as mean ± standard deviation or as a median with inter-quartile range (IQR), whichever was relevant. Th Sapiho-Wilk test allowed examination of normality assumption. Satisfaction score were cross-tabulated against various patient characteristics. Independent t-tests and one-way ANOVA were used for comparisons of two and many groups, respectively. For data not following a normal distribution, the alternates chosen were Mann-Whitney U tests an Kruskal-Wallis tests. A two-tailed p-value <0.05 was considered statistically significant.

RESULT

Total 215 patients were enrolled into the study with mean age of 50.4 ± 10.0 years. More than half of the patients were males (68.4%) and having lesion of nose (51.6%). Mean lesion size was 1.6 ± 0.6 cm. Half of the patients underwent FTSG reconstruction (50.2%). Table **1** presents summary statistics for patients' features.

Table 1. Descriptive Statistics for Patients' Sociodemographic and Clinical Profile.

Variables	Frequency	Percentage
Age Group		
30-39 years	39	18.1
40-49 years	65	30.2
50-59- years	69	32.1
60 years and above	42	19.5
Gender		
Male	147	68.4
Female	68	31.6
Site of the Lesion		
Nose	111	51.6
Cheek	49	22.8
Lower eyelid	22	10.2
Upper lip	17	7.9
Forehead	7	3.3
Chin	3	1.4
Ear	3	1.4
Temporal region	3	1.4
Reconstruction Technique		
Full thickness split graft	108	50.2
Forehead	24	11.2
Rhomboid	23	10.7
Nasolabial	16	7.4
Cheek advancement	16	7.4
Biloped flap	13	6.0
Glabelar	9	4.2
Cervicofacial flap	6	2.8

An overall average score for patient satisfaction was 14.9±2.6. Average score for skin color, tissue, scare and skin texture was

3.7±0.9, 3.4±0.9, 3.7±0.7, 4.0±0.8 respectively. Table **2** compares overall score and average score for skin color, tissue, scare and skin texture among different features of patients. Figs. **1, 2** displays patients' condition pre-operatively, intra-operatively and post-operatively.

Table 2. Comparison of Patient Satisfaction Scores among Different Features of Patients.

Variable	Skin Color	Skin Tissue	Scar	Skin Texture	Total Score
Age Group[a]					
30-39 years	4(3-5)	4(3-4)	4(3-5)	4(4-5)	16(13-17)
40-49 years	3(3-4)	3(3-4)	4(3-4)	4(3-5)	13(13-15)
50-59- years	4(3-5)	4(3-4)	4(3-4)	4(4-5)	15(13-18)
60 years and above	4(3-5)	4(3-5)	3(3-4)	4(3.8-4.3)	15(12-18)
p-value	0.005	0.003	0.002	0.288	0.003
Gender[b]					
Male	3.8±0.9	3.4±0.9	3.8±0.7	4.1±0.7	15.2±2.5
Female	3.5±1.1	3.4±0.8	3.8±0.8	3.8±0.9	14.5±2.6
p-value	*0.029	0.663	0.928	*0.024	*0.050
Reconstruction Technique[b]					
Full thickness split graft	3.2±0.8	3.3±0.8	3.6±0.6	4.0±0.7	14.1±2.1
Local flap	4.2±0.8	3.5±0.9	3.9±0.7	4.1±0.8	15.8±2.6
p-value	<0.001	0.009	<0.001	0.411	<0.001

a: Non-normal variables are presented as median (Q3 – Q1), **b:** Normal variables are presented as mean ± standard deviation.* Significant at p<0.05.

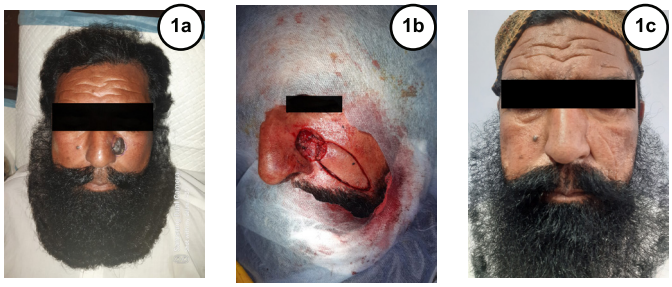

Fig. 1(a-c): 1a: displays pre-operative view of basal carcinoma at nasolabial site, **1b:** displays Intra-operative view and **1c:** shows post-operative view after BCC excision with nasolabial V-Y advancement flap.

Fig. 2(a-d): 2a: displays pre-operative view of basal carcinoma at nasal dorsum, **2b:** displays Intra-operative view and **2c:** shows post-operative view at weeks after reconstruction with full thickness skin graft.**2d:** shows loss of contouring on bony dorsum which is disadvantage of graft.

DISCUSSION

The pathogenesis of BCC is linked to excessive sunlight exposure. High-grade UVR exposures, both continuous and sporadic, may encourage the unchecked proliferation of skin cells [11, 12]. Consequently facial involvement is predominant in BCC cases because of exposure to UV light [13]. The study also demonstrates that facial features which are more prominent in sunlight were commonly affected sites including nose (51.6%) and cheek (22.8%). Other skin areas which are less exposed such as temporal region, ears and chin were much less commonly involved. The most prevalent location of facial BCC, accounting for 25% to 30% of cases due to cumulative exposure, is the nose, according to literature [14, 15].

One of the most important risk factors for the development of BCC is prolonged sun exposure [16]. Sun exposure is higher in men because of their prolonged outdoor activities such as recreational and occupational activities. Moreover, females are mostly covered when going outside and more prone to adopt sun protection behaviors than men due to which men are more affected with negative impacts of ultraviolet radiations. The present study also demonstrates the similar pattern of preponderance of male gender. Although the majority of research on BCC

prevalence suggests that it affects men more frequently, certain studies have found contradictory results, with a preponderance of women [17, 18].

Although there are a number of treatment options for BCC, the most common course of action is extensive local excision. Following surgical excision, skin grafts, free flaps, regional flaps, or local flaps are used for reconstruction [19]. Face BCC reconstruction is difficult because patient happiness, form, function, and clearing all need to be given equal weight. Local flaps are more aesthetically pleasing and have less donor-site morbidity because they resemble the skin's color and texture. In our context, full thickness split graft reconstruction was used to correct problems in half of the patients. The size, position, and involvement of deeper structures are some of the parameters that influence the reconstructive procedure selection. Better color and texture matching led to the selection of flaps [20].

Healthcare organizations and providers can gain valuable insights, such as the effectiveness of the care delivered, by assessing patient satisfaction [21]. When evaluating cosmetic treatments, patients' satisfaction with their look is crucial, and it is becoming more widely recognized that assessing patients' viewpoints is essential to provide patient-centered care and to guide decision-making [22]. In cancer resection surgeries, patient happiness has been the least prioritized. Due to the psychological effects that the reconstruction has on the patient, this is ineffective in any scenario when facial and neck deformities are being repaired. This study explored satisfaction based on four key aspects including skin color, tissue coordination, scar appearance, and skin texture. Different studies used different criteria for evaluating patients' satisfaction among BCC patients and facial skin cancer surgeries [2, 7, 23].

Out of 20, overall score was 14.9±2.5 which depicts patients were satisfied with their aesthetic outcomes. Overall score did not vary among two genders. Nevertheless, score for skin color and texture was lesser among females. The lower score among females make sense as females are more concerned for their appearance and beauty than men. A study evaluating gender-specific impact in the treatment of BCC reported that there was no significant difference among males and females when evaluated patient and observer scar assessment score from patients' point of view. Nonetheless, this study showed that women made three times more dermatologist appointments than men did following a diagnosis of BCC and subsequent surgery, suggesting that males may not be as interested about therapeutic follow-up [24].

In our study, half of the patients underwent flap reconstruction and half were managed with FTSG. Patients managed with flap were likely to be more satisfied than those who under FTSG. Satisfaction related to skin color and tissue match and scarring were higher in patients underwent flap reconstruction. In a related study, Mahadevan *et al.* found that 21.6% of the 88 patients were not happy with the technical quality. Three received flap reconstruction and sixteen underwent SSG among them. Color mismatch in SSG [2] was the cause of dissatisfaction. Another study that is comparable reports on the results of soft-tissue reconstruction in cases where facial post-excisional abnormalities of BCC occur. A total of thirty-two patients' records were examined. All of them had facial BCC surgery and reconstruction. Out of 32 patients, just two had an unacceptable aesthetic result. Two patients were treated: one with SSG and the other with nasolabial flap [25, 26].

LIMITATIONS

The present study was performed in a single public sector institution in Karachi with limited sample size. Moreover the satisfaction was measured only from patients' point of view using self-designed scale. Aesthetic outcomes could also be assessed subjectively using 2D photography or objectively by photography anthropometric methods. Patient surveillance period was not long. Results could be different if patients were followed longitudinally for their postoperative aesthetic satisfaction.

CONCLUSION

The present study demonstrated that post-BCC excisional defects reconstruction in head and neck region using local-regional flap brings out higher satisfaction level among patients in comparison to full thickness skin graft.

AUTHORS' CONTRIBUTION

Seema: Conceptualization, Study Design, Writing draft.

Waqas Sammi and **Sana Shoukat**: Writing Draft, Final approval, final proof to be published.

Faisal Akhlaq Ali Khan: Study design, Critical review and revision the manuscript, Final approval, final proof to be published.

Maryam Noor and **Mujtaba Pervez Khan**: Methodology, Data analysis and interpretation, Final approval, final proof to be published.

FINANCIAL DISCLOSURE

Declared none.

CONFLICT OF INTEREST

Declared none.

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