ORIGINAL ARTICLE ASIAN JOURNAL OF MEDICAL SCIENCES

Study of cutaneous malignancy and various reconstructive techniques in a tertiary care center of West Bengal, India

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Submission: 07-10-2024 Revision: 03-12-2024 Publication: 01-01-2025

ABSTRACT

Background: Skin cancer can be categorized into cutaneous melanoma and non-melanoma skin cancer (NMSC). Common NMSC is basal cell carcinoma (BCC) and squamous cell carcinoma (SCC). Surgical reconstruction following excision of skin cancer is an essential part of treatment plan. **Aims and Objectives**: The aim of the present work is to study the clinical spectrum with age and sex distribution, sites of involvement of cutaneous malignancies and to study the various reconstructive procedures that can be done. **Materials and Methods:** This is a prospective observational study carried out in the department of plastic and reconstructive surgery, NRS Medical College, Kolkata, among patients who presented between January 2021 and June 2024. **Results**: Of the 63 patients, BCC was the most common malignancy (55.6%), followed by SCC (38.1%) and melanoma (6.3%). There was female preponderance. The most common age group was 61–70 years. Head-and-neck areas are most commonly involved. Various local and loco-regional flaps are the primary methods of reconstruction followed by split-thickness skin graft in large defects. **Conclusion**: There is increasing incidence of NMSC with female preponderance. The head-and-neck areas are the most common site of involvement. Skilled plastic surgical reconstruction is an essential part of management.

Key words: Skin cancer; Basal cell carcinoma; Squamous cell carcinoma; Malignant melanoma; Reconstruction

Access this article online

Website: https://ajmsjournal.info/index.php/AJMS/index

DOI: 10.71152/ajms.v16i1.4326

E-ISSN: 2091-0576

P-ISSN: 2467-9100

INTRODUCTION

Cutaneous malignancy is one of the most commonly diagnosed cancers worldwide. The common histological types are basal cell carcinoma (BCC), squamous cell carcinoma (SCC), and melanoma. There is increased prevalence of cutaneous malignancies in the past several years.[1]

Surgical treatment remains the gold standard of treatment as it allows histological analysis and margin assessment.[2,3]

Majority of the patients will require an expert plastic surgical reconstruction following excision of skin cancer to minimize the skin deformity.

Aims and objectives

The aim of the present work is to study the clinical spectrum with age and sex distribution and sites of involvement of cutaneous malignancies and to study the various reconstructive procedures that can be done to minimize the skin deformity and improve the esthetic appearance of the patients.

MATERIALS AND METHODS

The present study is a hospital-based prospective observational study carried out in the department of plastic and reconstructive surgery, NRS Medical College, Kolkata, a tertiary care center in West Bengal, India.

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Total 63 cases were taken in the study from 2021 to 2024. Patients who were lost to follow-up, who were >90 years of age and those who were unfit for surgery were excluded from the study.

Small lesions were treated by excision and primary closure without pre-operative biopsy. Large lesions were treated by wedge biopsy followed by planning for reconstruction.

Contrast-enhanced computed tomography (CT) was done in cases of SCC, melanoma, and recurrent BCC to detect deep invasion, particularly involvement of bone and cartilage. Draining lymph node areas were assessed by CT to detect impalpable lymph node involvement. BCC and SCC were excised with 1 cm margin both circumferential and deep margins. Malignant melanomas were excised with wide margin of >2 cm. In all cases, the resulting deformities were reconstructed using various reconstructive procedures.

RESULTS

The total number of cases under study was 63.

There is increased incidence of cutaneous malignancy from nine cases in 2021 to 23 cases in 2024 (Table 1).

The most common age group of presentation in our study is between 61 and 70 years followed by 51–60 years (Table 2).

The most common skin malignancy in our study is BCC (Table 3).

BCC is more common in females whereas SCC is more common in males (Table 4).

Face and nose are the most common sites of BCC among the affected patients (Table 5).

Whereas leg is the most common site followed by hand and sole among the affected SCC patients (Table 6).

Heel is the most common site of involvement of malignant melanoma in our study (Table 7).

In case of facial reconstruction following excision of BCC lesion, V-Y advancement flap is the most common type of reconstruction (Figure 1). Paramedian forehead flap is the most common type reconstruction of nasal defects (Table 8).

Limberg flap is the second most common type of facial reconstruction following excision of BCC on face (Table 8).

Table 1: Number of cases in each year from 2021 to 24

Year	Number of cases
2021	9
2022	14
2023	17
2024 (Till June)	23

Figure 1: Pre- and post-operative images after excision of basal cell carcinoma face

Figure 2: Trapezius myocutaneous flap was used in the reconstruction after excision of squamous cell carcinoma of scalp

In reconstruction of SCC, defects are most commonly covered by split-thickness skin graft where as other common types of reconstructions are posterior tibial artery based perforator flap, keystone flap, bilateral advancement flap, and rotational flap cover (Table 8).

In scalp reconstruction, rotational flap, bilateral rotational advancement flap, transpositional flap, and trapezius myocutaneous flap are the common types of reconstruction (Figure 2).

Table 2: Age distribution of cutaneous malignancy

Age (years)	20–30	31–40	41–50	51–60	61–70	>70
Number	1	9	8	18	21	6

Table 3: Cancer type distribution (%)

Cancer type	Percentage
BCC	35 (55.6)
SCC	24 (38.1)
Malignant melanoma	4 (6.3)

BCC: Basal cell carcinoma, SCC: Squamous cell carcinoma

Table 4: Gender distribution of cancer

Gender cancer	Male	Female
BCC	14	21
SCC	14	10
Melanoma	2	2

BCC: Basal cell carcinoma, SCC: Squamous cell carcinoma

Table 5: Sites of involvement of BCC

Site	Number
Forehead	2
Nose (Dorsum)	4
Nose (ALA)	2
Face	10
Eyelid	3
Nasolabial fold	2
Post auricular area	1
Scalp	2
Back of trunk	2
Temporal area	1
Eye brow	3
Abdominal wall	1
Medial canthus	2

BCC: Basal cell carcinoma

Table 6: Sites of involvement of SCC

Site	Number
Leg	6
Foot	2
Sole	3
Hand	3
Toe	1
Abdominal wall	1
Nose	1
Gluteal region	1
Back	1
Scalp	3
Thigh	1
Multiple sites in the same patient	1

SCC: Squamous cell carcinoma

In reconstruction of heel defect, following excision of malignant melanoma reverse sural flap is the most common type of reconstruction (Figure 3).

Table 7: Site distribution of malignant melanoma

Site	Malignant melanoma
Heel	3
Toe	1

Table 8: Operative procedures performed

Various operative procedures	No of cases performed
Excision and direct closure	6
Excision and STSG	10
Excision and bilateral advancement flap	2
Excision and rotational flap cover	3
Excision and V-Y advancement flap	6
Keystone flap	2
Reverse sural flap	3
Paramedian forehead flap in nose	5
Limberg flap	3
Transpositional flap	2
Glabellar flap	1
Below knee amputation	1
Superiorly based nasolabial flap	2
PTA-based perforator flap	2
Free ALT flap	1
Trapezius myocutaneous flap	1
Mustarde flap	2
Reverse radial forearm flap	1
Becker flap	1
Toe disarticulation	2
Superficial temporal artery axial pattern flap	1
Auriculotemporal fascial flap with STSG	1
Septal mucosal flap covered with forehead flap in BCC lower eye lid	1
Median forehead flap	1
Facial artery perforator based flap in nasal reconstruction	1
Bilateral rotational advancement flap in closure of scalp defect	2

STSG: Split-thickness skin graft, ALT: Anterolateral thigh, PTA: Posterior tibial artery, BCC: Basal cell carcinoma

DISCUSSION

There is increasing incidence of cutaneous malignancy in our study starting from nine cases in 2021 to 23 cases in 6 months of 2024. As most of the BCC's are slow growing and asymptomatic, a major number of cases presented late with large size and involvement of bone or cartilage that present a reconstructive challenge.

The most susceptible age group is 60–70 years followed by 50–60 years. BCC remains the most common type of skin malignancies with slight female preponderance.

Figure 3: In our study, reverse sural flap was identified as the most commonly used flap after malignant melanoma of the heel

This is similar to the study conducted by Supekar et al.,[4] where BCC (41%) was found to be more prevalent than SCC (30%) and study conducted by Lal et al.,[5] where in BCC was reported in 54% cases compared to SCC in 36% cases. However, our study is in contrast with the study of Sharma et al.,[6] where SCC was the most common histological type (64.8%), followed by BCC (30.4%) and malignant melanoma.

Apart from surgical excision, there are two other treatment options for low risk BCC and SCC. They are electrodissection and curettage and radiation therapy.[7] Electrodissection and curettage use mechanical debridement and electrocoagulation to denature and remove visible tumor a procedure that does not allow for histological assessment and margin analysis. In addition, patients are left to heal by secondary intention that results in unsightly hypopigmented scar and also increased risk of recurrence.[8]

Radiation therapy is reserved for patients who are unfit for surgery. However, radiation therapy can be used as an adjuvant therapy for tumor with positive margins and perineural involvement.[7]

Cryotherapy is a third option for treatment of superficial low risk non-melanoma skin cancer (NMSC) with liquid nitrogen at −50°C, this technique uses repetitive freeze-thaw cycles to locally destroy cancer skin cells. Five-year recurrence rate ranges from 1 to 20%.[9]

Therefore, surgical excision remains the treatment of choice for all cases of NMSC with superior cure rates compared with all non-surgical options.[10,11]

Limitations of the study

This being an observational study has limitations pertaining to it. Long term follow up to see the cancer type and recurrence if any could not be achieved.

CONCLUSION

With the rising incidence of skin malignancies, plastic surgeons must have adequate knowledge regarding diagnosis, staging, and treatment of skin cancer.[12] Treatment of skin cancer requires a multidisciplinary evaluation and coordinated management which may involve an oncologic surgeon, an expert histopathologist, a plastic reconstructive surgeon, and a radiation oncologist.

Reconstruction following surgical excision of skin cancer is dependent on size of tumor, aggressiveness of the tumor, and location of the post excisional defect.[13]

The surgeon must have adequate expertise in reconstructing facial defect as minor irregularities are highly distinguishable.[14]

ACKNOWLEDGMENT

Nil.

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Authors Contribution:
DD- Definition of intellectual content, literature survey, prepared first draft of manuscript, implementation of study protocol, data collection, data analysis, manuscript preparation, and submission of article; **ASJS-** Concept, design, clinical protocol, manuscript preparation, editing, and manuscript revision; **PR-** Design of study, statistical analysis, and interpretation.

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Source of Support: Nil, **Conflicts of Interest:** None declared.