

Original research article

## Role of Adjacent Flaps in Reconstruction of Skin and Soft Tissue Defect after Excision of Skin Tumours

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### Abstract

**Background:** Excision of skin tumours is one of the most common procedure in surgical department. And excision of skin tumours produce skin and soft tissue defect depending upon the size and extent of the skin tumour. Flaps are a better choice when tissue “bulk” is needed to fill contour defect and usually produce better results from a cosmetic stand point because they can provide a better match for skin tone and texture. The merits of the flaps are definitely higher compared to primary closure or skin grafting. Flap technique produce excellent results in facial reconstruction after skin cancer excision.

**Material and methods:** Patients admitted in IPD of department of surgery, ENT, plastic surgery in PMCH, Patna. were considered for the study considering the exclusion and inclusion criteria. A detailed workup was made according to proforma. Patients having skin and soft tissue defects following skin tumour excision were included. Details of cases were recorded including history and clinical examination. Routine and specific preoperative investigations were performed in all patients. Details of reconstructive surgery recorded. Rotational, transposition and advancement flaps were used to reconstruct the defect. A follow-up of patients was done to know the complications and outcome of adjacent flap.

**Results:** 07 patients with small to medium-sized defects (1-6cm) following excision of skin tumours were treated. The age of patients ranged from 30 to 75 years. Of these 07 patients, 04 were men (57.14%) and 03 were women (42.86%). 05 patients had basal cell carcinoma and 02 patients had squamous cell carcinoma. The tumours were located on the face in all the patients. All the flaps survived. We had no complications and the functional and aesthetic outcomes were good. No recurrence of malignant skin tumour was observed.

**Conclusion:** Patients presenting with skin defects following excision of skin tumours were treated with adjacent flap (local flap). The adjacent flap provided a better cosmetic appearance, less scarring, superior aesthetic results and functional normalcy. The complications associated with defect closure with local flap were nil in our study and the flap uptake was 100% in all the cases.

**Keywords:** Flap in skin and soft tissue, Skin Tumours, Excision of skin, Cancer.

## Introduction

Excision of skin tumours is one of the most common procedures in surgical department. And excision of skin tumours produce skin and soft tissue defect depending upon the size and extent of the skin tumour<sup>1</sup>. Flaps are a better choice when tissue “bulk” is needed to fill contour defect and usually produce better results from a cosmetic stand point because they can provide a better match for skin tone and texture<sup>2</sup>. A flap is a piece of tissue with a blood supply that can be used to cover an open wound. A flap can be created from skin with its underlying subcutaneous tissue, fascia, or muscle, either individually or in some combination. A local flap implies that the tissue is adjacent to the open wound in need of coverage. Local flap coverage of a wound is the next higher rung up the reconstructive ladder after a skin graft. The merits of the flaps are definitely higher compared to primary closure or skin grafting. Flap technique produce excellent results in facial reconstruction after skin cancer excision<sup>3</sup>. Less scar tissue is formed following reconstruction. Short operation time, early functionality and fewer outpatient clinic visits. The adjacent flap provides a better cosmetic appearance, less scarring, superior aesthetic results, minimal or no asymmetry of facial features and functional normalcy when compared to primary closure or skin grafting<sup>4</sup>. This study focuses on the role of adjacent flaps (local flaps) and the various types of adjacent flaps that can be used for skin defects following excision of different types of skin tumours and discusses on the merits and demerits of adjacent flaps<sup>5</sup>.

## Objectives

To study about the merits and demerits of the adjacent flap in skin and soft tissue defect following excision of skin tumours. To study about the status and outcome of the adjacent flap in skin and soft tissue defect following excision of skin tumours. To study about the cosmetic advantages of the adjacent flap in skin and soft tissue defects following excision of skin tumours. To study the normalcy of the adjacent flap in skin and soft tissue defects.

## Materials and Methods

07 Patients admitted to department of surgery/plastic surgery/ENT in Patna medical college and Hospital Patna, Bihar. Study duration of Two years. are considered for the study considering the exclusion and inclusion criteria method of collection of data Patients having skin and soft tissue defects following skin tumour excision are included. Details of cases are recorded including history and clinical examination and reconstructive surgery. Routine preoperative investigations are performed in all patients having skin defects following excision of skin tumours.

### Inclusion criteria

Cases presenting with skin defects following skin tumour excision 2) Patients who are fit for surgery 3) Tumour free margins of skin defect

### Exclusion criteria

Patients who are unfit for surgery. Patients who are lost during follow up. Unhealthy skin defects and unhealthy adjacent tissue. Tumour remnant in margins of skin defects. Patients with anaesthetic complications SAMPLING: Patients fulfilling the inclusion and exclusion criteria are taken up for the study. Findings are analyzed using graphs.

## Results

Basic patient data

no of patients = 7

no of skin tumours = 7

Benign= 0

Malignant =7basal cell carcinoma=5 squamous cell carcinoma=2

Range of age (years) 30-75

male : female 04:03

The youngest patient in our study was 30 year old and the eldest was 75 year old.

Distribution of patients by age group

#### DISTRIBUTION OF PATIENTS BY AGE GROUPS

**Table 1: AGE GROUP(YRS)**

DISTRIBUTION OF PATIENTS BY AGE GROUPS		
AGE GROUP(YRS)	NO OF PATIENTS	%
< 20 YRS	0	0
20-35 YRS	1	14.28
35-50 YRS	0	0
>50 YRS	6	85.72
TOTAL	7	100
MEAN AGE	58.57	

The age wise distribution of patients in this study was not uniform. More no of patients was noticed in > 50 years age group. The mean age of patients was 58.57 years. 85.72 % of the patients were in the age group of >50years.

**Table 2: Distribution of patients by sex**

DISTRIBUTION OF PATIENTS BY SEX		
SEX	NO OF PATIENTS	%
MALE	4	57.14
FEMALE	3	42.86
TOTAL	7	100

57.14 % of patients in our study were males, the sex distribution was almost equal in our study.

**Table 3: Distribution of patients by weight**

DISTRIBUTION OF PATIENTS BY WEIGHT		
WEIGHT IN KGS	NO OF PATIENTS	%
< 60 KGS	3	42.86
60 - 80 KGS	3	42.86
> 80 KGS	1	14.28
TOTAL	7	100

The distribution of patients by weight was equal in < 60 kgs and 60 - 80 kgs (42.86%) and lowest in > 80 kgs.

**Table 4: Distribution of patients by site of tumour**

SITE OF TUMOUR		
SITE	NO OF PATIENTS	%
FACE	7	100
TRUNK	0	0
UPPER LIMBS	0	0
LOWER LIMBS	0	0
TOTAL	7	100

100 % of site of tumour in our study were in the face. No lesions were found in other parts of the body

**Table 5: Distribution of patients by area of tumour**

AREA OF TUMOUR SIZE IN CM <sup>2</sup>		
AREA	NO OF PATIENTS	%
< 1 CM <sup>2</sup>	2	28.58
1 - 4 CM <sup>2</sup>	2	28.58
> 4 CM <sup>2</sup>	3	42.86
TOTAL	7	100

In 42.86 % of patients in our study the area of tumour was more than 4 cm<sup>2</sup>. % of patients each had the area of tumour <1cm<sup>2</sup> and 1cm<sup>2</sup> – 4cm<sup>2</sup>.

**Table 6: Distribution of patients by nature of skin tumour**

NATURE OF SKIN TUMOURS		
NATURE	NO OF PATIENTS	%
BENIGN	0	0
MALIGNANT	7	100
TOTAL	7	100

In our study 100 % of patients had malignant skin tumour.

**Table 7: Distribution of patients by type of skin tumour**

TYPE OF SKIN TUMOUR		
TYPE	NO OF PATIENTS	%
BASAL CELL CARCINOMA	5	71.42
SQUAMOUS CELL CARCINOMA	2	28.58
MALIGNANT MELANOMA	0	0
TOTAL	7	100

In our study 71.42 % of patients were basal cell carcinoma present over face. 28.58 % of patients were squamous cell carcinoma. In our study 57.14 % (majority) of patients presented with swelling. The second most complaint was ulcer and or pain which was present in 42.86% of patients. The least complaint was pigmented lesion which was present in 14.28 % of patients.

**Table 8: Distribution of patients by type of flap**

TYPE OF FLAP USED		
TYPE OF FLAP	NO OF PATIENTS	%
ROTATIONAL	5	71.42
ROTATIONAL AND TRANSPOSITION	1	14.29
ADVANCEMENT	1	14.29
TOTAL NO OF PATIENTS	7	100

In our study 71.42 % of patients underwent rotational flap reconstruction, 14.29 % of patients underwent rotational and transposition flap and remaining 14.29 % underwent advancement flap reconstruction.

## DISCUSSION

A flap is a piece of tissue with a blood supply that can be used to cover an open wound. A flap can be created from skin with its underlying subcutaneous tissue, fascia, or muscle, either individually or in some combination. Depending on the reconstructive requirements, even bone can be included in a flap. A local flap implies that the tissue is adjacent to the open wound in need of coverage, whereas in a distant flap, the tissue is brought from an area away from the open wound<sup>6</sup>. Local flap coverage of a wound is the next higher rung up the

reconstructive ladder after a skin graft. In the present study, a brief history of skin tumours, types of flaps, composition of flaps, complications of local flaps was studied. Various clinical features, investigative modalities and management of defects following excision of skin tumours by local flaps was discussed<sup>7</sup>.

Various types of local flaps used for defects following excision of skin tumours, local flap uptake after surgery, cosmetic results after surgery, complications after local flap surgery was discussed. Patients admitted in IPD of department of surgery, ENT, plastic surgery in KIMS, Hubli were considered for the study considering the exclusion and inclusion criteria. A detailed workup was made according to proforma and the following observations made based on the previous tables and graphs. In the present study the median age of patient was 58.57 years. The age group was 30-75 years<sup>8</sup> Most of the cases occurred in > 50 years of age group. The male to female ratio was 4:3. All the skin tumours in our study were malignant and most of the malignant tumours were Basal cell carcinoma. The main symptoms with which the patients presented in our study were swelling, ulcer, pigmented lesion and pain. The duration of symptoms of skin tumours in our study ranged from 2 months to 5 years. In our study most of the skin defects following excision of the skin tumours were in the face region and the defect size following excision of skin tumours ranged from 1 cm to 6 cm and the type of flap used in most of our study was Rotational flap. In our study the surgical margins following excision of the skin tumours of all the cases were free from tumour<sup>9</sup>.

The patients were followed up to 1 year, there were no complications of skin flap like haematoma, infection, wound dehiscence, seroma and necrosis in our study. In spite of comorbidities like diabetes mellitus, hypertension in some patients and in spite of some patients being smokers there were no complications and there was 100 % flap uptake in all the cases<sup>10</sup>. The cosmesis after surgery was good in all the patients. In our study the total no of patients were 7 with male preponderance, median age 58.57 years, basal cell carcinoma was the predominant skin tumour, skin defect size was 1cm-6 cm and type of flap used was rotational flap, Schushart advancement flap and rotation and transposition flap<sup>11</sup>. 100 % flap uptake in all the cases with nil complications after reconstructive surgery was noted. In A.C.SALGARELLI study total no of patients were 286 with female preponderance, age group of 42 – 92 years of age, basal cell carcinoma was the predominant skin tumour, size of defect was 0.5 cm to 3 cm, type of flap used in this study were Bilobed transposition flap for skin defects 0.5 cm to 1.5 cm, Modified nasal flaps (transposition flaps) for skin defects on nasal tip and central and lateral nasal tip and defect size 2 cm in diameter, Nasolabial transposition flap for defects of 1.5 cm to 2 cm involving the alar lobules, Forehead flaps for defects of 2.5 cm to 3 cm<sup>12</sup>. In this study wound dehiscence was present in 1 patient which healed by secondary intention, 3 patients had minimal rim necrosis resulting in irregular scar requiring scar revision and no tumour recurrence. In our study also no post reconstructive complications noted and 100% flap uptake noted in all the cases. The defect in most of the cases was circular which required rotational flap<sup>13</sup>. When a skin defect is closed by primary closure or by using skin grafting complications like scarring, contracture, asymmetry of facial features, functional deficits and poor aesthetic results occurs. When we use adjacent flaps for closure of skin defects there will be minimal or no scarring, no contracture, minimal or no asymmetry of facial features, minimal or no functional deficits and good aesthetic results<sup>14</sup>.

## Conclusion

In the present study 7 patients with skin defects following excision of skin tumours (5 basal cell carcinoma and 2 squamous cell carcinoma) were treated with 5 rotational flaps, 1 rotational and transpositional flap and 1 advancement flap at PMCH Patna, and analysed.

Most common age group of skin tumours were > 50 years of age. In our study skin tumours were occurring almost equally in both the sexes and all the skin tumours were present in the face which is having cosmetic importance in addition to the superior treatment modalities.

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