

# Basal Cell Carcinoma: Clinical Presentation and Management Outcome with Surgical Excision

Muhammad Saaq\*

Department of Plastic Surgery and Burns, National Institute of Rehabilitation Medicine (NIRM), Islamabad, Pakistan

## Authors' Contributions

MS designed the study. He wrote the manuscript. He collected the data and performed analysis. He approved the manuscript.

**PATIENTS' CONSENT:** Informed consents were taken from the patients for inclusion of their photographs in the study.

## Article info.

Received: October 20, 2022

Accepted: January 16, 2023

**Funding Source:** Nil

**Conflict of Interest:** Nil

**Cite this article:** Saaq M. Basal Cell Carcinoma: Clinical Presentation and Management Outcome with Surgical Excision. RADS J. Pharm. Allied Health Sci. 2023; 1 (1):17-24.

## \*Address of Correspondence:

muhammadsaaq5@gmail.com

## ABSTRACT

**Background:** Basal cell carcinoma (BCC) is the commonest skin cancer, accounting for 80% of all cutaneous malignancies. It typically presents with a slow growing painless skin lesion. A variety of surgical and non-surgical interventions are available to manage it.

**Objective:** The current study was conducted to determine the clinical presentation of BCC and management outcome of excision with recommended standard margins (i.e., 5-10 mm safety margins of excision).

**Methods:** This descriptive case series was carried out at the National Institute of Rehabilitation Medicine (NIRM), Islamabad over a period of six years. All patients who presented with primary BCCs during the study period were prospectively included in the study. The exclusion criteria included non-consenting patients, those with recurrent lesions at first presentation, and those with inherited disorders such as the Gorlin syndrome, Bazex syndrome, xeroderma pigmentosa, epidermodysplasia verruciformis and albinism. All primary BCC lesions, measuring less than 1-cm in diameter were excised with 5-mm palpable macroscopic safety margins in all directions including the depth. The safety margins were kept 10-mm for BCCs over 1-cm in diameter, the superficial BCCs of the torso and the morphea form BCCs.

**Results:** Out 113 patients, there were 86 (76.10%) males and 27 (23.89%) females. The age of the patients ranged from 37-83 years with a mean of 54.55±10.63 years. Nodular solid BCC (n=28; 24.77%), superficial BCC (n=21; 18.58%) and nodular ulcerative BCCs (n=17; 15.04%) were the commonest varieties found. Nose (n=47; 41.49%), cheek (n=25; 22.12%) and peri-orbital regions (n=19; 16.81%) were the commonest affected areas. The duration of the BCC lesions varied from 1-7 years with a mean of 3.16±1.71 years. The margin clearance rate after initial excision of the lesions was 92%. The overall recurrence rates after 5-years follow up was 2.65%. There was no in-hospital mortality in this series.

**Conclusion:** BCC was found more frequently among males aged over 50 years. Nose was the most frequently affected anatomic locale, followed by the cheek and periorbital region. Surgical excision with recommended safety margins was associated with tumor free margins in 92% cases. The recurrence free survival was observed in 97.35% of the patients at five years.

**Keywords:** Basal cell carcinoma, Surgical excision, Safety margins. Excision with standard margins, Cutaneous malignancies.

## INTRODUCTION

Cutaneous malignancies constitute one of the most common clinical presentations to the plastic

surgeons. Among these, basal cell carcinomas (BCCs) are the commonest. They can occur anywhere on the body; however they mostly appear on the sun-exposed skin particularly of the face, scalp

and neck. These cancers typically display slow-growth rate and their risk of metastasis is <0.05 %. When neglected for long periods, they invade the underlying tissues and behave as locally destructive lesions.<sup>1-3</sup>

A variety of risk factor is known to predispose to the induction of BCC. Among this, cumulative effect of exposure to sunrays or ultraviolet light is considered to be the most significant one. Genetic predisposition, advancing age, male gender, Fitzpatrick skin types I and II, smoking, immunodeficiency, previous irradiation, infection with human papilloma virus and exposure to arsenic or hydrocarbons are the other risk factors contributing to the development of BCC. Recently the activation of Hedgehog (Hh) signaling pathway is considered to underlie the majority of cases of BCCs.<sup>1,3</sup>

The BCCs are broadly divided into the two categories of circumscribed and diffuse varieties. The circumscribed variety of BCC is further subtyped into the solid nodular, cystic nodular, ulcerative nodular, adenoid BCC, fibroepithelioma of Pinkus, Keratotic BCC and basosquamous carcinoma. The diffuse type of BCC is further subtyped into the superficial BCC, morpheaform BCC, infiltrative BCC, micronodular BCC and eccrine and apocrine epitheliomas.<sup>1,4-7</sup>

The treatment of BCC could be surgical or non-surgical. There are three varieties of surgical excision treatments. These include excision with standard margins, excision with frozen section margins and Mohs micrographic surgery (MMS). The non-surgical therapies include electrodesiccation and curettage, cryosurgery topical 5-fluorouracil, imiquimod 5% cream, photodynamic therapy, immunomodulation, intralesional treatments and radiotherapy. Recently smoothed homologue (SMO) inhibitors have been added to the armamentarium of the agents employed to treat BCC. Agents such as the Vismodegib and sonidegib are oral, small-molecule inhibitors of SMO that inhibit Hh signaling pathway. The ideal treatment option should completely cure the BCC, should produce aesthetic outcome and should have been associated with no recurrence.<sup>1,5-10</sup>

This study was conducted to document the clinical presentation of BCC in our population and evaluate the outcome of surgical excision with recommended standard margins in terms of margin clearance rate after excision and the recurrence rate at 5-years.

## MATERIALS AND METHODS

This descriptive case series was carried out at the Department of Plastic surgery and Burns, National Institute of Rehabilitation Medicine (NIRM), Islamabad over a period of six years. Written informed consent was taken from the patients. The study was conducted after approval from the ethical committee. Being an observational study, it was performed in conformity to the Helsinki's declaration of 1975, as revised in 2008. Anonymity of the patients was guaranteed. Non-probability consecutive sampling was done. All patients who presented with primary BCCs during the study period were prospectively included in the study. The Exclusion criteria included non-consenting patients, those with recurrent lesions at first presentation, and those with inherited disorders such as the Gorlin syndrome, Bazex syndrome, xeroderma pigmentosa, epidermodysplasia verruciformis and albinism.

All the patients were evaluated initially with thorough history, physical examination and baseline investigations. The initial presumptive diagnosis of the BCC was made on the basis of the typical clinical characteristics of the lesions. Incisional biopsies were performed to establish tissue diagnosis where the clinical picture was not clear. Cases where the lesions were small, definitive surgical excisions with standard safety margins were carried out without prior incisional biopsies. In patients with infiltrative and locally advanced BCCs or aggressive histotypes, local extent of the cancer was assessed preoperatively with imaging studies such as MRI or CT scan. All primary BCC lesions, measuring less than 1-cm in diameter were excised with 5-mm palpable macroscopic safety margins in all directions including the depth. The safety margins were kept 10-mm for BCCs over 1-cm in diameter, the superficial BCCs of the torso and the morpheaform BCCs.

The excision specimens were oriented and subjected to histological examination. Biopsies were also taken from the residual tumor bed and margins of the defect after excision of the tumors. Re-resections of the residual defects were performed later on if margins of the specimen were reported positive or if the excision biopsies from the tumor bed or margins showed the presence of tumor cells. As the study followed the protocol of excision with standard margins, initially the excisional defects were temporized with bolster dressings until the complete histology reports were

available. Subsequently, reconstruction of the resultant defects were performed with direct closure, local flap or full thickness skin grafts. Follow up of five years was ensured to document any tumor recurrence.

The demographic profile of the patients, type of BCC, duration of the lesion, site of involvement, duration of hospital stay among the hospitalized patients, margin clearance rate at initial excision, type of reconstructive procedure undertaken, complications encountered, any mortality and recurrence at 5-years were all recorded on a proforma. Figures 1 through 16 show clinical photographs of some of the included patients.



**Figure 1. Nodular BCC on nose:** The lesion displays the characteristic appearance of a well circumscribed nodule with telangiectatic vessels at the base. When the nodule enlarges in size, it tends to develop areas of ulcerations



**Figure 2. Noduloulcerative BCC on the lower eyelid.** The special anatomic locale poses serious reconstructive challenges



**Figure 3. Nodular BCC on tip of nose.** There are telangiectatic vessels visible in the surrounding skin. The lesion apparently looks easy to manage, however oncologic resection results in defects that needs serious reconstructive efforts on part of the plastic surgeon



**Figure 4. Nodular BCC (Cystic variety) with ulceration** on the nasolabial area of the cheek



**Figure 5. Infiltrative BCC in the perialar and nasolabial area of the cheek.** It is diffuse and irregular. The growth has typical fan like extensions along the embryonic cleavage lines. Excision as well reconstruction of the resultant defect poses especial challenges. Subunit reconstruction is adopted for reconstructing such defects





**Figure 6.** Morpheaform BCC on the forehead of an elderly lady. It also called sclerosing or desmoplastic BCC. The scar like infiltrated plaques have poorly defined borders that mimic scars or plaques of morphea



**Figure 9.** Multicentric superficial BCC with pigmentation on the temporal cheek area. The lesion is diffuse with no regularly defined margins in any directions



**Figure 7.** Adenoid BCC of seven years duration on the scalp of a farmer.. Because of the large size, the BCC is monster looking. However; it is a circumscribed variety of BCC. Adequate safety margins of excisions are warranted to avoid recurrence



**Figure 10.** Keratotic BCC on the infraorbital and lateral nasal areas. The lesion has some scaly plaques and areas of atrophic skin. The lesion is circumscribed



**Figure 8.** Keratotic BCC with pigmentation and scaling on the cheek. Telangiectases are visible.. The lesions vary in size, from a few millimeters to several centimeters in diameter. They usually present as a circumscribed, slightly scaly, light reddish patches or thin plaques. May have central atrophy or thin rolled borders



**Figure 11.** Superficial BCC on the lower eyelid area. Excision as well reconstruction of the resultant defect poses especial challenges. The principle of subunit reconstruction is adopted for reconstructing such defects



**Figure 12. Basosquamous BCC on the temporal area. Excision as well reconstruction of the resultant defect poses challenging scenarios**



**Figure 13. Infiltrative BCC on the lateral periorbital area. The lesion has rolled borders. The periphery of the lesion is raised as compared to the central part. Areas of ulceration and fibrosis are visible at some areas**



**Figure 14 Micronodular BCC with pigmentation on the upper lip. Elements of pigmentation and micronodules are visible**



**Figure 15. Superficial BCC on the back**



**Figure 16. Superficial BCC on the hand and forearm. It usually follows a more aggressive course**

## STATISTICAL ANALYSIS

The data were analysed through statistical package for social sciences (SPSS) version 22. Various descriptive statistics were used to calculate frequencies, percentages, means and standard deviation. The numerical data such as age, duration of the lesion, and duration of hospitalization were expressed as Mean  $\pm$  Standard deviation whereas the categorical data such as the subtypes of BCC observed, anatomic locales affected, interventional procedures employed and any complications encountered were expressed as frequency and percentages.

## RESULTS

Out 113 patients, there were 86 (76.10%) males and 27 (23.89%) females. The age of the patients ranged from 37-83 years with a mean of  $54.55 \pm 10.63$  years.

The types of BCCs observed included nodular solid (n=28;24.77%), superficial BCC (n=21;18.58%),



nodular ulcerative (n=17;15.04%), infiltrative BCC (n=12;10.61%), nodular cystic (n=10;8.84%), basosquamous carcinoma (n=8;7.07%), Keratotic BCC (n=6;5.30%), adenoid BCC (n=5;4.42%), and morpheaform BCC (n=3;2.65%), and micronodular BCC (n=3;2.65%).

Anatomic sites of involvement included the nose (n=47; 41.49%), cheek (n=25;22.12%), peri-orbital region (n=19;16.81%), forehead/forehead/ temple (n=7;6.19%), peri-oral (n=5;4.42%), scalp (n=2;1.76%), peri-auricular region (n=2;1.76%), retro-mandibular skin (n=2;1.76%), neck (n=1;0.88%), hand (n=1;0.88%), torso (n=1;0.88%) and lower lip /chin (n=1;0.88 %).

The duration of the BCC lesions at first presentation varied from 1-7 years. The mean duration of the lesion was  $3.16 \pm 1.71$  years.

Out of the 113 patients, majority (n=88; 77.87%) were managed on daycare basis whereas 25 patients (22.12%) needed hospitalization. The duration of hospitalization ranged from 3 days to 9 days with a mean of  $4.60 \pm 2.06$  days.

In our study the margin clearance rate after initial excision of the lesions was 92%. Those with positive margins underwent re-resections of the affected margins before undergoing definitive reconstruction of the resultant defects.

Reconstructive procedures undertaken included coverage with local flaps (n=61; 53.98%), direct closure of the defect (n=25; 22.12%), coverage with full thickness skin grafts (FTSG) (n=20; 17.69%) and coverage with regional flaps (n=10; 8.84%).

The share of postoperative complications observed were wound infection (n=7; 6.19%), partial wound dehiscence (n=4; 3.53%), partial skin graft loss (n=3; 2.65%), and flap tip necrosis (n=2; 1.76%). The overall recurrence rates after 5-years follow up was 2.65%. There was no in-hospital mortality in this series.

## DISCUSSION

The exact incidence and prevalence data regarding BCC are not available in our country as we have no tumor registry in Pakistan. However such data are regularly published in the developed countries. For instance, among the fair-skinned nations, there is 30% lifetime risk of developing a BCC. Also a persistent increase in the annual incidence rates of

BCC has been reported from many countries. There are considerable geographical variations in the incidence of BCC. The highest annual incidence is reported in Australia (1,000/100,000 individuals). This is followed next by the USA and Europe. The lowest incidence rate is reported from the African countries.<sup>3, 11, 12</sup>

In the current study the age range of the affected patients was 37-83 years. In the Western societies, BCC is now increasingly being observed among the relatively younger population aged below 40 years.<sup>13-14</sup>

In the current study we observed predominant involvement of male patients. Our finding conforms to most of the published studies. Predominant affliction of the male gender has also been reported by studies from other countries.<sup>11, 15, 16</sup> More frequent involvement of males in outdoor activities and hence their exposure to intense sunlight may be one possible reason for this higher incidence among males. .

The bulk of our patients had the nodular type of BCC. This conforms to the findings of published literature where the nodular variety has been reported to account for 60-80% of the cases of BCCs. These lesions have the characteristic rolled borders at the periphery. These nodules may be pearly or translucent in appearance and usually have a telangiectatic base.<sup>5, 17</sup>

In this study majority of the patients were managed with surgical excision, keeping a standard safety margin all around the lesion including the underlying deeper subcutaneous tissues. Surgical excision with safety margins is considered to be the one of safest standard therapy for addressing most of the BCCs. Most of the published studies suggest at least 3-5 mm safety margins for undertaking excision of primary BCCs measuring less than 1-2 cm in diameter. Larger safety margins of excision measuring 10 mm are required for the excision primary BCCs over 2 cm in diameter. Similar wider safety margins are recommended for excising superficial BCCs of the torso, recurrent BCCs, and morpheaform BCCs.<sup>1,5, 7</sup>

In our study the margin clearance rate after initial excision of the lesions was 92%. The published studies have reported variable rates regarding margin clearance among their patients. Involved margins have been reported to be found among 4-7% cases in the UK <sup>18, 19</sup> whereas 7% of the excision specimens

were found margin positive in the studies reported from Australia.<sup>20, 21</sup> A varieties of reasons have been presented to account for the positive margins in the excision specimens of BCC. For instance, the subtle and often clinically unpredictable spread of the tumor beyond the macroscopic margins, anatomical locales corresponding to the H-zone of the face, initial learning curve of the surgeon and aggressive histological subtypes.

In this study a recurrence rate 2.65% was observed at 5-years follow up. Several published studies have shared their similar experiences regarding efficacy of surgical excision for managing primary BCCs.<sup>22-24</sup>

Among most studies, nasal BCCs have been reported to be associated with a high rate of recurrence. This may be attributed to the very high-risk location (nose) because of special anatomic features of the nose, a fan-like extension of the cancer cells, perineural invasion.<sup>25, 26</sup>

Majority of our patients presented with BCCs of more than one year duration. When neglected for so long, the tumors tend to become locally invasive. Both surgical excisions with clear margins as well as the subsequent reconstruction of the resultant defects become more challenging. There is dire need to create awareness among our public regarding the sinister course of neglected BCCs. This will ensure early presentation to the plastic surgeons and better cure.

## CONCLUSION

BCC was found more frequently among males aged over 50 years. Nose was the most frequently affected anatomic locale, followed by the cheek and periorbital region. Surgical excision with recommended safety margins was associated with tumor free margins in 92% cases. The recurrence free survival was observed in 97.35% of the patients at five years.

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