

A Case Series Analysis of Basal Cell Carcinoma (BCC): Not the Deadliest but Certainly the Most Destructive Form of Skin Cancer

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Abstract

Introduction: Basal cell carcinoma (BCC) is the most commonly prevalent variety of skin cancer worldwide. The primary aim of the study was to see the epidemiological, demographic profile, and different variants of BCC along with the outcomes posttreatment in such patients seen in the tertiary healthcare center at our institute, keeping in mind the rising trends in BCC. **Materials and Methods:** This is a retrospective analysis of 12 patients in whom facial region-related BCC was surgically excised. The details of each patient, including age, gender, BCC type, location, defect size (cm), type of reconstruction, esthetic outcome, and recurrence, were analyzed. Over the course of 2 years (January 2022–December 2023), a total of 12 individuals were diagnosed with BCC and received treatment. With an average age of 66 years (range: 61–70 years), there were 4 males and 8 females. **Results:** We evaluated the outcomes in the patients who underwent surgical excision for BCC involving the facial region at the surgery department of our tertiary healthcare centre. All our patients responded well to the surgical procedures, i.e., wide local excision of the tumor, and experienced no problems associated with anesthesia or any other systemic complications. Postoperatively, no hematomas or wound site infections were observed in any of the patients. Our patients were followed up for 18 months. During this period, no patient reported graft or flap loss. No patient experienced a recurrence of the tumor or similar lesions. Functionally, the margin was stable and well-aligned. **Conclusion:** The diagnosis and characterization of BCC must be based on the clinical, imaging, and histopathology features of the tumor mass in addition to the patient's characteristics. BCC treatment seeks to achieve the best cosmetic results, especially in critical areas like the face, while minimizing side effects and increasing patient satisfaction. Future research may use the clinical and epidemiological data gathered in this study as a reference.

Keywords: Basal cell carcinoma, malignant skin lesions, nodular type of basal cell carcinoma, pigmented type of basal cell carcinoma

INTRODUCTION

Basal cell carcinoma (BCC), also called rodent ulcer, is the most common type of cancer among white people globally, especially in developed nations.^[1] It is described as “a locally invasive, slowly spreading tumor that arises in the epidermis and in which the peripheral cells typically mimic the basal cells of the epidermis” by the World Health Organization.^[1,2]

It is responsible for 75% of nonmelanoma skin cancer incidents globally. Geographical location and environmental factors have a significant impact on the frequency and distribution of incidence rates. BCC is more common in those who work

outside, such as firefighters, railway engine drivers, farmers, quarry workers, and miners having direct and prolonged exposure to sunlight.^[2,3]

Its prevalence is rising dramatically as a result of increased exposure to ultraviolet B (UVB) radiation as a consequence of the depletion of the ozone layer of the atmosphere. Aside from UVB rays, there are a number of additional factors that include radiation exposure, exposure to arsenic salts,

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chemical carcinogens, burn scars, and radiation scars.^[3] In general, the tumor exhibits nonaggressive behavior and gradual growth. Treatment options for BCC include surgery, radiation, cryotherapy, curettage, and electrodesiccation.^[3] Systemic chemotherapy, laser treatment, and topical use of 5-fluorouracil (5-FU) ointment are alternative, less common therapeutic techniques.^[4,5]

BCC is extremely rare in individuals with darkly pigmented skin; it is more prevalent in white ethnicities. The incidence of BCC has risen by more than 10% annually in white populations in the US, and the lifetime risk of getting a BCC is 30%.^[6] The greatest yearly incidence rate of BCC was reported in Australia (>1000/100,000 person-years), and the lowest rates were observed in some parts of Africa (<1/100,000 person-years) in a systematic study that examined data from 38 different countries globally between 1955 and 2007.^[7] Regarding the yearly incidence rate of BCC in India, no information is known.^[8,9] According to several Indian studies, SCC is more common than BCC, which is in line with results from other cultures with darker skin tones.^[10,11]

The primary aim of the study was to see the epidemiological, demographic profile, and different variants (presentations) of BCC along with the outcomes posttreatment in such patients seen in the tertiary healthcare center at our institute, keeping in mind the rising trends in BCC. The present study was carried out keeping this research question in mind.

MATERIALS AND METHODS

Aims and objectives

The primary aim of the study was to see the epidemiological, demographic profile, and different variants of BCC along with the outcomes posttreatment in such patients seen in the tertiary healthcare center at our institute, keeping in mind the rising trends in BCC.

Study design

This was a retrospective, descriptive case series study.

Study setting

The study was carried out in the Department of General Surgery, Institute of Medical Sciences, Banaras Hindu University, and Sir Sunderlal Hospital (a teaching hospital) from January 2021 to December 2023.

Study population

The medical records of the patients of all age groups and genders who presented to the general surgical wards during the study period and exhibited signs and symptoms suggestive of BCC including those who were transferred from other hospital wards during the study period, were analyzed.

Recruitment procedure

The records containing the detailed history and thorough physical examination of all patients diagnosed with BCC were gathered and analyzed. Before any of the patients received final surgical intervention, an incisional biopsy was

taken prior to confirm the diagnosis of BCC in each case, along with details about the patient's demographics and type of BCC. There were no localized or distant metastases noted in any of the patients.

Sample size

Over the course of 2 years (January 2022–December 2023), a total of 12 individuals were diagnosed with BCC and received treatment. With an average age of 66 years (range: 61–70 years), there were 4 males and 8 females. The complete demographic profile of patients has been shown in Tables 1 and 2.

Ethical considerations

Ethical approval for the retrospective studies is not required or waived off by the institutional ethical board. Informed consent was taken from the patients for usage of the clinical pictures for academic purposes.

RESULTS

The study involved 12 patients with BCC. Among these patients, 4 were males and 8 were females (male-to-female ratio: 1:2). The majority age grouping of affected individuals is 61–70 years, with a mean age of 66 years. An increased risk of BCC in the elderly may result from both aging-related changes in the efficiency of DNA repair mechanisms and cumulative UV radiation-induced DNA damage. In the course of our study, the oldest patient was 72 years of age.

All our patients responded well to the surgical procedures, i.e., wide local excision of the tumor, and experienced no problems associated with anesthesia or any other systemic complications. Postoperatively, no hematomas or wound site infections were observed in any of the patients.

Our patients were followed up for 18 months. During this period, no patient reported graft or flap loss. No patient experienced a recurrence of the tumor or similar lesions. Functionally, the margin was stable and well aligned. Some of the patients with the variants of BCC have been shown in Figure 1 and the HPE of some of some of our patients showing variants of BCC have been shown in Figures 2–7.

A total of five individuals reported that their primary complaint was pain over the lesion, while seven patients reported no symptoms at all except for the ulceroproliferative lesion over the face. Some of the patients had earlier experienced bleeding from the lesion. None of the patients experienced any additional cutaneous or systemic cancers. There was no significant familial history. Nodular lesions and hyperpigmented plaques with a gray-black pigmentation were observed in four patients.

All the patients underwent a careful evaluation for metastasis to the lymph nodes of the head-and-neck region, especially the submental, occipital, and cervical group of lymph nodes. Significant lymph node enlargement was not found in any of the cases.

Metastasis workup by the X-ray of the chest and ultrasonography of the whole abdomen was also done in all patients, with negative results in all patients.

Typically, superficial BCC manifests as erythematous, scaly patches with a fine thread-like border that gradually grows as the patches spread peripherally. The patches typically exhibit crusting, surface ulceration, and occasionally central atrophic scarring.

The nodular type (33.3%) was the most prevalent histopathological variety in our study. The face is the location where skin neoplasms are most frequently found. For the majority of individuals, the face is the most significant anatomical area in terms of cosmetics. Because of this, treating malignant skin tumors on the face presents significant challenges and precludes compromising between functional and cosmetic outcomes and surgical management that is appropriate for the patient's cancer. Nearly eighty percent of our cases, it turned out, had idiopathic BCC.

DISCUSSION

Each of the types in our retrospective analysis was a low-risk histology subtype. None of the individuals in our study who were diagnosed with BCC at an early age showed signs of

recurrence or aggressive subtypes. In our study, patients with BCC at an early age were not found to be more aggressive, in contrast to what has been reported in the literature.^[8,9,11] No significant increase in the diagnosis of BCC in the younger population has been noted in the past 10 years. The histological subtypes were nodular, superficial spreading, and pigmented BCC. Low-risk subtypes were observed in all of our cases, and none of our patients had high-risk subtypes. The nodular type (33.3%) was the most prevalent histopathological variety in our study. These results have been in accordance with the study conducted by Malhotra *et al.*, in which the most common gross appearance was nodular type (64.7%).^[9,12]

BCC is the most frequent malignancy in humans globally and is linked to major morbidity and cost. Its prevalence is also on the rise.^[10,11] Research has continued to advance, improving our understanding of and strategy for treating this disease that



Figure 1: (a) Case A: A 55-year-old male with a hyperpigmented ulceroproliferative lesion of size $2.5 \text{ cm} \times 2 \text{ cm}$ on the right side of the cheek (b) Case B: A 57-year-old male presented with an $8 \text{ cm} \times 6 \text{ cm}$ noduloulcerative lesion extending from the lower eyelid to the upper lip (c) Case C: A 62-year-old female presented with a large ulcerative lesion with rolled-out margins involving the whole of the left orbit

Table 1: The distribution of basal cell carcinoma in the different regions of the face in our patients

Regions involved	Number of cases
Malar/zygomatic region	3
Nose	1
Eyelids	2
Cheeks	3
Forehead	1
Lips	2
Total cases	12 cases

Table 2: Age, gender, lesion dimensions, gross morphological appearance, and site of basal cell carcinoma, along with its types in the patients

Case number	Age (years)	Gender	Lesion dimensions (cm)	Gross morphological appearance	Location
1	32	Female	1.5×1.0	Nodular type of BCC	Eyelids
2	55	Male	2.5×2.0	Pigmented type of BCC	Malar/zygomatic region
3	57	Female	8.0×6.0	Noduloulcerative type of BCC	Nose
4	62	Female	12×8.0	Noduloulcerative type of BCC	Cheeks
5	67	Female	1.0×0.5	Pigmented type of BCC	Malar/zygomatic region
6	50	Male	2.0×1.0	Morpheaform type of BCC	Malar/zygomatic region
7	45	Female	1.0×1.0	Nodular type of BCC	Forehead
8	64	Female	3.0×1.5	Infundibulocystic type of BCC	Eyelids
9	72	Female	2.0×1.0	Noduloulcerative type of BCC	Lips
10	60	Male	1.5×1.0	Focal keratinization consisting of pearls and an outer row of basaloid cells	Cheeks
11	70	Male	2.5×1.5	Superficial type of BCC	Lips
12	46	Female	3.5×1.5	Pigmented type of BCC	Cheeks

BCC: Basal cell carcinoma

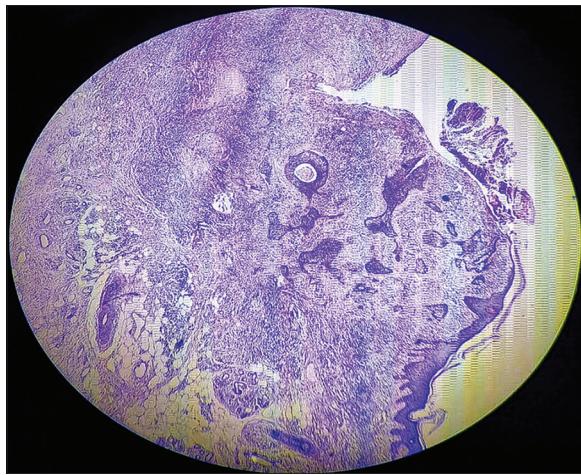


Figure 2: Histopathological examination revealing a soft nodule that resembled a fibroma or papilloma and was unusual for the face. The lesion had a row of basaloid cells and was focally keratinized. It is made up of aggregates of basaloid cells and anastomosing threads encircled by a fibrous stroma, seen in one of our patients

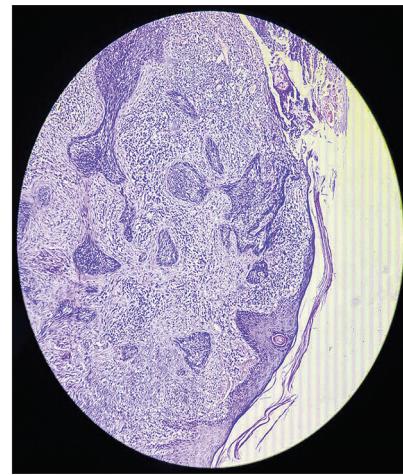


Figure 3: The infundibulocystic variety of basal cell carcinoma, which is unusual and frequently found on the face, can be seen in one of our patients. With minimal stroma, this variation is a tiny, well-circumscribed tumor made up of nests of anastomosing cells. Keratinous material and occasionally melanin are seen in a variety of tiny infundibular cyst-like formations

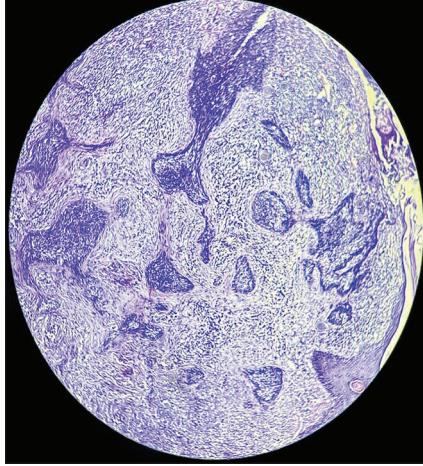


Figure 4: Morphaeform type of basal cell carcinoma seen in one of our patients, a distinct clinical and histopathologic presentation and constitutes a minority of basal cell carcinomas. Although it exhibits tissue degradation similar to the nodular type, it usually has poorly defined borders and appears greater than what is observed during examination. Resection showing histologic control of margins which indicates that the tumor was larger than what might be inferred from the outward look. When managing morphaeform basal cell carcinoma surgically, this may be a typical development

seems to affect everyone. Depending on the size and location of the skin tumor, several reconstruction techniques may be needed for the facial defects caused by malignancy.^[11,12]

After BCC is removed, reconstruction of face abnormalities in various facial esthetic units is crucial. Important factors influencing esthetic results include the surgeon's skill level, the patient's preference, and the location and size of the defect. Idiopathic BCC, which occurs in young individuals without the presence of a condition or risk factor, is believed to be more aggressive.^[9,11,12]

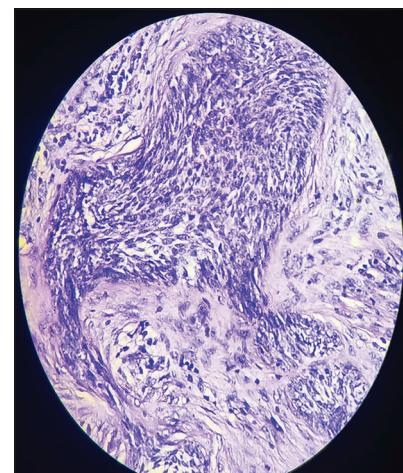


Figure 5: The nodular type of BCC, which accounts for the majority of cases, is depicted with its histopathological examination. The islands of cells that make up nodular BCCs have a randomly arranged core of cells and peripheral palisading. Larger lesions may include ulceration. Five of the participants in our study had this variant of basal cell carcinoma

Treatment for BCC usually does not involve systemic chemotherapy because the cancer rarely progresses to an advanced stage. Immunotherapy, or targeted therapy, is more frequently used in the treatment of advanced BCCs.^[12] The chemotherapy medications – cisplatin, carboplatin, 5-fluorouracil (5-FU), and paclitaxel are most frequently used to treat BCC. Occasionally, two of these medications are given together (paclitaxel and carboplatin, for instance).^[13] Intravenously, or IV, these medications are administered, typically once every several weeks. They frequently ease some symptoms and limit the growth of some malignancies. In certain instances, they may be able to sufficiently reduce tumor size to allow for the use of other therapies like radiation or surgery.^[14,15]

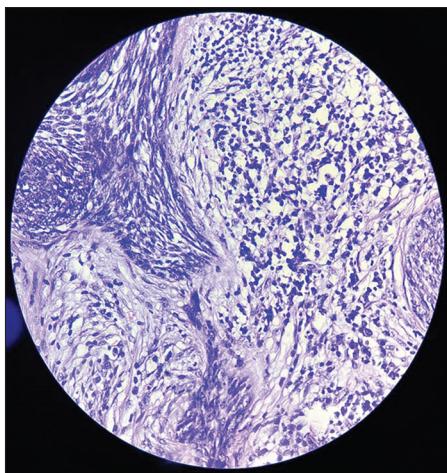


Figure 6: The histopathological examination of the pigmented variation of basal cell carcinoma, which is more common in the superficial, micronodular, or follicular versions and is caused by the presence of melanocytes and melanin mixed with the tumor cells. This variant was seen in three of our patients

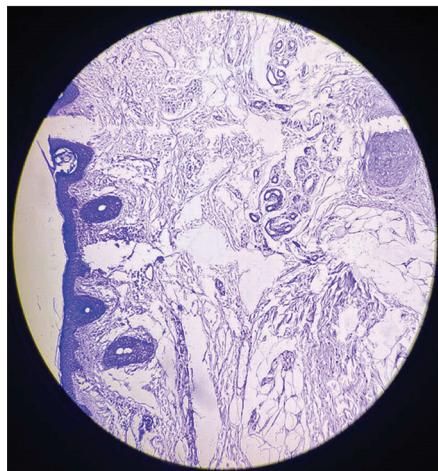


Figure 7: The histopathological examination of the superficial subtype of basal cell carcinoma, which is seen in one of our patients, showing many tiny basaloid cell buds descending from the epidermis without any dermal penetration

It is crucial to comprehend the risk factors linked to basal cell cancer to develop preventative measures and support early detection of the disease. The development of BCC is influenced by exposure duration and intensity, especially during early infancy and adolescence, in addition to the cumulative UV dose and skin type. The usage of indoor tanning facilities and recreational sun exposure are factors that contribute to the development of BCCs. BCC occurrence may also result from UV light therapy. A positive family history of BCC, sporadic severe sun exposure as demonstrated by past sunburns, pale skin, particularly red hair, ease of sunburning (skin types I or II), and blistering sunburns as a youngster are additional risk factors for the formation of BCC.^[9,13-15]

Early identification and treatment of early-onset BCC are made easier by knowledge of the condition.^[16-18] Consequently,

in the differential diagnosis of skin lesions in the younger population, BCC should be included.^[16,19] In addition to UV light exposure, 20% of BCC cases occur on skin that has not been exposed to the sun. Additional causes of BCCs include exposure to arsenic, ionizing radiation, immunosuppression, and genetic predisposition. Xeroderma pigmentosum, basal cell nevus syndrome (also called Gorlin syndrome), Bazex-Dupré-Christol syndrome, and Rombo syndrome are a few hereditary diseases linked to an elevated incidence of BCCs. While food does not appear to be associated with risk, smoking appears to be associated with risk in females. Moreover, we must remember the associated risk factors and symptoms when dealing with early-onset BCC.^[19,20]

Better results can be achieved with more recent reconstructive techniques, such as freestyle perforator flaps, but operator expertise is required.^[21] Pulsed dye laser is becoming a more common treatment option for BCC in candidates who are not surgical candidates. It has benefits, including superior esthetic results and office-based functionality. Although the data so far show encouraging clearance rates, more research is required to evaluate its effectiveness in relation to lesion location, size, and histologic subtype. Furthermore, to comprehend recurrence rates, long-term follow-up data are required.^[22]

Studies that compare various types of flaps for the reconstruction of a specific facial esthetic unit are limited. It will take further studies with carefully planned randomized trials and a sufficient number of participants to determine the best strategy for flap reconstruction. Researchers in the future may use the clinical and epidemiological data gathered in this study as a reference.

CONCLUSION

To choose the best course of action and produce the best outcomes with the longest disease-free intervals and lowest recurrence rates, the diagnosis and characterization of BCC must be based on the clinical, imaging, and histopathology features of the tumor mass in addition to the patient's characteristics. BCC treatment seeks to achieve the best cosmetic results, especially in critical areas like the face, while minimizing side effects and increasing patient satisfaction. Future research may use the clinical and epidemiological data gathered in this study as a reference. This study emphasizes the manner in which BCC is increasing significantly while showing female preponderance. We highlight the significance of promoting awareness among general practitioners, public health professionals, and the general public about the importance of early detection and treatment of lesions to reduce functional and cosmetic consequences and expenses.

Limitations of study

Despite encountering various variants of BCC, the study was carried out for a limited time, i.e., 2 years, affecting the sample size, and the follow-up period was also 18 months, resulting in the unavailability of data regarding the recurrence of such lesions, which the authors found could have been the possible

limitations for the present study. Another limitation that we will add is that we were unable to include any molecular analysis for BCC.

Human subjects

Consent was obtained from or waived by all participants in this study and that the procedures follow the guidelines laid down in the Declaration of Helsinki.

Financial support and sponsorship

Nil.

Conflicts of interest

In compliance with the ICMJE uniform disclosure form, all authors declare the following:

Payment and service information: All authors have declared that no financial support was received from any organization for the submitted work.

Financial relationships: All authors have declared that they have no financial relationships at present or within the previous three years with any organizations that might have an interest in the submitted work.

Other relationships: All authors have declared that there are no other relationships or activities that could appear to have influenced the submitted work.

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