SAS Journal of Medicine
Abbreviated Key Title: SAS J Med
ISSN 2454-5112
Journal homepage: https://saspublishers.com

OPEN ACCESS

Radiation Oncology

Management of Facial Basal Cell Carcinomas: Experience of the Radiation Oncology Department at Mohammed VI Teaching Hospital in Marrakech

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DOI: https://doi.org/10.36347/sasjm.2025.v11i05.027 | **Received:** 01.04.2025 | **Accepted:** 07.05.2025 | **Published:** 19.05.2025

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Abstract **Original Research Article**

Introduction: Basal cell carcinoma (BCC) is the most common type of skin cancer. Its severity lies in the risk of involving critical facial structures, as well as the potential functional and aesthetic sequelae. Facial involvement is a risk factor for recurrence. ***Methods:*** This is a retrospective study conducted in the radiotherapy department of the Mohammed VI University Hospital in Marrakech, during the period from January 2019 to December 2023. ***Results:*** Our study included 24 patients. The average age was 65 years, with a range from 17 to 83 years. A clear male predominance was noted, with a sex ratio of 2.3. Sun exposure was the main predisposing factor, found significantly in 70% of our patients, linked to outdoor occupations. The median time between the onset of the first symptoms and the first consultation was 4 years. The macroscopic appearance was dominated by ulcerative-budding lesions in 55% of cases. Histological examination confirmed the predominance of nodular BCC (55% of cases) followed by infiltrating BCC (25% of cases). Recurrence occurred in 35% of cases. Therapeutically, the tumors were unresectable in 15% of cases, and operated on with tumor margins in 65% of cases. Radiotherapy was indicated in 25% of patients, adjuvant in 84% of cases, and exclusive in 16% of cases, at a dose ranging from 60 to 66 Gy. Palliative chemotherapy was indicated in 15% of patients. ***Conclusion:*** Surgical excision with clear margins remains the gold standard treatment for basal cell carcinoma. Radiotherapy has an important role in cases of incomplete excision, recurrent BCC, or unresectable tumors. Improving results requires prevention (sun protection, public information) and early detection of lesions.

Keywords: Basal cell carcinoma, Facial involvement, Radiotherapy, Surgical excision, Recurrence.

INTRODUCTION

Basal cell carcinoma (BCC) is the most common type of cancer in the world. BCCs have low mortality but can cause significant morbidity primarily through local destruction [1]. Clinically, BCCs tend to appear on sun exposed skin, especially on the face and neck [2]. Several factors play important etiological roles in the development of BCC, among which exposure to the ultra- violet (UV) radiation in sunlight is the most critical environmental cause. Pathobiologically, activation of the Hedgehog (HH) signaling pathway underlies the majority of BCCs and serves as a therapeutic target [3].

Despite the frequency of BCC, few randomized studies have been conducted to define the optimum treatment [4]. BCC treatment is primarily directed at local control given its low metastatic potential. This study aims to describe the epidemiological, clinical, and therapeutic characteristics of basal cell carcinomas managed in the Oncology-Radiotherapy Department at Mohammed VI University Hospital in Marrakech.

METHODS

We conducted a retrospective study from January 2019 to December 2023 in the Radiation oncology department of Mohammed VI University Hospital in Marrakech. Data were collected from medical records using a Microsoft Excel worksheet.

Inclusion criteria

- Basal cell carcinoma confirmed by histopathological examination,
- Tumor located on the face.

Exclusion criteria

- Other histological types of skin cancer,
- Incomplete or insufficient medical records.

RESULTS

A total of 24 patients were included in this study. The mean age was 65 years, ranging from 17 to 83 years. There was a male predominance, with a sex ratio of 2.3. Regarding occupational distribution: 35% were farmers, 30% were housewives, 20% were day laborers, 15% were industrial workers. The majority of patients (65%) were from rural origins.

Identified risk factors included: Chronic sun exposure, reported in 95% of cases, often linked to outdoor occupational activities. Precancerous conditions were noted in two patients: one case of xeroderma pigmentosum and one case of basal cell nevus syndrome (Gorlin syndrome).

The diagnostic delay ranged from 4 months to 10 years, with an average of 3 years between the onset of symptoms and diagnosis. Recurrent lesions were observed in 65% of cases.

Regarding the anatomical distribution of the lesions, they were located as follows:

Nasal region: 35%, Inner canthus: 20%, Temporal region: 25%, Cheek: 10% and other facial sites: 10% Lesion characteristics: Single lesion was found in 75% of patients, while 25% had two or more lesions. Lesion size: Larger than 5 cm: 25%, between 2 and 5 cm: 66%, smaller than 2 cm: 9%.

Histological examination confirmed the diagnosis of basal cell carcinoma in all patients. The distribution of histological subtypes was as follows: Nodular subtype: 50%, sclerodermiform subtype: 25%, Infiltrative subtype: 19%, metatypical subtype: 6%.

Surgical excision was performed in 85% of patients. Among these, histological examination of surgical margins showed: Clear margins in 35% of cases, positive margins in 65% of cases. Among the patients with involved margins, surgical re-excision was performed in 50% of cases.

30% of patients were treated with radiotherapy: In an adjuvant setting in 66% of these cases and as an exclusive treatment in 34%. The delivered dose ranged from 60 to 66 Gy, using a conventional fractionation of 2 Gy per session.

Palliative chemotherapy was indicated in 15% of patients, primarily in the context of advanced or unresectable disease.

DISCUSSION

Basal cell carcinoma (BCC) is the most common skin cancer, especially affecting chronically sun-exposed areas like the face. In our series, the mean age was 65 years, with a male predominance, aligning with existing literature that associates BCC with cumulative sun exposure and aging [5,6]. The predominance of rural origin patients and high reported exposure to sun reinforce the occupational and environmental role in BCC development. Indeed, both genetic and environmental factors are involved in the occurrence of basal cell carcinomas.

The main intrinsic risk factor is the patient's skin type. Genodermatoses such as xeroderma pigmentosum and basal cell nevus are the second major risk factor. The main extrinsic factor is exposure to solar or artificial ultraviolet A and B rays.

The nasal region was the most frequently involved, followed by the temporal region and the inner canthus. These facial areas are classified as high-risk zones due to their complex anatomy, frequent sun exposure, and higher recurrence potential [7]. Moreover, a long diagnostic delay (mean 3 years) and a high rate of recurrent lesions reflect delayed consultation, often due to limited awareness or access to dermatologic and oncologic care.

Histologically, the nodular subtype was most common, followed by sclerodermiform, infiltrative, and metatypical subtypes. These latter forms are more aggressive, frequently associated with subclinical extension and higher recurrence rates [8,9]. The distinction between four main histological subtypes is recommended: Nodular, infiltrating, superficial scleroderma-like basal cell carcinoma: metatypical BCC is a rarer form. There is another rare form: mixed or composite BCC. Superficial and nodular forms often have sharper boundaries and therefore have a better prognosis. Sclerodermiform and infiltrative forms have higher recurrence rates.

Surgical excision remains the gold standard for the treatment of BCC, offering high healing rates when complete resection is achieved [10]. The goal is to achieve immediate cancer resection with maximum preservation of function and aesthetics. To achieve this, the resection margins must be sufficient. Many recent guidelines, including those from the National Comprehensive Cancer Network (NCCN) and the European Dermatology Forum (EDF), recommend standard excision with lateral margins of 3–5 mm for low-risk BCCs and >5 mm for high-risk lesions [11,12].

In our study, complete (tumor-free) margins were achieved in only 35% of cases, with 65% showing involved margins. Among these, only 50% underwent re-excision. Incomplete excision is associated with a

recurrence rate of approximately 30%, particularly in cases with aggressive histological subtypes or when located in high-risk areas such as the nose, eyelids, or periorbital region [13].

When standard surgical margins are difficult to obtain due to anatomical constraints or functional considerations, Mohs micrographic surgery (MMS) is now considered the technique of choice, especially for recurrent, infiltrative BCCs [14]. Mohs micrographic surgery (MMS) is a technique that allows intraoperative histological control of the resection margin. It has the advantage of providing a very satisfactory aesthetic and functional result. The 5-year tumor recurrence rate after MMS is 10 times lower than all other methods [15]. Unfortunately, this technique was not available in our setting.

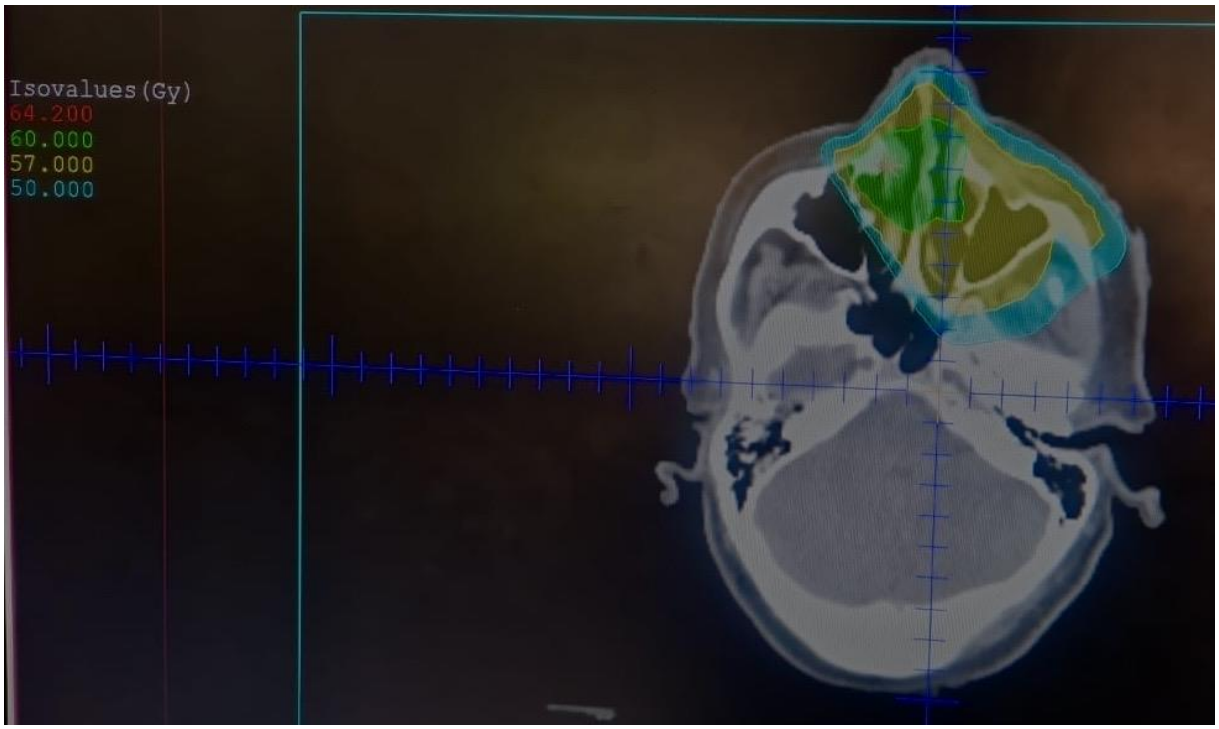
In the absence of MMS, wide local excision remains a valid option, but it requires close postoperative histological evaluation and, if necessary, early re-excision in case of positive margins.

Radiotherapy played an essential role in our cohort, administered to 30% of patients. It was indicated either in an adjuvant setting, mainly for cases with positive margins or aggressive histology, or as exclusive treatment when surgery was contraindicated due to age, comorbidities, or functional and aesthetic concerns.

The doses delivered ranged from 60 to 66 Gy, fractionated at 2 Gy per session, in accordance with international recommendations for definitive or adjuvant treatment of BCC [16]. Several studies have demonstrated that radiotherapy offers excellent local control rates, often exceeding 90% in small to medium-sized tumors, and is particularly effective for elderly patients or lesions in high-risk facial areas where surgery would be disfiguring [17,18].

Radiotherapy remains a non-invasive, organ-sparing, and effective option, especially when delivered with modern techniques such as conformal 3D planning or electron therapy, which were not detailed in our series but are increasingly used in clinical practice to optimize dose distribution and limit toxicity to adjacent structures. According to the NCCN recommendations, radiation is mainly indicated in case of positive margins where surgical re-excision is impossible or significant perineural involvement.

Finally, 15% of patients received palliative chemotherapy, typically in locally advanced or unresectable disease. This emphasizes the importance of early and multidisciplinary intervention to avoid progression to inoperable stages.



Dosimetry of a nasal basal cell carcinoma treated with 3D conformal radiotherapy

CONCLUSION

The incidence of basal cell carcinoma is steadily increasing. Surgical excision with clear margins remains the gold standard treatment for basal cell carcinoma. Treatment of basal cell carcinoma requires close collaboration between the dermatologist, plastic surgeon, and radiation oncologist to determine the benefit of additional treatment.

We emphasize the role of prevention (sun protection, public information) and early detection of lesions.

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