ejpmr, 2025, 12(1), 13-16

SJIF Impact Factor 7.065

EUROPEAN JOURNAL OF PHARMACEUTICAL AND MEDICAL RESEARCH

www.ejpmr.com

Research Article

ISSN 2394-3211

EJPMR

ASSESSMENT OF PROGNOSTIC FACTORS FOR THE RECURRENCE OF SKIN BASAL CELL CARCINOMA

Farah Adib Maarouf*[1] and Firas Moulhem[2]

[1]Master Degree in Plastic and Reconstructive Surgery, Tishreen University Hospital, Lattakia, Syria.
[2]Supervisor, Professor in Plastic and Reconstructive Surgery, Tishreen University Hospital, Lattakia, Syria.

***Corresponding Author: Farah Adib Maarouf**

Master Degree in Plastic and Reconstructive Surgery, Tishreen University Hospital, Lattakia, Syria.

Article Received on 07/11/2024 **Article Revised on 27/11/2024** **Article Accepted on 18/12/2024**

ABSTRACT

Study Aim: to determine the prognostic factors for recurrence of basal cell carcinoma, which enables determining the optimal surgical procedure to reduce the rate of recurrence, achieve recovery in a short period of time, allow the patient to return to work, and reduce the medical costs incurred due to repeated surgical procedures. **Material and Methods:** The study was conducted in the Reconstructive Surgery Division at Tishreen University Hospital, from June 2023 to June 2024. The study was designed prospectively, and at the end of the study, 32 patients were included. After taking the patient's consent, his clinical history, and filling out his form, preparations were made for the surgery, the necessary consultations and tests were performed, then a complete excision of the lesion was performed with an appropriate safety margin, and the samples were sent for histological analysis. The appropriate reconstructive method was chosen after the histopathology result was issued. **Results:** The number of patients in our study was 64 patients, where the number of male patients was 42, representing 56.63%, and the number of female patients was 22, representing 34.37% of the patients visiting the Department of Reconstructive Surgery at Tishreen University Hospital. The average age of patients in our research was 68.14 years with a standard deviation of 12.34. The youngest age treated in our research was 11 years and the oldest was 87 years. Most of the lesions were located in the head and neck regions at a rate of 62.50%, followed by the trunk and lower extremities at a rate of 25.00% and 12.5%, respectively. The vast majority of the study patients reported a history of previous sunburn, whether once or several times, as their number reached 29 patients out of 32. Sick, with a rate of 90.63%. The largest percentage of lesions were of the superficial and nodular types, at 27.38% and 41.68%, respectively, while the least common type was the infiltrative type, which was present in 7.14% of the total lesions studied. The average lesion size in our research was 1.46 cm with a standard deviation of 0.33. The size of most lesions ranged between 1 and 2 cm, while the smallest percentage were lesions whose size exceeded 2 cm. Recurrence occurred within 9 months in 20 cases out of 84 resected cases, a rate of 23.80%. We did not find a relationship between recurrence and age or diameter of the lesion, while there was a relationship between recurrence and the histological type, as most of the recurrent lesions were of the infiltrative, micronodular and fibrosin histological type. We found a relationship between recurrence and the proximity of neural structures, where 75% of cases adjacent to neural structures relapsed compared to 18.42% of cases not adjacent to neural structures, in addition to that there was a relationship between recurrence with long term sun exposure, and sun burns. **Conclusion:** Infiltrative, micronodular and fibrosin patterns, improper cutting edges, adjacent nerve structures, long term sun exposure, and sun burns are considered factors that predict recurrence in basal cell carcinoma tumors.

KEYWORDS: Reconstructive surgery, basal cell carcinoma, recurrence, prognostic factors.

INTRODUCTION

Basal cell carcinoma (BCC) is the most prevalent form of skin cancer in humans, yet it constitutes less than 0.1% of cancer-related fatalities.[1] BCC typically develops on sun-exposed skin, exhibits a slow growth rate, and rarely metastasizes (0.028–0.55%).[1] The distribution of lesions is as follows: (1-2) head and neck (85%), trunk and extremities (15%), and lesions on the penis, vulva, and perianal skin are exceedingly rare. In some patients, BCC may arise in non-sun-exposed regions due to factors such as exposure to arsenic, tar, coal, paraffin, specific industrial oils, and radiation. Additionally, BCC can be associated with scarring from burn scars, xeroderma pigmentosum, past trauma, vaccination scars, or tattoos.[1-3]

The primary factors contributing to basal cell carcinoma include: exposure to radiation, particularly prolonged sunlight exposure; genetic mutations; oral arsenic exposure; immunosuppression; xeroderma pigmentosum;

basal cell carcinoma syndrome; a history of non-melanoma skin cancer; and skin type, with albinism identified as a significant risk according to the Fitzpatrick skin type scale. Other contributing factors include Rombo syndrome, alcohol consumption, and hydrochlorothiazide use.[3-4-5]

Diagnosis often requires a skin biopsy, typically a scraping biopsy, which is instrumental in determining the histological subtype of BCC.[1]

The 5-year recurrence rate is approximately 5%, contingent on the histological type and treatment modality. For primary (previously untreated) lesions treated with Mohs micrographic surgery, the recurrence rate is about 1%. A critical factor influencing recurrence is the surgical excision margin.[6]

There are various histological types of BCC, each possessing unique characteristics and behavior, including nodular, infiltrating, squamous, and superficial.[2-7]

METHODS AND MATERIALS

This study was conducted in the Department of Plastic and Reconstructive Surgery at Tishreen University Hospital from June 2023 to June 2024. It was designed both prospectively and retrospectively by reviewing records of patients diagnosed with basal cell carcinoma who underwent tumor resection. A total of 64 patients were included.

After obtaining informed consent, clinical histories were documented, and a questionnaire based on a previous foreign study was utilized to assess sunlight exposure.[8] Preparations for surgery included necessary consultations and analyses, followed by complete resection of the lesion with an adequate safety margin, and samples were forwarded for histological evaluation. The appropriate restorative method was selected based on pathology results.

The study sample comprised 64 patients, resulting in a total of 84 lesions, as some patients presented multiple lesions. Follow-up on recurrence was conducted within 9 months' post-surgery, extending to 3 years for retrospective analysis.

Statistical Analyzes was done using IBM SPSS version 26, with significance when P value <0.05.

RESULTS

The sample consisted of 64 patients, with 42 males (65.62%) and 22 females (34.38%). The average age was 68.14 years, with a standard deviation of 12.34. The youngest patient was 11 years old, while the oldest was 87 years old. Among the patients, 40 had lesions in the head and neck region (62.50%), 16 had lesions in the trunk and upper extremities (25.00%), and 8 patients had lesions in the lower extremities (12.50%).

The average duration of sun exposure was 674.32 weeks, with a standard deviation of 50.41. The most common exposure category ranged between 250 and 1000 weeks (40 patients), while the least frequent category involved exposure exceeding 1000 weeks (4 patients). A significant majority, 90.63% (58 out of 64 patients), reported a history of prior sunburn, while 9.37% did not.

The most prevalent lesion types included superficial (27.38%) and nodular (41.68%), while infiltrative lesions occurred in only 7.14% of cases. The average lesion size was 1.46 cm with a standard deviation of 0.33; most lesions ranged between 1 and 2 cm (42 patients), whereas 14 lesions exceeded 2 cm, and 28 lesions were smaller than 1 cm. Eight lesions (9.52%) were adjacent to nerve structures, while 76 lesions (90.48%) were not. Tumor recurrence occurred in 20 patients (37 cases), with 14 cases (16.67%) of recurrence within 9 months out of 84 resected cases. In 70 cases out of 84, recurrence did not occur (83.33%). Recurrence within 3 years was noted in 23 cases (32.86%) out of 70 resected cases, while 47 cases (67.14%) remained recurrence

The highest recurrence rate was observed for lesions situated in the head and neck, particularly in the facial region, reaching 37.50%. In contrast, the recurrence rate for lower extremity lesions was 25.00%, and for trunk and upper extremity lesions, it was 18.75%. This indicates that lesions in the head and face are more prone to recurrence in patients with basal cell carcinoma. Although no statistical significance was found in the relationship between recurrence and the site of the lesion, the greatest proportion of recurrent patients was in the head and neck area. The mean age of patients with recurrent lesions was 68.11 years, while that of patients with non-recurrent lesions was 68.78 years. A comparison of these averages revealed no statistically significant difference, indicating no correlation between patient age and basal cell carcinoma recurrence. The highest relapse rate occurred in infiltrative lesions, with a recurrence in 66.67% of cases, followed by 60% in micronodular and fibrosin types. The superficial type exhibited a relapse rate of 43.47%, while the nodular type had the lowest at 31.42%. Thus, infiltrative lesions demonstrate a greater tendency to relapse compared to other types, as evidenced by our findings.

The relapse rate was notably higher in patients with increased sunlight exposure, reaching 75% in individuals exceeding 1000 weeks of exposure, while the lowest rate of 25% was observed in patients with limited sunlight exposure, exhibiting statistical significance. Furthermore, a significant majority of recurrent patients reported a history of prior sunburn, with 32.75% of recurrent patients having such a history, while only one patient, representing 16.67% of the total, had a relapse without a history of sunburn (p=0.037).

In terms of proximity to nerve structures, 6 out of 8 lesions adjacent to these structures experienced relapse at

a rate of 75.00%, whereas 14 out of 76 non-adjacent lesions experienced relapse, resulting in a rate of 18.42%. Hence, proximity to nerve structures appears to be a predisposing factor for recurrence.

The mean diameter of recurrent lesions was 1.71 cm, in comparison to 1.42 cm for non-recurrent lesions. A statistical comparison of these means did not reveal a significant difference, indicating no relationship between lesion diameter and basal cell carcinoma recurrence.

DISCUSSION

Our study comprised 64 patients, with 42 males (65.63%) and 26 females (34.37%) who consulted the Department of Reconstructive Surgery at Tishreen University Hospital.

The mean age of patients was 68.14 years with a standard deviation of 12.34, which aligns with the age group most susceptible to basal cell carcinoma. The youngest patient was 11 years old and the oldest was 87 years old.

The majority of lesions, at 62.50%, were located in the head and neck regions, areas most exposed to sunlight, followed by the trunk at 25.00% and lower extremities at 12.50%. A significant majority of study participants (90.63%) reported a history of prior sunburn, with 58 out of 64 patients indicating exposure.

The predominant types of lesions were superficial and nodular, comprising 27.38% and 41.68%, respectively; conversely, the infiltrative type was the least common, accounting for only 7.14% of all lesions studied.

The average lesion size in our study was 1.46 cm with a standard deviation of 0.33, with most lesions measuring between 1 and 2 cm; fewer lesions exceeded 2 cm in size.

Tumor recurrence was documented in 20 patients (37 cases), with 14 recurrences occurring within 9 months and 23 recurrences out of 70 resected cases noted within 3 years (32.86%).

No correlation was found between recurrence and age, as the age averages were similar for recurrent and non-recurrent patients, and the majority of patients were from the older age group. Additionally, no correlation with lesion diameter was identified, as most lesions fell within the 1-2 cm range.

The highest recurrence rates were associated with head and neck lesions, particularly in the facial area. Although no statistical significance was found regarding the relationship between recurrence and lesion site, the higher percentage of recurrence in these regions may reflect the greater incidence of lesions located there, which obscured the significance of the statistical analysis.

A relationship between recurrence and histological pattern was identified, with a greater percentage of relapsed lesions exhibiting the infiltrative histological pattern, followed by micronodular and fibrosin types. These patterns generally have poorer prognoses, contributing to higher relapse rates.

Patients with increased sunlight exposure exhibited higher relapse rates, noted at 75% among those exceeding 1000 weeks of exposure. This elevated rate can be attributed to chronic sunlight exposure, which increases the risk of initial carcinogenesis and exerts a long-term impact on recurrence rates.

Moreover, a significant correlation was found between recurrence and prior sunburn history, as previous skin burns can induce cellular level alterations in division and reproduction processes, posing a risk for future infections and recurrences.

Additionally, a relationship between relapse and the proximity to nerve structures was established, with 75% of cases demonstrating relapse in lesions adjacent to these structures. This may be attributable to potential infection or transmission to nearby nerve structures, providing an explanation for the higher relapse incidence in these patients.

Comparison with Armstrong's Study[9] Conducted at the University of New England, the study design differed from ours as it was a retrospective study focusing on lesions located in the facial area, involving a total of 331 cases.

Both studies concurred that infiltrative and micronodular histological patterns are linked to high recurrence rates, and both identified the nodular pattern as the most prevalent form of basal cell carcinoma (BCC). The mean age of participants was comparable in both studies. Armstrong's study identified inadequacies in the cutting edges and cutting depth as predisposing factors for recurrence. Our study addressed this issue by repeating surgeries until intact cutting edges were achieved. In our study, injuries were more prevalent in males, whereas Armstrong's study reported a higher prevalence in females.

Comparison with Borledo's Study[10] Conducted at the University of Thessaloniki, the design of this study was also retrospective, concentrating on facial lesions, with a total of 531 cases.

Both studies agreed that the nodular pattern is the most common type of BCC, and the mean age of participants was closely aligned. Borledo's study indicated that inadequacies in cutting edges and cutting depth were significant predisposing factors for recurrence. Our study addressed this issue by ensuring surgery was repeated until intact cutting edges were achieved. The majority of injuries were observed in males in both our study and

Borledo's; however, the percentage was higher in the latter.

Comparison with Athanasios' Study[11] Conducted at the University of Thessaloniki, the study design differed from ours, as it was a cohort study examining patients over a span of seven years, concluding with a total of 1062 patients.

Both studies coincided in their findings that the nodular pattern is the most common form of BCC, with average ages being comparable. Athanasios' study highlighted inadequacies in cutting edges and cutting depth as factors contributing to recurrence. This issue was resolved in our study by repeating surgeries until healthy cutting edges were reached. Additionally, Athanasios' study noted that the most aggressive histological patterns are associated with recurrence, though specific aggressive histological patterns were not detailed. The majority of injuries were in males in both studies, with the percentage being higher in Athanasios' study compared to ours.

CONCLUSIONS

Patients treated surgically for basal cell carcinoma should visit the plastic and reconstructive surgery clinic every six months for three years to monitor for recurrence, and it is essential to increase awareness regarding the importance of daily sunscreen application and reapplication every two hours while exposed to sunlight, applicable to all age groups, we also recommend expanding safety margins for patients identified as having a high risk of recurrence.

ACKNOWLEDGEMENT

The authors have nothing to acknowledge.

REFERENCES

1. Cameron MC, Lee E, Hibler BP, Barker CA, Mori S, Cordova M, et al. Basal cell carcinoma: Epidemiology; pathophysiology; clinical and histological subtypes; and disease associations. *J Am Acad Dermatol*, Feb. 2019; 80(2): 303-317.
2. Cameron MC, Lee E, Hibler BP, Giordano CN, Barker CA, Mori S, et al. Basal cell carcinoma: Contemporary approaches to diagnosis, treatment, and prevention. *J Am Acad Dermatol*, Feb. 2019; 80(2): 321-339.
3. Kim DP, Kus KJB, Ruiz E. Basal Cell Carcinoma Review. *Hematol Oncol Clin North Am*., Feb. 2019; 33(1): 13-24.
4. Loh TY, Rubin AG, Brian Jiang SI. Basal Cell Carcinoma of the Dorsal Hand: An Update and Comprehensive Review of the Literature. *Dermatol Surg*, Apr. 2016; 42(4): 464-70.
5. [Guideline] Dandurand M, Petit T, Martel P, Guillot B. Management of basal cell carcinoma in adults Clinical practice guidelines. *Eur J Dermatol*, Jul-Aug. 2006; 16(4): 394-401.
6. [Guideline] National Comprehensive Cancer Network. NCCN Clinical Practice Guidelines in Oncology: Basal Cell Skin Cancer. NCCN. Available at. Version 1. 2022 — November 17, 2021; Accessed: February 14, 2022.
7. Romao-Correa RF, Maria DA, Soma M, et al. Nucleolar organizer region staining patterns in paraffin-embedded tissue cells from human skin cancers. J Cutan Pathol, 2005 May. 32(5): 323-8. Ozyazgan I, Kontas O. Previous injuries or scars as risk factors for the development of basal cell carcinoma. Scand J Plast Reconstr Surg Hand Surg, 2004; 38(1): 11-5.
8. Zhu GA, Raber I, Sakshuwong S, Li S, Li AS, Tan C, Chang AL. Estimation of individual cumulative ultraviolet exposure using a geographically-adjusted, openly-accessible tool. BMC Dermatol, Jan. 20, 2016; 16: 1.
9. Linus T.D. Armstrong, Mark R. Magnusson, Michelle P.B. Guppy, Risk factors for recurrence of facial basal cell carcinoma after surgical excision: A follow-up analysis, Journal of Plastic, Reconstructive & Aesthetic Surgery, 2017; 70(12): 1738-1745. ISSN 1748-6815, https://doi.org/10.1016/j.bjps.2017.04.006.
10. Bourlidou, E., Vahtsevanos, K., Kyrgidis, A. et al. Risk factors for local recurrence of basal cell carcinoma and cutaneous squamous cell carcinoma of the middle third of the face: a 15-year retrospective analysis based on a single centre. Eur J Dermatol, 2019; 29: 490–499. https://doi.org/10.1684/ejd.2019.3643
11. Athanassios KYRGIDIS et al. Clinical, histological and demographic predictors for recurrence and second primary tumours of head and neck basal cell carcinoma. A 1062 patient-cohort study from a tertiary cancer referral hospital, Eur J Dermatol, 2010; 20(3): 276-82.