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ORIGINAL ARTICLE

A Cross-Sectional Assessment of Basal Cell Carcinoma Recurrence after Single-Stage Excision and Reconstruction in a Balochistani Population

KAMAL UDDIN KHAN[1], FARZANA ABDULLAH[2], HIFZA BASHIR[3]
[1]*Associate Professor, Head of Department of Burns & Plastic Surgery, Bolan University of Medical & Health Sciences Quetta*
[2]*Consultant Dermatologist, Cosmetico cosmetic surgery clinic Islamabad*
[3]*House Officer, Arif Memorial Teaching Hospital, Rashid Latif Medical College, Lahore*
Correspondence to: Kamaluddin Khan, Email: dr.kamalafridi.kk@gmail.com, Cell: 03116961814

ABSTRACT

Background: The majority of non-melanoma skin cancers worldwide are basal cell carcinomas. While metastasis is not common with BCC, its spread within tissues and tendency to return cause a lot of concern for those treating it. The recurrence rate is affected by characteristics of the tumor, how far the excision is from the tumor edges, where the tumor is located and the way the area is reconstructed.

Materials & Methods: A cross-sectional study conducted from June 2022 to January 2023. Histologically confirmed BCC, age ≥18 years, undergoing single-stage excision and reconstruction were included. Incomplete excision records, follow-up <6 months, immunosuppressed patients were excluded. Recurrence was defined as histologic confirmation of BCC at the same site.

Results: Most tumors (85/120, 71%) were on sun-exposed sites of the head and neck (face 68%, scalp 3%), with 35% on the nose. Others involved the trunk (15%) or extremities (14%). Mean tumor diameter was 15.2 ± 6.8 mm. Surgical margins averaged 4.5 ± 1.2 mm. Final pathology showed clear margins in 108 cases (90%) and involved/close margins in 12 (10%). Reconstruction methods were: primary closure (n=60, 50%), local flap (36, 30%), and skin graft (24, 20%).

Conclusion: Our study highlights an 8.3% recurrence rate of BCC post single-stage excision in the Balochistani population, with higher recurrence linked to positive margins, morpheaform subtype, and larger tumor size.

Keywords: Basal Cell, Reoccurrence, Baluchistan, Single Stage Excision

INTRODUCTION

The majority of non-melanoma skin cancers worldwide are basal cell carcinomas. While metastasis is not common with BCC, its spread within tissues and tendency to return cause a lot of concern for those treating it[1]. The recurrence rate is affected by characteristics of the tumor, how far the excision is from the tumor edges, where the tumor is located and the way the area is reconstructed[2]. Around the world, doctors tend to excise low-risk BCCs once and straight away reconstruct the area for the best protection and aesthetic results. Still, when cancer returns after one operation, both patients and surgeons must deal with the difficulties, so more research on the subject is necessary[3,4].

The commonest skin cancer, BCC, spreads slowly in nearby tissue but rarely affects other parts of the body[5]. Even though surgery is frequently effective, this condition is likely to come back, especially after only one round of surgery and reconstruction[6]. Single-stage procedures are commonly recommended for their advantages in morbidity and appearance, but they have to consider oncologic safety along with cosmetic and function[7]. It is found globally that between 4% and 10% of breast cancer cases can recur, depending on the location of the tumor, what it is like and individual patient factors.

Because of their distinct genetic, environment and cultural features, the Balochistani population in Pakistan may produce unique clinical forms of BCC[8]. Higher UV exposure at work and living in certain places, waiting too long for medical help and restricted use of quality dermatologic and cancer services may all lead to more cases of skin cancer returning[9]. Moreover, since BCC in these individuals is most often found on the face, surgery to achieve clear margins needs care since face-area surgery can impact how the person looks[10].

While a number of studies have looked at the recurrence of BCC in many populations, research on the Balochistani population is rare. Since skin types, how much sun patients get, the types of healthcare systems involved and patient discipline with follow-up activities can vary by region, it is important to have different treatment plans for different populations. Variations in surgical ability and the different techniques surgeons may employ, for example primary closure or complex skin grafts, play a role in the long-term outcome of a surgical procedure. Few statistics on BCC recurrence after single-stage excision in Pakistan, especially in the Balochistani population, are available[11]. Tumor types may differ regionally, some tumors are hard to detect and the availability of top-quality care matter for the results. It is important to study disease risk in Balochistan, as its population alone can explain much about recurrence. The aim is to analyze BCC recurrence after single-stage excision and reconstruction to help with local strategies and direct treatment for Baloch patients. Examining the rate at which patients suffer from recurrence has helped us to recognize high-risk people and adjust surgical approaches. It fills in a data gap for this region and supports the creation of future investigations.

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MATERIALS AND METHODS

A cross-sectional study conducted at Bolan Medical Complex, Quetta, from June 2022 to January 2023. Patients diagnosed with BCC undergoing single-stage excision and reconstruction, with clear documentation of tumor characteristics and margin status were enrolled for the study. Histologically confirmed BCC, age ≥18 years, undergoing single-stage excision and reconstruction were included. Incomplete excision records, follow-up <6 months, immunosuppressed patients were excluded. A sample size of 120 patients, based on previous regional studies with an estimated recurrence rate of 10% and a 95% confidence level (12) by employing WHO sample size calculator.

Demographic data (age, gender), tumor characteristics (size, location, histologic subtype), surgical details (margin status, reconstruction type), and recurrence within 6–12 months were recorded. Recurrence was defined as histologic confirmation of BCC at the same site. All the histopathology were performed by the consultant histopathologist.

Statistical Analysis: Data analyzed using SPSS version 26. Descriptive statistics were computed and were analyzed for percentages and frequencies. Chi-square and logistic regression assessed associations between recurrence and variables. $p<0.05$ was considered significant.

RESULTS

A total of 120 patients met inclusion criteria (mean age 57.8 ± 13.5 years; 72 males and 48 females). Table 1 summarizes their demographics and tumor data. Most tumors (85/120, 71%) were

on sun-exposed sites of the head and neck (face 68%, scalp 3%), with 35% on the nose. Others involved the trunk (15%) or extremities (14%). The majority were nodular subtype (n=72, 60%); other subtypes included superficial (18, 15%), pigmented (12, 10%), morpheaform/infiltrative (12, 10%), and micronodular (6, 5%) as depicted in pie chart (figure 1).

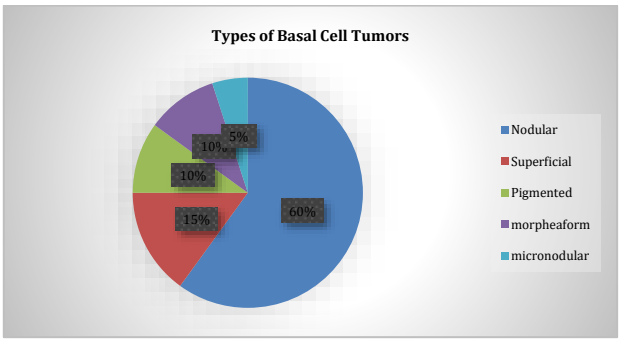

Figure 1: Types of Basal Cell Carcinoma undergoing resection in Surgery.

Mean tumor diameter was 15.2 ± 6.8 mm. Surgical margins averaged 4.5 ± 1.2 mm. Final pathology showed clear margins in 108 cases (90%) and involved/close margins in 12 (10%). Reconstruction methods were: primary closure (n=60, 50%), local flap (36, 30%), and skin graft (24, 20%).

Table 1: Patient and Tumor Characteristics

Variable	n (%)	Mean ± SD (if applicable)
Total patients	120	
Mean age		57.8 ± 13.5 years
Sex (Male/Female)	72/48	
Tumor location (head/neck)	85 (71%)	
Tumor subtype (nodular)	72 (60%)	
Mean tumor diameter		15.2 ± 6.8 mm

During a median follow-up of 14 months, 10 patients (8.3%) developed local recurrence (mean time to recurrence: 10.4 months). Univariate analysis (Table 2) showed a significantly higher recurrence rate among tumors with involved margins (4 of 12, 33%) versus clear margins (6 of 108, 5.6%; p<0.001). Other factors associated with recurrence included morpheaform/infiltrative subtype (p=0.02) and larger tumor size (mean 21.5 mm in recurrent vs 14.7 mm in non-recurrent, p=0.01). Age, sex, and reconstruction type (flap/graft vs primary) were not significantly related to recurrence (p>0.1 for each). Notably, none of the patients receiving Mohs surgery (none in this series) had recurrences. Logistic regression confirmed positive margin status as the strongest predictor (adjusted OR ~9.5, 95%CI 2.4–37.8, p=0.001).

Table 2: Recurrence and Associated Factors

Factor	Recurrence Rate (%)	p-value
Positive margin	33%	<0.001
Clear margin	5.6%	<0.001
Morpheaform subtype	High	0.02
Tumor size ≥20mm	High	0.01

DISCUSSION

Our cross-sectional study of 120 patients undergoing single-stage excision and reconstruction for basal cell carcinoma in the Balochistani population revealed a recurrence rate of 8.3%, aligning with international benchmarks. Factors significantly associated with recurrence included positive surgical margins (p<0.001), morpheaform subtype (p=0.02), and tumor size ≥20mm (p=0.01). These findings underscore the importance of complete excision and vigilant follow-up, particularly in high-risk subgroups.

The observed recurrence rate is lower than in other Pakistani series (e.g., Karachi study, 19.2%) but higher than in some Asian cohorts (e.g., Hong Kong series, 5.5%)[12,13]. This may reflect differences in surgical expertise, early detection, and genetic factors. The high proportion of nodular subtype (60%) and predominance of tumors in head/neck regions (71%) are consistent with sun exposure and delayed diagnosis. The gender distribution (60% male) reflects occupational sun exposure patterns in Balochistan[14].

Our findings highlight the role of tumor size and histologic subtype in recurrence. Larger tumors and morpheaform variants require wider margins and possibly staged excisions. Despite single-stage procedures offering cosmetic advantages, careful preoperative planning and intraoperative assessment are essential to minimize residual disease[15]. The significant impact of positive margins on recurrence emphasizes the need for intraoperative frozen sections or Mohs micrographic surgery in select cases[16].

While our study adds valuable regional data, limitations include the cross-sectional design, , and a relatively short follow-up period. Prospective studies with longer follow-up and molecular profiling of BCC in this population are warranted. Public health initiatives focusing on early detection and patient education are crucial, particularly in high-risk occupational groups.

CONCLUSION

Our study highlights an 8.3% recurrence rate of BCC post single-stage excision in the Balochistani population, with higher recurrence linked to positive margins, morpheaform subtype, and larger tumor size. These findings emphasize the importance of achieving clear margins and suggest consideration of alternative surgical approaches in high-risk cases. Further longitudinal studies are needed to confirm these findings and inform management guidelines.

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