

## Frequency of incomplete excision of low risk facial basal cell carcinoma with a safety margin of three millimetre

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### Abstract

**Objective:** To determine the frequency of incomplete excision of low risk facial Basal cell carcinoma with a safety margin of 3 millimeters.

**Study design:** Descriptive Cross-sectional study.

**Settings:** Plastic and reconstructive unit, Hayatabad Medical Complex, Peshawar from 24th January 2015 to 23rd July 2016.

**Material and Methods:** Patients of any age and gender diagnosed with low risk facial BCC excluding those patients with the history of previous treatment or any concurrent skin neoplasia. After informed consent all the patients were subjected to surgical excision with a safety margin of 3mm under local anesthesia by plastic surgeons with a minimal 5 years post-fellowship experience. The histo-pathological examination of the excised specimens was performed by experienced histo-pathologists in the same laboratory for the margin clearance. All the data were collected in a specialized proforma and analyzed with SPSS version 17. The results were presented in the form of tables and graphs.

**Results:** A total of 88 cases of low risk facial BCC with age ranging from 31-90 years with mean age of 63.6+ 9.8 years including 56(63.6 %) male and 32(36.4%) female patients were included in the study. In 72(81.8 %) cases the low risk facial BCCs were completely excised. In 16(18.2%) cases the BCCs margins were reported to be incompletely excised. The frequency of in-complete excision was 14.3% and 25% in male and female patients respectively. The incomplete excision rate was found to be highest (42.86%) in the age group of 41-50 years.

**Conclusion:** The frequency of incomplete excision of low risk facial BCC with 3mm safety margin was higher than other studies with highest rates in the female group and comparatively younger age groups. Further multi-center, randomized control trails are suggested to support the results.

**Keywords:** Basal cell carcinoma, safety margin, histopathology, squamous cell carcinoma.

### Introduction:

Skin cancers are divided into melanomas and non-melanoma skin cancer (NMSC). Non-melanoma skin cancers mainly consist of Basal cell carcinoma and Squamous cell carcinoma.<sup>1</sup> Annually more than one million cases are diagnosed with non-melanoma skin cancer (NMSC).<sup>2</sup> Basal cell carcinoma accounts for 77% of all skin cancers<sup>3</sup> making it the most common human malignancy worldwide.<sup>4</sup> Basal Cell Carcinoma has been noticed on sun exposed areas such as head and neck in 88-90% cases.

BCC rarely metastasize but due to its significant local tissue destruction and disfigurement it is considered malignant tumour.<sup>5</sup> Ahmed A et al.<sup>1</sup> observed Basal cell carcinoma to be the second most common skin cancer in both males (51.1%) and females (48.9%).

The aim of the treatment is complete eradication of the tumour in the most cost effective way. The most effective treatment is surgical excision of the tumour along with macro-scopically normal surrounding tissue (margin of safety). Complete

### Received:

3rd September 2017

### Accepted:

26th December 2017

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excision of the basal cell carcinoma is the key to successful treatment. Incomplete excision is associated with higher rates of recurrence. At the same time it is also important to save the maximum normal tissue while achieving tumour free margins.<sup>6</sup> Some authors prefer a smaller safety margin of excision of 2-4 millimetre while others recommend 5-10 mm safety margin for high risk basal cell carcinoma (recurrent or morphea-like BCC) to reduce recurrence.<sup>7</sup> The reported rates of incomplete excisions vary from 5% to 25% in different parts of the world.<sup>8</sup> Babaye-Nazhad S et al.<sup>9</sup> reported 4% incomplete excision of basal cell carcinoma with excision margin of 4mm while Telfer NR et al.<sup>10</sup> reported 85% success rate (incomplete excision rate of 15%) with 3mm safety margin.

The aim of this study is to determine the frequency of in-complete excision of basal cell carcinoma with a safety margin of 3 millimetres from the most cosmetically important region of the body i.e. face. In the context that surgical treatment of BCC is a compromise between adequate excision and maximum healthy tissue preservation the rationale of this study is that eradicating the tumour with minimal safety margin (3mm) will achieve better cosmesis, easy and cost-effective reconstruction of the resultant wound.

#### **Material and Methods:**

This descriptive cross-sectional study was performed in the department of Plastic and Reconstructive unit, Hayatabad Medical Complex, Peshawar from 24th January 2015 to 23rd July 2016. A total of 88 patients presented with low risk facial BCC were included in the study with non-probability consecutive sampling form out-door department. Patients of any age group and gender diagnosed with low risk facial Basal Cell carcinoma (A non-recurrent basal cell carcinoma of less than 2 cm and not involving the nose, ear and peri-orbital area) were included in the study. Patients with history of previous radiotherapy, chemotherapy or having any other concurrent (co-existing) skin neoplasias were excluded as they might have acted as confounders and introduce bias to the study results.

All the patients with low risk facial Basal cell carcinoma fulfilling the inclusion criteria were enrolled from out-patients' department and referral from other departments. An informed consent was taken from all the patients after explaining the study protocol. The diagnosis was made on the basis of detailed history of the lesion, any previous treatment and examination. All the patients were subjected to surgical excision under local anaesthesia after pre-operative baseline investigations.

All the tumours were excised by experienced plastic surgeons (with at least 5 year surgical experience). The excised tumour specimens were marked along its visible borders. Then a further 3mm clinically tumour free margin was also marked. All the tumours were excised along the marked 3mm safety margin with the deep dissection limited to the subcutaneous tissue. The surgical wounds were closed by primary closure, local flaps, regional flaps, full thickness skin graft or partial thickness skin graft as appropriate. The excised specimens were marked at two positions (12 and 3 o'clock) with polypropylene suture. All the specimens were sent to the same laboratory and were examined by experienced histo-pathologist (with a minimum 5 year experience). After histo-pathological analysis, tumor specimens with excised margins containing the tumour cells were labeled as in-completely excised Basal cell carcinoma. On the other hand, tumor specimens free of tumour cells they were considered as completely excised Basal cell carcinoma. The details were recorded in a specialized proforma structured with the help of a statistician. The exclusion criteria were strictly followed to exclude confounders and bias in the results. The collected data of the study were organized and analyzed with the help of statistical package for social sciences (SPSS version 17). Frequencies and percentages were computed to present all categorical data including gender, completely excised tumour, in-completely excised tumour and numerical data i.e. age were presented by Mean+S.D. In-complete excision frequencies were stratified among the age and gender to see the effect modifiers. All the results were presented in the form of tables and graphs.

Table-1: Age distribution of the low risk facial BCC

S/No	Age Group (years)	Male Patients	Female Patients	Total
1	31-40	0	1 (3.12%)	1 (1.14%)
2	41-50	4 (7.14%)	3 (9.37%)	7 (7.95%)
3	51-60	15 (26.78%)	14 (43.75%)	29 (32.95%)
4	61-70	26 (46.49%)	11 (34.37%)	37 (42.05%)
5	71-80	8 (14.28%)	1 (3.12%)	9 (10.23%)
6	81-90	3 (5.35%)	2 (6.25%)	5 (5.68%)
	Total	56 (100%)	32 (100%)	88 (100%)

Table-2: Histopathological margin status of the excised low risk facial BCC

S/No.	Margin status of the Excised BCC	Frequency (n)	Percent (%)
1	Completely excised	72	81.8
2	Incompletely excised	16	18.2
	Total	88	100.0

Table-3: The age distribution of the margin status of the low risk facial BCC excision

S/No.	Age Group	Completely Ex-cised BCC	Incompletely Ex-cised BCC	Total
1	31-40	1 (100%)	0	1
2	41-50	4 (57.14%)	3 (42.86%)	7
3	51-60	21 (72.41%)	8 (27.6%)	29
4	61-70	33 (89.19%)	4 (10.81%)	37
5	71-80	8 (88.9%)	1 (11.11%)	9
6	81-90	5 (100%)	0	5
	Total	72 (81.8%)	16 (18.2%)	88

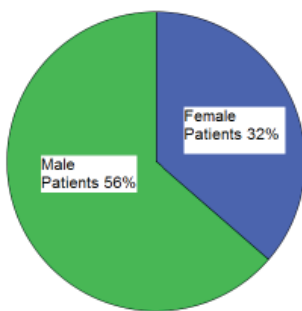


Figure 1: Pie chart of the gender distribution of the low risk facial BCC

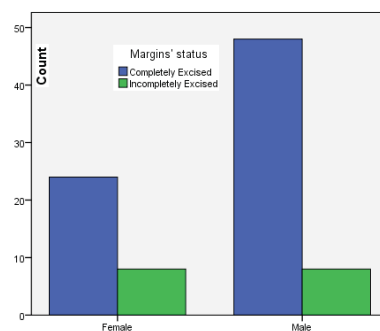


Figure 2: Gender distribution of the margin status of the low risk facial BCC

### Results:

In the current study a total of 88 cases of low risk facial BCC were included. The age of the studied patients ranged from 31 years to 90 years. The mean age of the studied cases was 63.6 years with SD+of 9.8 (table-1).

Out of the total 88 cases 56(63.6 %) were males and 32(36.4%) were females (figure-1, 2). The male to female ratio was 1.75:1 or 3.5:2.

Out of the total 88 patients, 37(42.05%) presented in the age of 61-70 years thus making it the most common age of presentation for the low risk facial BCC in the current study. 29(32.95%) patients presented with low risk facial BCC at the age of 51-60 years (2nd most common decade for presentation of low risk facial BCC).

In the gender point of view, the most common decade for presentation of low risk facial BCC in the male group was 61-70 years with a total of 26(46.49%) male patients. For the females the most common age for the presentation of low risk facial BCC was 51-60 years with a total of 14(43.75%) female patients presenting in this age group in this study (table-1).

In the present study a total of 88 patients were operated for the excision of low risk facial BCC under local anaesthesia with a safety margin of three millimetres. The histo-pathological examination of the excised specimen revealed that out of the total 88 cases, 72(81.8 %) low risk facial BCCs were completely excised. In 16 cases (18.2%) the low risk facial BCCs margins were reported to be incompletely excised (table-2).

In the gender point of view, out of the total 56 male patients the frequency of incomplete excision was 14.3%(8) with a success rate of 85.7% (48). The incomplete excision rate for the 32 female patients was 25%(8) with a success rate of 75%(24).

The incomplete excision rate for the low risk facial BCC was highest in the comparatively younger age group of 41-50 years which was 42.86%. In the current study the success rate of the surgical excision increases with the decreasing frequency of the incomplete excision rate with the advancing age (table-3).

### Discussion:

Basal cell carcinoma is the most common human malignancy with the characteristic behavior of local invasiveness and low rates of metastasis. In comparison to other skin malignancies its occurrence proportion is 4-5 Basal cell carcinoma

for every one Squamous Cell Carcinoma and 8-10 basal cell carcinoma for every one melanoma. In 70-80% cases it occurs on the face. The UV rays being the most widely accepted etiological factor generates mutagenic photo-products in the DNA leading to mutations in the important regulator genes. Due to the typical slow growing behavior and low rates of distant metastasis of the BCC, surgical excision with a reasonable safety margin is the major and highly effective therapeutic option.<sup>11</sup> The margin of safety is a compromise between the adequacy of the basal cell carcinoma excision and aesthetic results of the reconstructed wound. Which mean we as plastic surgeons should find a safety margin which can completely eradicate the basal cell carcinoma and easy to reconstruct with aesthetic results acceptable to the patients. The existing guidelines for the basal cell carcinoma less than 2cm in greatest dimension suggest the tumor clearance in 85% cases with a safety margin of 3mm. The tumor clearance increases to 95% with safety margin of 4-5mm for basal cell carcinoma less than 2cm in greatest dimension.<sup>10</sup> In the current study we have subjected all the 88 cases of low risk facial basal cell carcinoma to surgical excision with a safety margin of 3millimeters. Those basal cell carcinoma which are located in the regions of embryonic fissures i.e. retro-auricular peri-nasal, peri-orbital, peripalpebral and scalp is considered at higher risk for recurrence.<sup>11</sup> As we excised all the basal cell carcinoma with a limited recommended safety margins i.e. 3millimeters, so only low risk facial basal cell carcinoma were included in the study.

The 61-70 years was the most common age group of presentation for the basal cell carcinoma in our population. The age of presentation for basal cell carcinoma is consistent with other studies by Shah SA et al.<sup>12</sup> and Asif M et al.<sup>13</sup> In contrary to our results Memon GA et al.<sup>14</sup> observed the age group for basal cell carcinoma as 50 years to 70 years. Maghsodnia G et al.<sup>15</sup> reported the age range for the presentation of basal cell carcinoma as 35 years to 72 years with mean age of 51 years. The BCC development requires approximately 10-50 years therefore more than half of the patients present at the age between

50-80 years but the incidence of BCC is on the rise below the age of 40 years (>5% of the total cases) due to the prolonged, unprotected sun exposure during tanning especially in the young female population.<sup>11</sup>

Most of the literature suggests that BCC predominantly affect the male population with male to female ratio of 3:2.4. The results of the current study are consistent with the literature. The male to female ratio was 3.5:2. This is because in most parts of our province the females are house wives and cover their body in veil while males wear comparatively brief garments and work for the living in the fields. It is in contrary to another local study by Shah SA et al.<sup>12</sup> who reported 60.7% as females.

The literature is very diverse about the frequency of incomplete excision of basal cell carcinoma. According to different series the frequency of incomplete excision varies from 0.7% to 50%.<sup>16</sup> According to the international guidelines for low risk BCC excision, the completeness of excision is achieved in 85% cases when it is excised with a safety margin of 3 millimeters with an incomplete excision rate of 15%.<sup>10</sup>

In the present study all of patient with low risk facial BCCs were treated by surgical excision with a safety margin of 3 millimeters with an incomplete excision rate of 18.2%. While in 81.8% of the patients the excision was successful by completely excising the tumor.

Asif M et al.<sup>13</sup> in their study from Rawalpindi reported the frequency of incomplete excision as 23.4% which is higher than the results observed in our study population. Khan FT et al.<sup>17</sup> from Nuneaton UK reported the rate of incomplete excision as 16% which lower than our results but is comparable. In contrast to our results, in another series by Kimyai-Asadi A et al.<sup>18</sup> from Houston, Texas, USA observed the incomplete excision rate as 13% in surgical excision with a 3 millimeter safety margin. In another study from Germany, Breuninger H et al.<sup>19</sup> reported the incomplete excision rate of 16% with 3 millimeters safety margins. Jankovic I et al.<sup>20</sup> showed

the frequency of incomplete excision as 18.92% when excised with 3-4 millimeter safety margins which is slightly higher than our results. In contrary to our study Kumar P et al.<sup>16</sup> showed very low frequency of incomplete excision (4.1%) when excised with 3-4 millimeters safety margins.

In the current study the frequency of incomplete excision in low risk facial BCC with 3 millimeters safety margin of excision was found higher in females (25%) as compared to male group (14.3%). The data in the literature is sparse to compare this aspect of our study result. This may be due to the higher cosmetic concern in female population on both patients' and plastic surgeons' behalf leading to tentative excision and higher rate of incomplete excision. The frequency of incomplete excision of low risk facial BCC was higher in the younger age group (41-50 years) and declined in the elderly population which is due to the increase in the laxity and redundancy of skin with the advancing age.

In the present study the frequency of incomplete excision with 3 millimeter safety margin for low risk facial BCC is slightly higher than other international studies and the frequency suggested by the already existed guidelines. This increase may be due to different reasons found in our set up. Firstly, the lack of use of magnification devices i.e. loupes while marking the BCC and the safety margins before excision can lead to improper identification of the tumor margins and increased frequency of incomplete excision. Secondly, the increased patients' burden and long patients list for the operation theater can also be a contributing factor. Another reason can be the tendency in the young Plastic surgeons to concentrate on the cosmetic results rather than the tumor eradication.

The limitation of our study is that it is descriptive study with lack of comparison group. Secondly the small number of the study sample is another limitation of the current study. It is a single center study which is another weakness of this study. Multicenter, randomized controlled trials are suggested to confirm the results of this

study. Proper lighting and magnification surgical devices use is advised to ensure the adequacy of BCC excision.

#### **Conclusion:**

Despite the good results in the existing guidelines of excision of low risk facial BCC with 3 millimeter safety margin, the frequency of incomplete excision was higher than the international data. Furthermore the frequency of incomplete excision was found higher in younger age groups and female population. So re-consideration of the safety margin of excision is advised to ensure the adequate surgical eradication of low risk facial BCC and thus help reduce the morbidity of the patients' as well as the economic burden on the healthcare facilities. Further multicenter, randomized control trials are suggested to get better view of the frequency of incomplete excision with limited safety margin of excision.

**Conflict of interest:** None

**Funding source:** None

#### **Role and contribution of authors:**

Dr Hidayat Ullah, idea conception, data collection, data analysis and references and wrote the initial write-up.

Dr Mansoor Khan, idea conception, data collection, data analysis, references

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