

# Incidence of incomplete excision in surgically treated basal cell carcinomas and identification of the related risk factors

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**Background:** Surgery is the most frequent treatment modality for basal cell carcinoma but in spite of its high cure rate, the frequency of incomplete excision varies widely (0.7-50%) among dermatologic centers. Our case series was designed to determine the frequency of incompletely excised basal cell carcinoma and the related risk factors.

**Methods:** A total of 1424 basal cell carcinoma (1040 patients) lesions which were excised in Razi Dermatology Hospital of Tehran from 2006 to 2008 were evaluated in this case series and their findings were analyzed with SPSS software.

**Results:** Incidence of incomplete excision was 12% and involvement of the deep margin was observed in 54% of these lesions. Factors related to incomplete excision were infiltrative, morpheic and micronodular subtypes, lesions larger than 20 mm, those repaired by skin grafts and those that received local anesthesia. There was no statistically significant difference in age, sex, site of lesions and childhood history of radiotherapy for tinea capitis.

**Conclusion:** Recognizing the risk factors related to incomplete excision of BCCs would help us consider a wider excision margin for high risk tumors.

**Keywords:** Basal cell carcinoma, incomplete excision, surgery, tumor margin

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## INTRODUCTION

Basal cell carcinoma is the most common skin tumor in Caucasian individuals<sup>1</sup>. Surgical resection is the main treatment modality due to its effectiveness and histology control. The incidence of incomplete excision varies widely (0.7- 50%) in the world<sup>2-9</sup>. This study was designed to identify the frequency of this problem and related risk factors in Razi Hospital, Tehran (Iran). Recognizing these factors helps the surgeons consider a wider excision margin for high risk tumors. Decreasing the need for further treatment and lowering the morbidity rate of the patients are other advantages of knowing the related risk factors.

## PATIENTS AND MATERIALS

In this case series, all patients with surgical excision of basal cell carcinoma in Razi Hospital, Tehran (Iran), between 2006 and 2008 were included. Punch, shave and incisional biopsies and incomplete data were excluded. All patients were visited by a dermatologist and a plastic surgeon and variables were age, sex, tumor site and size, history of childhood radiotherapy for tinea capitis, method of repair and type of anesthesia. The results were analyzed with SPSS and using chi-square test. Mean age was compared with T-test. P value<0.05 was considered significant. Before the operation, the excision margins were defined

through clinical judgment; after considering the size, site and type of tumor, most tumors were excised with a margin of 4 mm and sent to the department of pathology at the same center. The samples were studied and the histological subtype and details of the completeness of excision were reported.

## RESULTS

During the three-year period, 1424 basal cell carcinoma (1040 patients) lesions were excised with the rate of incomplete excision being 12.07% (172 lesions). In 54% of the tumors, deep margin and in 31.4% of them, lateral margin was involved. Both margins were involved in the rest.

### Age and Sex

In the incomplete excision group, mean age was 63.6 years with a range of 16 to 87 years. The mean age of patients in the complete excision group was 62.2 years with a range of 11 to 94 years. This difference was not statistically significant. The rate of incomplete excision was 14.1% for men and 11.3% for women but their difference not significant.

### Site of lesions

All the incompletely excised basal cell carcinomas were located in the head and neck region (12.3%). The most common sites for incomplete excision were medial canthus, lower eyelid and nose although the difference was not statistically significant (Figure 1).

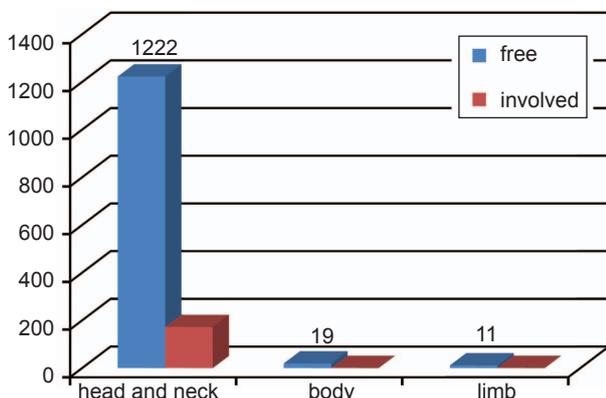


Figure 1. Frequency of incomplete excision by site

### Histologic Subtype

Nodular type was the most common type in general. Significant differences ( $P=0.0001$ ) in the percentage of incomplete excision for infiltrative (29%), morpheic (14.3%), micronodular (13.8%), nodular (11.1%) and superficial basal cell carcinoma (7.7%) were observed (Table 1).

### Size of lesions

Lesions were divided into three groups according to the parameter of size. There were statistically significant differences in the frequency of incomplete excision according to the size of the lesions: greater than 20 mm (17.7%), lesions between 10 to 20 mm (11.2%), and lesions smaller than 10 mm (7.7%).

### History of childhood radiotherapy for tinea capitis

Incomplete excision was detected in 13.1% and 12.6% of the individuals with a positive and negative personal history of childhood radiotherapy for tinea capitis. The difference, however, was not statistically significant.

### Type of closure

The percentage of incomplete excision in graft, flap and direct closure was 19.6%, 10.4% and 12% respectively with a significant difference ( $P<0.003$ ) (Figure 2).

### Type of anesthesia

There was a significant difference ( $P<0.012$ ) in the

Table 1. Percentage of incomplete excision by histologic subtype

BCC type	Free	Involved	Total
Micronodular	106 (86.2%)	17 (13.8%)	123 (100%)
Infiltrative	54 (71%)	22 (29%)	76 (100%)
Morpheic	54 (85.7%)	9 (14.3%)	63 (100%)
Nodular	744 (88.9%)	93 (11.1%)	837 (100%)
Superficial	287 (92.3%)	24 (7.7%)	311 (100%)
Adamantirous	0 (0%)	1 (100%)	1 (100%)
Adenooid	7 (70%)	3 (30%)	10 (100%)
Unknown	0 (0%)	3 (100%)	3 (100%)
Total	1252 (87.9%)	172 (12.1%)	1424 (100%)

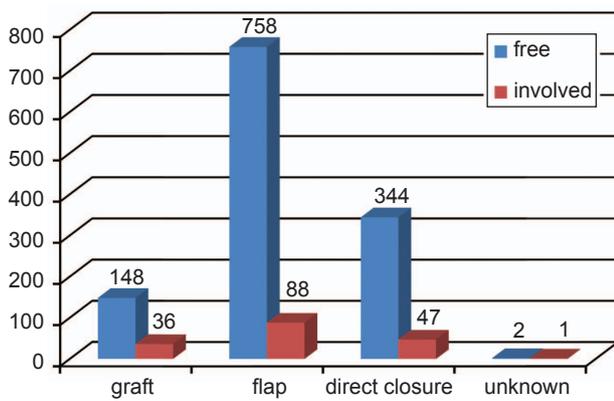


Figure 2. Frequency of incomplete excision by type of closure

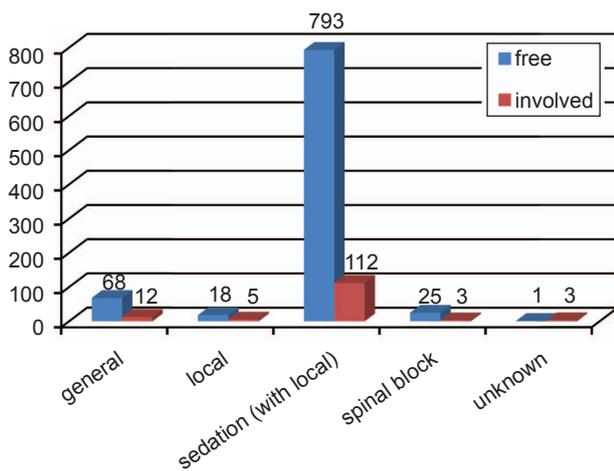


Figure 3. Frequency of incomplete excision by type of anesthesia

rate of incomplete excision among local anesthesia (21.7%), general anesthesia (15%), sedation (with local anesthesia) (12.3%) and spinal block (10.7%) (Figure 3).

## DISCUSSION

Although conventional surgical excision of basal cell carcinoma has a high cure rate of 95-99%<sup>11</sup>, achieving this aim is possible when the excision is complete. The recorded rate of incomplete excision in most studies ranges from 0.7-25%<sup>11-15</sup>. In our study, the incidence of incomplete excision was 12%. In contrast to studies with high rates of incomplete excision at the lateral margin<sup>3,9,14,16</sup>, we found that excision was incomplete at the deep margin in the majority of the evaluated resections. The mean age of the patients in the incompletely excised group was 63.6, rather similar to Boon study

data in Singapore<sup>17</sup>. Consistent with most other series, we did not find age and sex as significant variables<sup>17-20</sup> although they were significant in Kumar's study<sup>14</sup>. We noted that 97.8% of all lesions were located in the head and neck region that is slightly more than series with reported incidence rates of 80-90%<sup>6,16,19</sup>.

The rate of incomplete excision was 12.3% for the head and neck region, and there were no incompletely excised lesions on the body and limbs, maybe due to the ability of the surgeons to perform a wider excision. This finding was similar to Kumar's audit<sup>14</sup>. The rate of incomplete excision for medial canthus, lower eyelid, nose and forehead was 18.9%, 16.9%, 15.2% and 12.9%, respectively; however, these differences were not statistically significant in contrast to other reports which have identified location as the main factor of incomplete excision. Head and neck region, especially midface, is the site of highest incidence<sup>3,5,14,16</sup>. This is the reflection of the lack of enough skin and also cosmetic problems of resections. Midface is on embryogenic fusion planes where the tumor can spread aggressively<sup>21</sup>. Site was not statistically significant in Kumar and Watson's study<sup>19</sup>. The rate of incomplete excision for infiltrative and morpheic basal cell carcinoma was the highest. Superficial subtype had the lowest rate of 7.7%. Su found a high rate for morpheic and superficial BCCs<sup>20</sup> but the latter is in contrast to our findings. Infiltrative and morpheic subtypes have a high percentage of incomplete excision in many reports<sup>16,19-20</sup>. This finding is associated with difficulty in detecting the clinical margin; therefore, biopsy of these subtypes should be taken as an indicator for a wider margin excision. The percentage of incomplete excision was 11.1% in nodular lesions that was the most frequent subtype (58.8%) in our study. Thirty two percent of the lesions were greater than 20mm and incomplete excision rate was 17.7% in this group which is consistent with Su's study<sup>20</sup>. This might be due to the greater subclinical extension in larger lesions<sup>22,23</sup>. There are reports indicating that tumor size is not statistically significant<sup>17-19</sup>. Radiotherapy used to be a treatment modality for tinea capitis and is one of the most important risk factors of basal cell carcinoma<sup>24</sup>. In our study, 34.5% of the patients had a positive history and the rate of incomplete excision was 13.1% in this group, but the difference was not statistically

significant. Incomplete excision rate was higher in lesions repaired by grafting (19.6%). This might be attributed to the fact that larger, deeper and more complex lesions are repaired by grafting. Flapping was the most frequent method of repair (59.4%) and had a 10.4% rate of incomplete excision. Like us, Kumar and Su found the highest rate of incomplete excision for grafting<sup>14,20</sup>. In this study, the rate of incomplete excision was high for direct closure repaired lesions which might show an inappropriate excision margin. Local anesthesia with sedation was the commonest method (87%) and had an incomplete excision rate of 12.3%. Incomplete excision rate was the highest for local anesthesia (21.7%) but a small number were treated (2.2%). The incomplete excision rate of 15% in the generally anesthetized group might be associated with the complexity of the tumor.

In this study, we tried to demonstrate the incidence of the incompletely excised BCC lesions and to recognize the related variables to consider a wider excision margin for high risk tumors because the recurrence rate is 1% in completely excised lesions in contrast to 30% incomplete excisions<sup>25</sup>.

As the control of recurrent BCCs is more difficult and the fact that tumor cells may be found in up to 54% of the re-excisions, some authors suggest treating incompletely excised lesions in the immediate post operative period to prevent extensive surgery<sup>4,8,9,21,25</sup>. Nevertheless, controversy remains with regard to the management of incompletely excised BCCs. Some other factors related to incomplete excision such as the level of the expertise of the surgeons could not be assessed in this study and need to be addressed in larger series.

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