

## **Research Article**

# **Hospital volume is associated with positive margins after Basal Cell Carcinoma excision**

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**Abstract:** Basal Cell Carcinoma typically occurs on the head and neck. Excision with clear margins is the primary goal of treatment. Involved surgical margins occur more frequently on the head and neck and may be related to surgical volume. All histology reports generated by the Toowoomba Base Hospital Department of Pathology in Queensland, Australia over an 18 month period confirming the diagnosis of BCC were reviewed. In results 483 histology reports from 22 hospitals were analysed. 75% of BCC were completely excised. Incomplete excision was related to volume (< 100 specimens), location on the head but not preoperative diagnosis. In conclusion Patients living in outlying areas with a Basal Cell Carcinoma located on the head should be referred to the nearest major hospital for surgical treatment.

**Keywords:** Basal Cell Carcinoma, workload, margin, surgery

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## **INTRODUCTION**

Basal Cell Carcinoma (BCC) is the most common cutaneous malignancy [1]. It is directly related to Ultra Violet light exposure especially during childhood and adolescence [1, 2]. It has been recently recognised that almost all spontaneous BCCs have mutations in the hedgehog signalling pathway [1]. There are four clinical subtypes: superficial, nodular, pigmented and morpheaform [1]. More than three quarters occur on the head and neck [2]. Treatment options include Mohs micrographic surgery, standard wide local excision with 4 mm margins, curettage as well as nonsurgical (radiation, imiquimod, photodynamic therapy, ingenolmebutate and vismodegib [1].

Typically, basal cell carcinoma is treated by excision. The overall rate of BCC recurrence after complete excision is < 5% [2]. Mohs micrographic surgery has the lowest recurrence rate (especially lesions larger than 2 cm, morpheaform or high risk sites) [2]. There is Level C evidence supporting re-excision if the margins are involved as recurrences are more difficult to control [2]. Areas with high risk for recurrence include central face, eyelids, eyebrows, periorbital, nose, lips, chin, mandible, temple and ear and surrounding skin [2].

The primary objective of this study is to determine the relationship between a Hospital's workload and rate of inadequate margins after BCC excision (i.e. < 100 or ≥ 100 cases). The secondary objective was to determine if the site of the lesion or its

pre-operative diagnosis are related to the rate of complete excision.

## **METHODS**

This is a retrospective descriptive study conducted in a major provincial hospital in Queensland, Australia with a large referral basin of peripheral hospitals. This study was approved by Toowoomba Base Hospital Ethics Committee. All histology reports generated by the Toowoomba Base Hospital Department of Pathology between February 1999 and June 2000 confirming the diagnosis of BCC were identified from a pathology register. Only pathology reports could be accessed. A positive margin was defined as tumour within 1 High Power Field (Close) or at (Involved) excision margin. Categorical variables are presented as frequency (percentage) and significance was determined using Fisher Exact Test. The only inclusion criterion was a histological diagnosis of "basal cell carcinoma". All other cutaneous malignancies were excluded. Specimens sent for frozen section only were excluded. Specimens were also excluded where a clinician suspected BCC but the final histology report did not confirm BCC. Samples were not re-evaluated for the purposes of this study.

## **RESULTS**

22 hospitals submitted Basal cell Carcinomas to Toowoomba Base Hospital for histological assessment over a period of almost 18 months. 483 specimens form the basis of this report. All were standard excisions. Another 32 lesions were excluded (30 biopsies and 2 frozen section). The deep margin

was involved in 3%, close in another 3% and clear in 94%. The lateral margin was involved in 16%, close in 7% and clear in 77%. Overall, 75% of BCC were completely excised and 25% had a positive margin. As all specimens were identified from a pathology register, patient demographics were not available.

56% of lesions were from the head. Excision was 100% complete at peripheral sites (lower limb, abdomen and chest) but not at upper limb, head and neck as demonstrated in Chart 1. Overall, 68% of lesions on head were excised completely vs. 83% of BCCs at all other sites ( $p = 0.0002$ ). The surgeon's preoperative diagnosis of BCC as recorded on the pathology request form vs. squamous cell carcinoma, other or none did not improve the rate of clear margins ( $p = 0.55$ ). Sites which submitted  $\geq 100$  cases had a significantly higher rate of clear margins when compared to smaller volume hospitals (78% vs. 69%;  $p = 0.04$ ). Of the 38 re-excision specimens, 95% revealed residual BCC. The rate of complete re-excision was no better than for primary excision (79% vs. 75% respectively). BCC's with multifocal histology accounted for only 16% of specimens. These were inadequately excised in just under 40% of cases, being significantly higher than for non-multifocal lesions (23%;  $p < 0.01$ ).

## DISCUSSION

Skin cancer is the most common malignancy in humans. Basal Cell Carcinoma is the most common cutaneous malignancy – it is slow growing, infiltrating and very rarely metastasizes. The main risk factor is UVB radiation from sun exposure. Excision continues to be the most frequent treatment modality but clinicians may be unaware of some pitfalls. In this study, low volume hospitals had a significantly higher rate of involved margins following Basal Cell Carcinoma excision than higher volume centres. The overall rate of complete BCC excision was 75% but the rate of inadequate excision of lesions on the head was almost double of that from other sites (32% vs. 17%). The correct preoperative diagnosis failed to improve the rate of complete excision ( $p = 0.55$ ). A high rate of involved margins on the head is well recognised in the literature [3, 4].

The pathology database did not contain patient demographics to confirm prior observations that Basal Cell Carcinoma is more frequent in men compared to women and that men have a younger age at diagnosis [3]. The following are typically associated with poor prognosis: size  $> 5$  cm (giant), morphoeic subtype, infiltrative and micro nodular histological subtype,

immunosuppression, recurrent or incompletely excised lesions [5].

Patients and clinicians may be concerned that a preoperative incisional biopsy of a cutaneous malignancy may result in an increased rate of local recurrence and this remains controversial for malignant melanoma [6]. A preoperative biopsy may be performed if the lesion is large (aesthetic concerns) or the lesion is not thought to be malignant. However, a recent Korean study found an incisional biopsy was not associated with BCC recurrence. The authors observed a tendency towards a higher recurrence rate in patients with a long interval between biopsy and excision [6].

In a large study, local recurrence for completely excised BCCs was 6% and for incompletely excised BCCs 27% [4]. Wolf's review demonstrates that excision margins of 2 mm, 3 mm and 4 mm will eliminate all tumour in some 75%, 85% and 98% of BCCs respectively [5]. Some propose 4mm margins on the face and 6mm margins elsewhere [5]. The excision margin can be further individualised, nodular BCCs excised with a margin of 28% of the radius and diffuse lesions excised with a margin of 160% of radius will ensure 99% certainty of excision of all tumours [6].

Imiquimod cream may be used for low risk or superficial BCCs as an alternative to surgery. A 2012 British study found patients place significantly more emphasis on the cosmetic outcomes and side effects as opposed to their chance of complete clearance and direct cost [7]. As such, patients with a previous experience of BCC treatment were more likely to value a treatment with the best cosmetic outcome as opposed to patients with no past BCC treatment experience [7].

This study includes the analysis of lesions with involved and close margins. The later are significant in that Pascallat al have demonstrated a recurrence rate of 33%, 12% and 1.2% with incomplete, close and complete excisions respectively [8]. Others have illustrated that each time a BCC recurs the larger is its subclinical extension [9]. Incompletely excised BCCs tended to be flat, predominantly on head and neck and exhibit an infiltrative growth pattern [10].

Hospitals that submitted less than 100 specimens during the study period had significantly higher rates of incomplete excisions than those with a higher workload. For patients living in outlying areas, the author recommends that where possible, those with a BCC located on the head be referred to the nearest major hospital for surgical treatment.

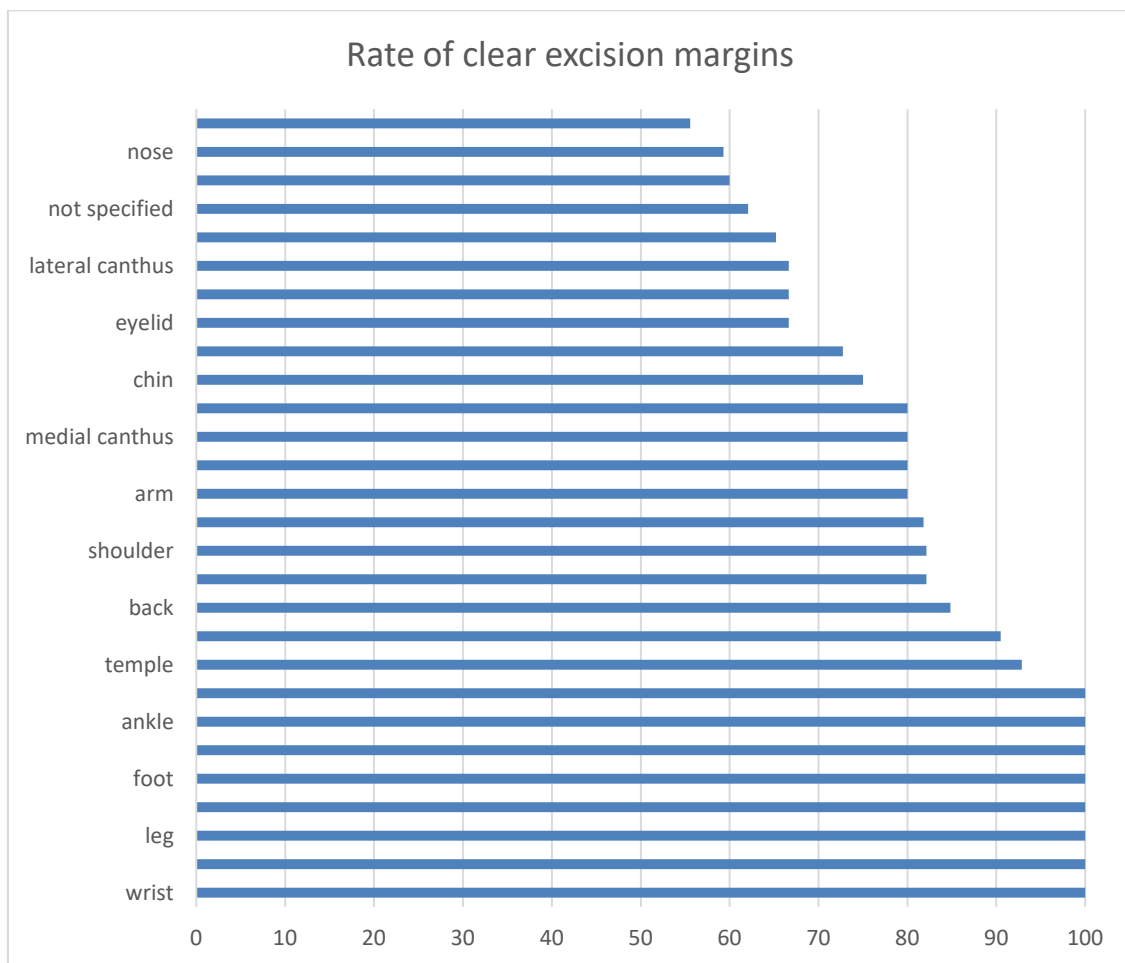


Chart 1: Basal Cell Carcinoma location and rate of clear margins

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