

Utility of Intraoperative Frozen Section for Basal Cell Carcinoma of the Head and Neck for Margin Clearance

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Abstract

Background: Surgical excision is the treatment of choice for basal cell carcinoma. Complete removal is the key to cure.

Objective: To determine the utility of intraoperative frozen section in basal cell carcinoma surgery of high risk cases on the head and neck to achieve margin clearance.

Study Design: Prospective descriptive study

Place and duration of study: MH Rawalpindi, Army Medical College – February 2015 – May 2018.

Methodology: All patients of high risk basal cell carcinoma, on the head and neck, undergoing excision and repair after intraoperative frozen section were included in the study. In addition to demographic profile of the patient, site and clinical type of the lesions were recorded. Histopathology report indicating margin clearance was noted.

Results: A total of 96 patients with basal cell carcinoma were operated upon with intraoperative frozen section. Five patients had recurrent basal cell carcinoma whereas 91 had primary lesions. Fifty four (56.3%) patients showed all margins clear of tumor on frozen section whereas 42 (43.8%) patients required further excision of one or more margins based on the result of frozen section.

Conclusion: Intra operative frozen section helped conserve skin in addition to saving 42 (43.8%) patients from a second surgical procedure.

Keywords: Frozen section; Basal cell carcinoma (Bcc); Mohs micrographic surgery

Introduction

Basal cell carcinoma (bcc) is the most common human cancer being almost as common as all other human cancers combined [1-4]. It accounts for upto 75% of all cutaneous malignancies [5]. Ultra violet radiation is the most important risk factor, intermittent sun exposure and child hood sun exposure being the most common etiological factors [1-3,6]. Mortality from Bcc is less than 1% and metastases occur even more rarely; however the tumor is locally invasive with a significant morbidity [2,5,7]. It is often not easy to identify the clinical margins and it is possible to underestimate the size of the actual tumor, particularly in the danger zone (H zone) of the face, where bccs occur more frequently and are likely to recur.

Surgical excision is the gold standard for treatment of bcc. A recent meta-analysis, when comparing treatment modalities, confirmed that surgery is superior to cryotherapy, radiotherapy, photodynamic therapy, topical 5 fluorouracil and imiquimod in terms of complete lesion clearance and least recurrence rate [8]. Surgical techniques such

as Mohs Micrographic Surgery (mms) and frozen section may be used to reduce the risk of recurrence. Mms conserves tissue and ensures margin clearance but it is more expensive, its availability is limited and there are long waiting times. Mms is recommended for high risk tumors. High risk bccs include those with histologically aggressive subtypes, tumors with perineural invasion, tumors located in anatomically sensitive sites, recurrent tumor, tumors larger than 2 cm in size, tumors with lymph node involvement and metastasis, and those associated with immunosuppression [1,5].

Frozen section is a reliable and efficient tool at places where resection aims to conserve skin but it is not recommended for small tumors where there is excess skin [9]. Frozen section is a useful, affordable and efficient method in the presence of trained staff. Recurrence rate compares favourably with mms [10], at the same time being more cost effective. En face frozen section technique is better than standard frozen section technique as it enables us to examine the entire peripheral and deep margins rather than just part of the margin so that chances of recurrence are reduced [5]. Standard frozen section assumes that the tumor is growing symmetrically equally in all directions and examines two cross sectional strips at right angles to each other.

Conventionally, bccs are treated by surgical excision at our department. However, in the absence of mms at our institute we use en face frozen section to evaluate the entire peripheral and deep margins of high risk bccs. Bccs are usually asymptomatic tumors and present late in our country because of lack of free and easy access to doctors, lack of education and lack of public awareness of skin cancers.

Materials and Methods

This is a prospective descriptive study carried out at Dermatology Department, Military Hospital, Rawalpindi and Histopathology Department, Army Medical College. All patients who had a basal cell carcinoma excised with intra operative frozen section, for margin clearance, between February 2015 and May 2018, were included in the study. Patients whose Bcc involved the lid margin were referred to ocular plastic surgeons and thus had to be excluded. The demographic details of the patients, whether the tumor is primary or recurrent, the clinical type and site of tumor, and method of repair was recorded. Also the result of frozen section, whether the margins were clear after frozen section were recorded. Ninety six patients fulfilled the inclusion criteria and were included in the study. Bccs were excised with a 2-3 mm margin and frozen section was done in vitro to confirm margin clearance.

Frozen section technique involved marking the tumor margins, mapping the tumor on paper immediately after removal and then the specimen was sent to the histopathology department in a clean container in normal saline. Using the en face [5] frozen section technique the entire peripheral margin and the deep margin was analyzed for clearance. If tumor was found to involve any of the peripheral margins or deep margin that particular margin was re-excised and that too sent for repeat frozen section examination. The histopathology result was conveyed over the phone and once margins were clear, reconstruction was started. Rapid frozen section is less accurate than paraffin sections thus all sections were submitted for paraffin sections later to reconfirm the original pathology and margins [3].

No complications occurred in any of the patients postoperatively. All the patients were given amoxicillin plus clauvulanic acid post operatively for 5-7 days.

Results

Ninety-six bccs from 96 patients were included in the study. Sixty-three (65.6%) patients were male while 33 (34.4%) were females (Table 1). Male to female ratio was 1.9:1. Their ages ranged from 28 years to 85 years, with a mean age of 63.25±12.79 years. Ninety one (94.79%) were primary tumors while 5 (5.2%) were recurrent tumors.

The tumors were located on the cheek in 33 patients (34.4%), on the nose in 29 (30.2%) patients, on the eyelid (lower) in 7 (7.3%), on the forehead and temple in 5 (5.2%) patients each, on the nasolabial crease in 4 (4.2%) patients, on the lip and ear in 3 (3.1%) patients each, on the preauricular area and neck in 2 (2.2%) patients each and on the retroauricular area, angle of jaw and chin in 1 (1%) patient each.

Forty two Bccs were nodular (17 of these were pigmented). Twenty two were ulcerated (out of which 5 were in addition pigmented), 15 were nodular with surface ulceration (7 of these were pigmented), 15 were morpheic (1 of these ulcerated and 1 was pigmented). There were 2 superficial spreading bccs (Table 1). In total 30 (31.2%) of all the clinical types of bccs were pigmented.

S No.	Clinical Types	Total (%)
1	Nodular	42 (43.7)
2	Ulcerated	22 (22.9)
3	Nodular Ulcerated	15 (15.6)
4	Morpheic	15 (15.6)
5	Superficial Spreading	2 (2)

Table 1: Clinical types of Bcc.

All margins were found to be clear in 54 (56.3%) cases on primary excision. Forty two (43.8%) cases had one or more margins involved after the first excision and required a further excision of one or more margins before closure. Frequency of margins involved after first excision is given in Table 2 and the site of involved margins in Table 3. All margins were found to be clear after a second excision.

Margins Involved	Frequency	Percent
lateral margin	27	28.1
deep margin	10	10.4
deep and lateral	5	5.2
Total	42	43.8
Clear	54	56.3
Total	96	100

Table 2: Margins after first excision on frozen section.

Site of tumor	Margins involved			Total
	lateral margin	deep margin	deep and lateral	
Cheek	12	1	1	14
Retroauricular	0	0	1	1
Angle of Jaw	1	0	0	1
Nose	8	4	2	14
Forehead	1	1	0	2
Eyelid	2	1	1	4
Nasolabial Fold	1	0	0	1
Ear	2	1	0	3
Neck	0	2	0	2
Total	27	10	5	42

Table 3: Margin involvement after first frozen section at different sites on the head and neck.

Histopathology results from formalin fixed paraffin embedded sections were in concordance with the frozen section results. Wound reconstruction was performed after the margins were deemed clear upon frozen section.

Discussion

The incidence of basal cell carcinoma is increasing with 4-8% increase per year over the last 40 years [10]. One Bcc is likely to be followed by another and the 5 year cumulative risk of developing another Bcc is 29% [1]. We have noticed an increase in the frequency of Bcc in Pakistan too but there are no studies on incidence and prevalence and no registries to quantify this increase.

Surgical excision has traditionally been the mainstay of therapy. The goal of treatment is complete removal of the tumor with conservation of normal tissue to preserve function and cosmesis [2].

Postoperative recurrence after primary Bcc has been reported as 1.7% after frozen section and 1.6% after mms which are comparable [11]. However, mms is more costly and time consuming and not widely available in our country, not even in tertiary care centres. The use of intraoperative frozen section remains an optional tool the reliability and effectiveness of which remains controversial except around the periocular areas [7]. However, using the en face frozen section technique where the entire peripheral and deep margin of the Bcc is analyzed will improve the efficiency of frozen section as compared to standard frozen section where only a portion of the peripheral and the deep margins are analyzed. In the absence of mms at our center, we are routinely using intraoperative en face frozen section for high risk cases of bcc.

In our population Bcc was seen as early as 28 years of age and as late as 83 years, the mean age of Bcc was 63.09 years + 12.77. It is almost twice as common in men (64%), as compared to women (34.8%), possibly because in our country men spend more time in the sun and women usually cover up when outdoors.

Most bccs occur on the face, consistent with the site of maximum ultraviolet radiation exposure [2]. The cheek was the commonest site of Bcc followed by the nose, less common sites were the eyelid and forehead, temple and nasolabial fold.

The risk of recurrence in Bcc after surgery is 5-15% [12]. It is less, 5% after achieving histological clearance of margins [13]. Positive margins after surgery are associated with a higher recurrence rate (26%) than those with free margins (14%) over 5 years [14]. Recurrence rate for nodular Bcc is 1% but for more aggressive lesions it is 3% [3]. Patients with nodular bcc, with margin clearance, may be discharged after a six month follow up, while those with infiltrative, morphoeic, micronodular, mixed or recurrent Bcc should be followed up for 5 years [3]. All patients are advised to be vigilant for new lesions.

Incomplete excision leads to surgery later on or prolonged follow up. Incomplete clearance has been reported more commonly in the lateral margins similar to our study. Luz et al. reported the most frequent site for incomplete excision as the nose, then ear followed by the periorbital area while in our study we found the cheek and nose were the most common sites with margin involvement (Table 4). Another study demonstrated that positive margins were most frequently found in the nasal and perioral areas. Another study conducted at one centre over 10 years found that that the margins were clear in 93% of cases. Of the involved margins 55% were lateral margins, 36% were deep margins and both lateral and deep margins were involved in 9% [14-16].

A study conducted on 145 patients with a minimum of 5 year follow up showed no recurrence in the group with intraoperative frozen

section (n=114) as compared to 3 recurrences in the group without frozen section (n=31) [3].

Total no of patients	Male	Female
96 (100%)	63 (65.6%)	33 (34.4%)

Table 4: Distribution of Bcc among genders.

Conclusion

A substantial number of our patients (43.8%) for Bcc had margin involvement on en face frozen section and required a second excision of the involved margins in the same procedure. Intra operative frozen section is a useful procedure enabling us to conserve tissue, which in turn results in a superior cosmetic result, while confirming clearance of excision margins.

Limitations

These patients were not followed up to determine the rate of recurrence post-surgical repair with and without frozen section.

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