Research Article
Basal Cell Carcinoma of the Head and Neck Region:
A Retrospective Analysis of Completely Excised 331 Cases

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The aim of the study is to analyze all completely excised BCCs in the head and neck region with regard to age, sex, personal and familial history, skin type, tumor localization and size, histopathological subtype of tumor, reconstruction method, and recurrence rates. Incompletely excised BCCs were not included in this study since incomplete excision is the most important preventable risk factor for recurrence. In 320 patients, 331 lesions were retrospectively evaluated by dividing into the following 8 subunits: scalp, frontotemporal, orbital, nose, cheek, auricula, perioral, and chin-neck area. Most of the patients were in 60–70 age group (34.7%). The nose (32.3%) was the most common site of presentation. Clinically, all lesions and, histopathologically, most of the lesions (42.2%) presented were of the nodular type. All cases of recurrence after complete excision (n = 9, 2.7%) were located in the median parts of the head and neck region and were mainly diagnosed histopathologically as sclerotic and micronodular. Even though completely excised, head and neck region BCCs, especially which are more prone to recurrence due to anatomical and histopathological properties, should be more closely monitored in order to decrease morbidity and health care costs.

1. Introduction

Basal cell carcinoma (BCC) is the most common type of skin cancer in the head and neck region. The incidence of BCC is on the rise, and it represents approximately 65% of all skin carcinomas [1–3]. BCC is not usually life threatening, unlike malignant melanoma, but it is locally invasive and may lead to considerable morbidity and complications [4]. BCC is the most frequent tumor type among the US population and also has a strongly rising incidence in Europe. Although, the incidence of BCC in Turkey is not accurately known, we think that there is a rise in the number of patients who are admitted to medical facilities [2]. With the increase in the incidence of BCC, even though mortality is relatively low, the morbidity and treatment-related costs represent a significant burden to health care systems. Treatment options include medical and surgical modalities. The first therapy of choice is generally surgical excision, with safe surgical margins. Recurrence is more common, especially with positive peripheral margins and certain types of BCC, like morpheaform forms. Recurrent BCC tends to be biologically more aggressive than primary lesions [1]. Positive surgical margins in primary BCC excisions in the head and neck region were reported to be 3–20% in the literature [5]. Recurrence rates in incompletely excised patients were also reported at 26–67% [6].

In our study, we present a case with a series of 320 patients with 331 BCCs, involving the head and neck region, and who were treated with complete surgical excision. The aim of this paper is to describe the clinical, histopathological, and epidemiological features of completely excised BCC and also to evaluate clinical features of the recurrent cases with previous histologically clear margins in the head and neck region.

2. Material and Methods

We performed a retrospective review of the database of our institution, Ataturk Training and Research Hospital, which
has a wide acceptance of patients from the capital city Ankara and surrounding cities. All patients between January 2008 and January 2013 with head and neck BCCs were evaluated. Only completely excised primary cases with histopathologically confirmed BCCs were included in this study. Patients who were lost to follow-up before one year were not included.

All 331 lesions of 320 patients were categorized with regard to age, sex, personal and family history, skin type, tumor location, size, clinical and histopathological subtypes, reconstruction method, and recurrence rates. In order to achieve a systematic analysis of the collected data, the head and neck region were divided into the following 8 subunits: scalp, frontotemporal, orbital, nose, cheek, auricula, perioral, and chin-neck area. Lesions of each subunit were evaluated according to previously mentioned variables. The diagnosis of BCC was clinically undertaken first, but, in some cases when the clinical diagnosis was not clear, the dermatologist performed a pretreatment biopsy. Most of the operations were performed under local anesthesia. Excision margins were planned, depending on the clinical features, size, and location of the lesion. With loupe (×5) magnification, the excision margin was marked in the dermatology department. While the 3 mm safe margin excision was used in small and well-defined lesions, where up to 10 mm safe margins were chosen for large tumors and unclear borders, deep margins were systematically located in the subcutaneous tissue or were more deeply situated, according to the tissue characteristics of the region. Incomplete excision was defined as a residual tumor at, or within, 1 mm of the lateral or deep incision margins. All incompletely excised lesions, whether or not they were reexcised, were excluded from the study. All excision materials underwent routine histopathological examination by the pathology department and were all confirmed as BCC. Methods of reconstruction were primary closure, skin grafts, and local and distant flaps. All patients were documented, and preoperative and postoperative photographs were taken. Routine outpatient controls were planned as postoperative one week, one month, three months, six months, and one year. Afterwards, the patients were called in for yearly one week, one month, three months, six months, and one year. Afterwards, the patients were called in for yearly routine outpatient controls were planned as postoperative and preoperative photographs were taken. Routine outpatient controls were planned as postoperative one week, one month, three months, six months, and one year. Afterwards, the patients were called in for yearly routine outpatient controls as postoperative and preoperative photographs were taken.

Statistical analysis was performed using SPSS 16.0 software (Chicago, IL, USA). Nonnormally distributed continuous variables were expressed as median, and categorical variables were expressed as numbers and percentages. Mann-Whitney U test was used in comparison with the continuous variables, while the chi-square test was used in comparison with the categorical variables. The level of statistical significance was considered as \( P < 0.05 \).

### 3. Results

A sample of 320 patients, presenting 331 histopathologically confirmed BCC of the head and neck, were identified in the retrospective review. There were 176 (55%) men and 144 (45%) women. In the whole head and neck region, there was no statistically significant difference between the male and female population. When the subunits were evaluated, scalp, frontotemporal, and auricular regions presented male predominance, while the perioral region presented female predominance \((P < 0.05)\). The mean age of the patients was \( 67.3 \pm 12.76 \). Tumors were rare below the age of 20, with only one case in the present study who revealed no history of an underlying disease such as nevoid BCC syndrome or xeroderma pigmentosum. Higher prevalence of patients \( (34.7\%) \) was noted in the 60–70 age group which was found to be statistically significant \((P < 0.05)\). There was no statistically meaningful difference noted among the subunits.

The personal history of chronic sun exposure which is defined by spending every working day in open areas due to occupational reasons was reported in \( 199 \) (62.2\%) cases. One hundred and thirty (40.6\%) patients had a coexisting systemic illness. None of the patients had a predisposing disease such as Gorlin’s syndrome or xeroderma pigmentosum. Twenty-two \( (6.8\%) \) patients had skin cancer in their family history. One hundred and twenty patients \( (37.5\%) \) were smokers for more than ten years. The Fitzpatrick classifications of the patients were type 1 in \( 9 \) (2.8\%) patients, type 2 in \( 129 \) (40.3\%) patients, type 3 in \( 165 \) (51.6\%) patients, and type 4 in \( 17 \) (5.3\%) patients, respectively. There was no significant difference in the lesions that was related to a patient's skin type, in regard to subunits (Table 1).

Tumors most commonly occurred on the nose, with \( 107 \) (32.3\%), followed by the orbital at \( 63 \) (19.1\%), cheek \( 60 \) (18.1\%), frontotemporal \( 42 \) (12.7\%), auricular \( 23 \) (6.9\%), scalp \( 21 \) (6.4\%), perioral \( 9 \) (2.7\%), and the chin-neck \( 6 \) (1.8\%) regions. The size of the tumors was analyzed in 3 groups; \( 185 \) (55.9\%) tumors were smaller than \( 10 \) mm in diameter, \( 143 \) (43.2\%) were between \( 10 \) mm and \( 30 \) mm, and \( 3 \) (0.9\%) were larger than \( 30 \) mm. In the nose and cheek regions the lesions were under \( 10 \) mm and in scalp region lesions between \( 10 \) and \( 30 \) mm were higher in number \((P < 0.05)\).

Reports of clinical evaluation showed that all of the examined primary BCCs were of the nodular type and

<table>
<thead>
<tr>
<th>Table 1: Demographic analysis of patients.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender (%)</td>
</tr>
<tr>
<td>---------------------------------------------------------------</td>
</tr>
<tr>
<td>Age</td>
</tr>
<tr>
<td>SD</td>
</tr>
<tr>
<td>Median</td>
</tr>
<tr>
<td>Range</td>
</tr>
<tr>
<td>Fitzpatrick skin type (%)</td>
</tr>
<tr>
<td>1</td>
</tr>
<tr>
<td>2</td>
</tr>
<tr>
<td>3</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>Sun exposure history (%)</td>
</tr>
<tr>
<td>Systemic illness (%)</td>
</tr>
<tr>
<td>Family history (%)</td>
</tr>
<tr>
<td>Smoking history (%)</td>
</tr>
</tbody>
</table>
were either ulcerated or pigmented. With confirmation to histopathological analyses, 46 (13.8%) were of the mixed type (nodular + micronodular); 39 (11.7%) were of the micro-
nodular type; 37 (11.2%) were of the superficial type; 31 (9.3%) were of the basosquamous type; 23 (6.9%) were of the adenoid type; 14 (4.2%) were of the sclerotic type of BCC. The rest of
the lesions 141 (42.6%) were reported as being of the nodular
type. Regarding the distribution of histopathologic patterns,
no statistically significant difference was found in the entire
head and neck region. In the scalp, frontotemporal, nose, and
cheek regions, the nodular type tumor percentage was higher
(P < 0.05). Two hundred and ninety-four excisions (88.9%)
were undertaken under local anesthesia; 37 (11.1%) were done
under general anesthesia.

The reconstruction method regarding the size of the
defect was comprised of primary closure 84 (25.4%), full
thickness skin grafting 54 (16.3%), and local flaps 192 (58%).
One defect (0.3%) was reconstructed with the radial forearm
free flap procedure (Table 2).

The mean follow-up time was at 33 ± 6.7 months. In nine
lesions of the nine patients (2.7%) recurrence was observed.
Recurrent lesions were in the scalp (n = 3), orbital (n = 2),
and nose (n = 4) regions. The histopathological subtypes of
these tumors were sclerotic (n = 4), micronodular (n = 3),
mixed (n = 1), and nodular (n = 1). The recurrence time was
between 6 months and 41 months (Table 3).

4. Discussion

BCC is the most common type of skin cancer in Caucasians,
which predominantly occurs on the exposed parts of the
body, with 75–85% of the lesions found in the head and
neck regions [1, 2, 6–9]. According to our findings, more
than half of the lesions are found in the nose (32.3%), orbital
(19.1%), and cheek (18.1%) areas which are the most central
and prominent parts of the entire head and neck region. These
regions are also more prone to chronic sunlight exposure
[2, 5, 10, 11].

Most of the BCC lesions are reported in the 40–79
age group, with the mean age of 62. In tropical regions
and in patients with family history, BCC may occur in
younger patients [2, 12]. We have had a statistically significant
increase in the 60–70 age group (34.7%), in all the head
and neck regions. But in other Mediterranean countries,
the predominance is in the 70–80 age bracket [8, 13–15].
Regarding the patient’s age and the location of the lesions,
no significant difference was found. This can be explained with
the siesta culture in these countries, which prevents their
population from rush-hour sun exposure.

Men generally have up to 2 times higher rate of BCC
[9, 10, 16]. In our study, when the whole head and neck region
is encountered, there was no statistically significant difference
between men (55%) and women (45%) that was consistent
with other studies [10, 13, 17]. Most of our patients are
from central Anatolia, where the population is generally
comprised of men and women who both work during the
daytime as farmers. When the subunits were evaluated, scalp,
frontotemporal, and auricular lesions are more common in
men, which can be explained by androgenic alopecia or short
hair on men, when compared to the long hair or kerchief
worn by women. Perioral lesions are found less in men, espe-
cially on the upper lip, which can be contributed to moustache
on men. These findings are consistent with the report
by Bastiaens et al. [18].

Phenotypic characteristics, such as fair skin type, red hair,
and freckling are risk factors for BCC [9, 19]. Most of our
patients were of type 2 (39.4%) and type 3 (51.6%), regarding
the Fitzpatrick classification. This finding is similar to the
literature [2, 10]. When the subunits were encountered, there
was no significant difference in the lesions based on the
patients’ skin type.

Most of the lesions were found to be less than 10 mm in
size (55.9%), when the whole head and neck region was eval-
uated. This finding is similar to other reports from Turkey [2].
This might be related to the recent increase in the public cog-
nition of health issues and admission numbers at health facili-
ties in Turkey. The ratio of tumors less than 10 mm was found
to be higher in cosmetically more recognized regions, such
as the nose and cheek (65.4% and 68.3%, resp.). This may be
related to the social recognizability of the lesions.

Although a universally accepted classification scheme
is lacking, commonly accepted clinical types are nodular,
superficial, fibroepitelial, and morpheaform [9, 12]. Combi-
nations of the latter three types with nodular BCC may occur.
There are also histopathologic patterns, such as nodular,
micronodular, adenoid, superficial, and sclerotic, which are
referred to as subtypes of clinical type of nodular BCC
[9, 20]. All of our patients were clinically evaluated as the
nodular type BCC; histopathologically most of the lesions
were nodular (42.2%). In the scalp, frontotemporal, nose, and
cheek regions, a higher percentage of nodular type BCC was
found.

The main goal of the BCC treatment is to eradicate
the tumor with the safest and most cost-effective method
available and to provide an aesthetically and functionally
pleasant outcome. Even though different treatment modal-
ities for BCC have been described, surgical excision is the most
commonly preferred method for tumor removal [9].

In the literature, the 3 mm peripheral surgical margin is
adequate for the clearance of 85% of small and well-defined
BCCs, and the 4-5 mm margin will raise this to 95% [5]. It has
been shown that loupe magnification can assist in reducing
incomplete excision rates [20–22]. In our practice, with loupe
magnification, the 3 to 10 mm excision margin was used,
depending on the clinical features, size, and location of the
lesion.

It has been shown that the recurrence rate for primary
BCCs after surgical excision varies between 5% and 14% [1, 5].
Lesions in the head and neck region are at more risk for
recurrence, when compared to lesions in trunk and extrem-
ities [1, 5, 7, 23]. Even though some factors, like anatomical
localization, histopathological characteristics, and initial
treatment strategy, have been proposed, there is lack of
accepted understanding in the recurrence of the lesions
[6]. Incomplete excision was reported as one of the risk
factors for recurrence [6, 10, 20, 24]. The main difference of
our study when compared with the previous studies is the
Table 2: Systematic analysis of patients' data with comparison to head and neck subunits.

<table>
<thead>
<tr>
<th>Regions</th>
<th>Age (Patients/Tumors)</th>
<th>&lt;50</th>
<th>50–60</th>
<th>60–70</th>
<th>70–80</th>
<th>80&lt;</th>
<th>Sex</th>
<th>Size (mm)</th>
<th>Histopathological subtype</th>
<th>Anesthesia Method of reconstruction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Nod</td>
<td>Mix</td>
</tr>
<tr>
<td>Scalp (21/21)</td>
<td></td>
<td>5</td>
<td>2</td>
<td>10</td>
<td>2</td>
<td>2</td>
<td>15</td>
<td>6</td>
<td>5</td>
<td>15</td>
</tr>
<tr>
<td>Frontotemporal (37/42)</td>
<td></td>
<td>5</td>
<td>4</td>
<td>17</td>
<td>12</td>
<td>4</td>
<td>31</td>
<td>11</td>
<td>20</td>
<td>21</td>
</tr>
<tr>
<td>Orbital (60/63)</td>
<td></td>
<td>6</td>
<td>11</td>
<td>21</td>
<td>19</td>
<td>6</td>
<td>30</td>
<td>33</td>
<td>32</td>
<td>31</td>
</tr>
<tr>
<td>Nose (104/107)</td>
<td></td>
<td>4</td>
<td>25</td>
<td>31</td>
<td>27</td>
<td>20</td>
<td>53</td>
<td>54</td>
<td>70</td>
<td>37</td>
</tr>
<tr>
<td>Cheek (60/60)</td>
<td></td>
<td>8</td>
<td>6</td>
<td>20</td>
<td>15</td>
<td>11</td>
<td>34</td>
<td>26</td>
<td>41</td>
<td>18</td>
</tr>
<tr>
<td>Auricula (23/23)</td>
<td></td>
<td>0</td>
<td>2</td>
<td>9</td>
<td>7</td>
<td>5</td>
<td>20</td>
<td>3</td>
<td>10</td>
<td>13</td>
</tr>
<tr>
<td>Perioral (9/9)</td>
<td></td>
<td>1</td>
<td>0</td>
<td>5</td>
<td>3</td>
<td>0</td>
<td>2</td>
<td>7</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Chin-neck (6/6)</td>
<td></td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Total (320/331)</td>
<td></td>
<td>29</td>
<td>51</td>
<td>115</td>
<td>86</td>
<td>50</td>
<td>188</td>
<td>143</td>
<td>185</td>
<td>143</td>
</tr>
</tbody>
</table>

Nod indicates nodular; Mix: mixed; Mic: micronodular; Sp: superficial; Bs: basosquamous; Ade: adenoid; Sc: sclerotic; L: local; G: general; P: primary repair; G: full thickness skin graft; LF: local flap; and DF: distant flap.
Table 3: Clinical features of recurrent BCC.

<table>
<thead>
<tr>
<th>Regions</th>
<th>Specific localization</th>
<th>Age</th>
<th>Sex</th>
<th>Size (mm)</th>
<th>Histopathologic tumor type</th>
<th>Recurrence time</th>
<th>Treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Scalp</td>
<td>Left parietal</td>
<td>64</td>
<td>M</td>
<td>10–30</td>
<td>Nodular</td>
<td>36 months</td>
<td>Total excision</td>
</tr>
<tr>
<td>2 Scalp</td>
<td>Left parietal</td>
<td>66</td>
<td>F</td>
<td>&lt;10</td>
<td>Sclerotic</td>
<td>25 months</td>
<td>Total excision</td>
</tr>
<tr>
<td>3 Scalp</td>
<td>Right parietal</td>
<td>62</td>
<td>M</td>
<td>10–30</td>
<td>Micronodular</td>
<td>41 months</td>
<td>Total excision</td>
</tr>
<tr>
<td>4 Orbital</td>
<td>Left medial canthus</td>
<td>63</td>
<td>M</td>
<td>10–30</td>
<td>Sclerotic</td>
<td>8 months</td>
<td>Total excision</td>
</tr>
<tr>
<td>5 Orbital</td>
<td>Right medial canthus</td>
<td>73</td>
<td>F</td>
<td>10–30</td>
<td>Sclerotic</td>
<td>6 months</td>
<td>Total excision</td>
</tr>
<tr>
<td>6 Nose</td>
<td>Dorsum</td>
<td>68</td>
<td>M</td>
<td>&lt;10</td>
<td>Micronodular</td>
<td>18 months</td>
<td>Total excision</td>
</tr>
<tr>
<td>7 Nose</td>
<td>Right alar region</td>
<td>73</td>
<td>F</td>
<td>&lt;10</td>
<td>Sclerotic</td>
<td>20 months</td>
<td>Total excision</td>
</tr>
<tr>
<td>8 Nose</td>
<td>Nose tip</td>
<td>71</td>
<td>F</td>
<td>&lt;10</td>
<td>Mixed</td>
<td>22 months</td>
<td>Total excision</td>
</tr>
<tr>
<td>9 Nose</td>
<td>Left alar region</td>
<td>79</td>
<td>M</td>
<td>&lt;10</td>
<td>Micronodular</td>
<td>9 months</td>
<td>Total excision</td>
</tr>
</tbody>
</table>

precise evaluation of the factors effective on recurrence in completely excised BCCs. In our series, the overall recurrence rate was 2.7%. Recurrent lesions were in the scalp (n = 3), orbital (n = 2), and nose (n = 4) regions. Interestingly, all recurrences were in the median parts of head and neck region; this may be attributed to high recurrence rates in embryonic fusion planes [9, 25–27]. Histopathological subtype of recurrent tumors was mainly micronodular and sclerotic, which is more difficult to eradicate and has high risk of recurrence [28].

Our study revealed that recurrence is related to the localization and histopathologic subtype, whereas they were not related to age, sex, and size of the lesion. The low recurrence rates in our series might be due to the relatively low rates of histopathologically aggressive subtypes, excision with appropriate margin, and no positive surgical margins after surgery.

5. Conclusion

In conclusion, this study presents a relatively large number of series of surgically treated BCCs in the head and neck region. We would like to emphasize the importance of the preoperative evaluation of the patient keeping the epidemiology in mind, defining the surgical margins in order to get lower recurrence rates, and by motivating the patient for follow-up visits, in order to evaluate outcomes and diagnose recurrences.

Conflict of Interests

The authors declare that there is no conflict of interests regarding the publication of this paper.

References


