bad national audit on non-melanoma skin cancer excision 2014

INTERIM REPORT – MAY 2015

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Summary

A total of 227 responses from 135 centres reported 2739 excisions, with 58.4% of data collected prospectively and the rest retrospectively. Excisions from the head and neck accounted for 58.3% of cases, with 41.7% from other sites. The mean tumour diameter was 10.61 mm (SD 6.9 mm, maximum 130 mm) and 96.7% of cases were excisions with 3.3% re-excisions. Clinically diagnosed BCCs accounted for 79.1% (2167) of total cases and SCCs 17.9% (491). Of the suspected BCCs, 94.4% (2045) were confirmed histologically and confirmed BCCs 6.0% (123/2045) and SCCs 6.4% (21/328).

Histologically confirmed cases of BCC lateral margins were clear in 98.3% (1906/1938, broken down to 5.0% <1 mm, 85.9% 1-5 mm, 7.5% >5 mm). BCC deep margins were clear in 99.2% (1886/1901, broken down to 6.8% <1 mm, 76.0% 1-5 mm, 16.4% >5 mm). SCC lateral margins were clear in 98.4% (300/305, broken down to 2.3% <1 mm, 69.8% 1-5 mm, 26.2% >5 mm). SCC deep margins were clear in 97.1% (236/238, broken down to 5.6% <1 mm, 75.4% 1-5 mm, 16.1% >5 mm). Larger tumours tended to have greater clearance. Reported surgical complication rate in the audit was 3.4%.

Introduction / Background

Non-melanoma skin cancers (NMSCs) including basal cell carcinoma (BCC) and squamous cell carcinoma (SCC) are common cancers affecting large numbers of the population. Diagnosis and management of skin cancer represents a large part of Dermatology workload. Excision surgery is the most common form of treatment for skin cancer (NICE IOG 2006). Complete excision is a required standard for definitive treatment with excision surgery. Co-morbidities and indicators of complexity (site and size of tumour and nature of wound repair) are necessary elements in data collection for cancer surgery to establish context and casemix.

Methodology

A surgical audit log spreadsheet was circulated to BAD and BSDS members in the United Kingdom via email (Figure 1). Members were asked to collect, prospectively (where possible), data for 10 consecutive non-Mohs excisions of non-melanoma skin cancer (predominantly SCC and BCC). This was carried out from 1st January 2014 with a final deadline for submission of data of 9th May 2014.

Data collection included details to provide context and define casemix. Variables included pre-surgery diagnosis, proximity to previous skin cancer, risk factors for bleeding and infection, presence of pacemaker or implantable defibrillator, tumour diameter, type of excision, clinical margin taken, type of closure, histological diagnosis, deep and lateral margins, and complications.

Submitted data was amalgamated. Statistical analysis was conducted in STATA 13 (©2015 StataCorp LP, Texas, USA) and R v3.1.3 (©2015 The R Foundation for Statistical Computing, Vienna, Austria).

Tumours were broken down by site: 1. Cheek or chin 2. Ear (or within 2 cm) 3. Genitalia, perineum or perianal 4. Hand or foot 5. Nose (or within 1 cm) or lips 6. Other limb 7. Periocular, temple, forehead or eyebrow 8. Scalp or neck 9. Trunk

Pre-operative clinical and post-operative histological diagnoses were compared for percentage agreement and examined separately for retrospective and prospective data collection. This could reveal any case selection bias by this criterion, if any existed.

For those lesions where the pre- and post-operative diagnoses disagreed, the histological diagnosis was taken as definitive and subsequent breakdown of data and analyses were based on confirmed BCC or SCC diagnoses only.

The reported maximum tumour diameter was calculated and plotted on a density distribution. Types of excision were recorded: excision and re-excision. We examined the complication rate of re-excision vs. excision, and the proportion of re-excision performed at different body sites. Tumours recorded to be within 10 mm of a previous scar were classified as possible recurrent lesions.

Histological deep and peripheral margins were examined according to prospective and retrospective data gathering to assess bias. Peripheral margins were analysed by tumour size, site and bleeding risk factors to determine association.

Results

A total of 227 responses were received (consultants (69.7%), associate specialists, registrars, GPwSIs, nurses and others) at 135 identifiable centres. 2739 patient procedures were recorded. The spread of participants from different regions in the UK is shown in Figure 2 overleaf.

Of all submitted data, 58.4% was collected prospectively.
Excision sites
A total of 2738 episodes recorded information about excision site. The procedures were carried out most commonly on the head and neck (58.3%), reflecting the propensity for skin cancer to affect sun-exposed sites.

Pre- / Post-operative diagnosis
More than three quarters of the 2739 procedures were carried out for BCC (79.1% suspected, 77.7% histological diagnosis) with SCC the second most common tumour (17.9 suspected, 14.0% histological diagnosis; Figure 5). Table 1 shows the percentage agreement between pre- and post-operative diagnoses. Overall, for BCC there is 94.4% agreement, SCC 66.8% agreement and other NMSC 15.7% agreement. This is further broken down between prospective and retrospective data.

<table>
<thead>
<tr>
<th>TYPE OF PROCEDURE</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excision</td>
<td>2650</td>
<td>96.75</td>
</tr>
<tr>
<td>Re-excision</td>
<td>89</td>
<td>3.25</td>
</tr>
</tbody>
</table>

Table 2. Types of procedure

Table 3 shows the number of complications for excisions and re-excisions respectively.

<table>
<thead>
<tr>
<th>COMPLICATIONS</th>
<th>EXCISION</th>
<th>RE-EXCISION</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>2233 (97%)</td>
<td>75 (94%)</td>
<td>2308 (96.6%)</td>
</tr>
<tr>
<td>Yes</td>
<td>75 (3%)</td>
<td>5 (6%)</td>
<td>80 (3.4%)</td>
</tr>
<tr>
<td>Total</td>
<td>2308</td>
<td>80</td>
<td>2388</td>
</tr>
</tbody>
</table>

Table 3. Reported complication rate

The risk ratio of complications for re-excision was 1.92 (95% CI 0.80-4.62, P=0.18); statistical significance (P<0.05) was not reached.

Location in relation to previous scar
Location of BCCs and SCCs within 10 mm of previous excision scars was mapped (Figure 8). BCCs close to previous scars were most likely to be in the periocular/temporal area and on the trunk, whilst SCCs were most likely to be on the limbs.

Tumour size
A total of 2388 recorded procedures provided usable information about tumour size. The mean tumour diameter was 10.61 mm (standard deviation 6.92 mm), with the largest diameter being 130 mm. The density distribution plot shows a positive skew (+4.8), where most tumours were under or equal to 20 mm.

<table>
<thead>
<tr>
<th>TYPE</th>
<th>NO. OF CASES</th>
<th>% CORRELATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>2384/2728</td>
<td>87.1</td>
</tr>
<tr>
<td>– prospective</td>
<td>1377/1600</td>
<td>86.1</td>
</tr>
<tr>
<td>– retrospective</td>
<td>999/1128</td>
<td>88.6</td>
</tr>
<tr>
<td>BCC</td>
<td>2045/2167</td>
<td>94.4</td>
</tr>
<tr>
<td>– prospective</td>
<td>1149/1227</td>
<td>93.6</td>
</tr>
<tr>
<td>– retrospective</td>
<td>889/932</td>
<td>95.4</td>
</tr>
<tr>
<td>SCC</td>
<td>328/491</td>
<td>66.8</td>
</tr>
<tr>
<td>– prospective</td>
<td>220/336</td>
<td>65.5</td>
</tr>
<tr>
<td>– retrospective</td>
<td>107/153</td>
<td>69.9</td>
</tr>
<tr>
<td>Other NMSCs</td>
<td>11/70</td>
<td>15.7</td>
</tr>
<tr>
<td>– prospective</td>
<td>8/37</td>
<td>21.6</td>
</tr>
<tr>
<td>– retrospective</td>
<td>3/33</td>
<td>9.1</td>
</tr>
</tbody>
</table>

Table 1. Overall pre- and post-operative agreement in diagnoses with prospective and retrospective breakdown of data

Where suspected BCC was found to be another diagnosis on histological examination, the most common diagnoses were benign lesions and SCC. Where suspected SCC was found to be something else the most common histological diagnosis was BCC. Melanoma was present as a very rare (<3%) unexpected diagnosis in both groups.

Tumour size and margin
As expected, tumour size has some influence on excision margin. In the graphs below (Figures 10 and 11) larger tumour sizes are more likely to be excised with margins >5 mm compared with smaller tumours.

Completeness of excision
Based on histological diagnoses of BCC, 2001 and 1965 submissions had analysable data for lateral and deep margins, respectively. A total of 32 BCCs were incompletely excised at the lateral margin and 15 were incomplete at the deep, leading to complete excision rates of 98.4% and
99.2% lateral and deep, respectively. The complete excision rates based on histologically confirmed SCC diagnoses were virtually identical (lateral – 98.3% (1906/1938) total, broken down to 5.0% <1 mm, 85.9% 1-5 mm, 7.5% >5 mm; deep – 99.2% (1886/1901) total, broken down to 6.8% <1 mm, 76.0% 1-5 mm, 16.4% >5 mm).

Based on histological diagnoses of SCC, 348 and 349 submissions had analysable data for lateral and deep margins, respectively. A total of 7 SCCs were incompletely excised at the lateral margin and 14 were incomplete at the deep, leading to complete excision rates of 98.0% and 96.0% lateral and deep, respectively. The complete excision rates based on histologically confirmed SCC diagnoses were very similar (lateral – 98.4% (300/305) total, broken down to 2.3% <1 mm, 69.8% 1-5 mm, 26.2% >5 mm; deep – 97.1% (296/305) total, broken down to 5.6% <1 mm, 75.4% 1-5 mm, 16.1% >5 mm).

Based on all histological lesions recorded, 2445 and 2400 had analysable data for lateral and deep margins, respectively. Overall complete excision rates were calculated at 98.2% lateral and 98.7% deep, respectively. For BCC and SCC (excluding other diagnoses) the overall complete excision rate (lateral or deep or both) was 97.7%.

**Conclusions / Discussion**

We have examined the completeness and margins of excision undertaken by dermatological surgeons in secondary care for NMSCs from a variety of body sites with 58.3% from the head and neck. The majority of NMSC excisions are for BCC and SCC.

A total of 94.4% of clinically suspected BCCs were confirmed histologically and 66.8% of suspected SCCs. These are at the upper range of previously published figures on diagnostic accuracy for NMSCs being seen in secondary care settings (89.0-95.4% for BCC and 33.0-68.0% for SCC).2,6

The most common alternative diagnosis for BCC was benign lesions or SCC, and for SCC was BCC.

The largest single lesion recorded was 130 mm but most tumours are less than 20 mm (mean 10.6 mm, SD 6.9) in diameter. This matches the average size of lesions at presentation in most dermatology departments. With clinical margins of 4 to 6 mm according to tumour type and location, this will result in defects of 18.6 to 22.6 mm, mostly on the head and neck.

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**Figure 5. Pre-operative clinical diagnosis vs. histological diagnosis**

**Figure 6. Final histological diagnoses where clinical diagnoses were corrected by histology result**

**Figure 7. Distribution plot of tumour size**

**Figure 8. Mapping of tumour site to presumed recurrences according to tumour type**
The majority of procedures were primary excisions. Most patients are not followed up in secondary care, which means complication rates probably go under-reported. Higher rates of re-excision were observed on the ear, hand/foot and scalp/neck. This may reflect increased difficulty of excision leading to higher rates of incomplete excision.

This audit has provided an assessment of the completeness of non-Mohs excision of NMSCs in secondary care in the United Kingdom. Tumour size, site and co-morbidities provide context for interpretation.

References