Efficacy of Curettage Before Excision in Clearing Surgical Margins of Nonmelanoma Skin Cancer

Katarina Chiller, MD, MPH; Douglas Passaro, MD, MPH; Timothy McCalmont, MD; Kirsten Vin-Christian, MD

Objective: To determine whether curettage before excision of basal cell carcinoma (BCC) and squamous cell carcinoma (SCC) improves margin clearance rates.

Design: A retrospective, nonrandomized, case-control series of nonmelanoma skin cancers treated with preexcisional curettage followed by simple excision was identified using a computerized search of the database of a dermatopathology service. A validation cohort was established by manually identifying nonmelanoma skin cancers treated with wide excision on a given day.

Setting: All analyzed specimens were derived from the Dermatopathology Service at the University of California, San Francisco, a university-based laboratory that provides interpretation of skin biopsy specimens received directly from community (90%) and academic (10%) practices.

Patients: Our retrospective cohort consisted of all nonrecurrent nonmelanoma skin cancers diagnosed by biopsy and treated by simple excision between April 1, 1997, and April 30, 1999. There were 1983 BCCs and 849 SCCs included in our study. The validation cohort included skin cancers diagnosed by biopsy treated with simple excision on the 16th day of each month during the same period.

Intervention: Preexcisional curettage.

Main Outcome Measure: We compared the frequency of tumor margin involvement of curetted vs noncuretted lesions. Margin involvement was considered surgical failure.

Results: Forty-two percent of BCCs and 34% of SCCs were curetted before excision. In BCC, risks for surgical failure included head and neck lesions (P < .001), lesions treated by physicians performing fewer than 51 procedures (P < .001), and invasive subtypes (P < .01). Factors associated with surgical failure in SCC included in situ disease (P = .01) and an older (77 vs 74 years) patient population (P = .05). In univariate analysis, curettage before excision decreased the surgical failure rate for BCC by 24% (P = .03) but did not decrease the rate for SCC (P = .8). In multivariate analysis, curettage of BCC reduced surgical failure rates by 26% when the physician performed 50 skin cancer excisions or less during the study (odds ratio, 0.74; 95% confidence interval, 0.57-0.95; P = .02).

Conclusion: Preoperative curettage decreases the frequency of positive margins in the management of BCC but not of SCC.

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The incidence of basal cell carcinoma (BCC) and squamous cell carcinoma (SCC) has dramatically increased during the past decade.1-3 Studies4-24 showing variable cure rates depending on lesion size, microscopic subtype, anatomic location, recurrence status, and type of therapeutic management have provided the clinician with important information. Standards regarding “safety” margins for excision of tumors with differing invasiveness have been established. Special techniques have been developed to improve cure rates provided by more standard therapies such as the use of immunohistochemistry in the setting of Mohs micrographic surgery for the treatment of recalcitrant tumors.25-28

Curettage before excision of BCC and SCC is frequently used.29-31 Nonetheless, rationale for curettage before excision is largely anecdotal, without significant literature to demonstrate a comparative beneficial impact on treatment outcome. Curettage consists of the use of a sharp, round-tipped instrument to scrape the involved skin surface with the intent of removing poorly adherent tissue, such as that formed by malignant cells. The notion exists that curettage may assist the surgeon in better defining the tumor border such
RESULTS

GENERAL

Our search strategy yielded 2832 lesions from 2167 patients treated by 135 dermatologists.

Of 1983 BCC lesions, 821 (41%) were in women. Mean age at treatment for these tumors was 68.5 years. The head and neck region contained 1092 lesions (35%). Nearly one third of the lesions (32%) were invasive (Table 1). Treating dermatologists performed a mean of 137 BCC excisions (range, 1-333); 69% of BCC lesions were performed by physicians who had done more than 50 procedures (MD>50 group) during the 25-month study.

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of 146 SCC excisions (range, 1-353); 72% of all SCC excisions were performed by the MD>50 group.

**TREATMENT SUBGROUPS**

Basal cell carcinomas were more often curetted than were SCCs (841 [42%] of 1983 vs 290 [34%] of 849; P<.001). Not-otherwise-specified BCC lesions were curetted more frequently than all other subtypes (54%; 40% vs 18%; P=.001), as were head and neck BCC lesions compared with all other locations (45%; P=.02) (Table 1). The most invasive subtypes of BCC were less frequently curetted (37% in infiltrative BCC; P=.02) (Table 1). The MD>50 group curetted more frequently than the MD<51 group (46% vs 30%; P<.001). Median age and the sex distribution were similar in the 2 treatment groups.

For SCC, the curetted treatment group consisted of 290 lesions (34%). In situ SCCs were curetted more frequently than other subtypes (37%; P=.05), as were head and neck SCCs (38%; P=.02) (Table 2). The MD>50 group curetted more frequently than the MD<51 group (40% vs 18%; P<.001). Median age was significantly greater in the SCC curetted group (77 years; P=.02) (Table 2). The sex distribution was similar in the 2 treatment groups.

<table>
<thead>
<tr>
<th>Subgroup</th>
<th>All BCC Lesions (n = 1983)</th>
<th>Lesions Curetted† (n = 841)</th>
<th>Lesions With Positive Margins† (n = 304)</th>
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</thead>
<tbody>
<tr>
<td>Sex</td>
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<td></td>
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</tr>
<tr>
<td>Male</td>
<td>1162 (59)</td>
<td>474 (41)</td>
<td>195 (16)</td>
</tr>
<tr>
<td>Female</td>
<td>821 (41)</td>
<td>367 (45)</td>
<td>119 (15)</td>
</tr>
<tr>
<td>Age, mean (range), y</td>
<td></td>
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</tr>
<tr>
<td>68.5 (30-93)</td>
<td>69.4 (32-91)</td>
<td>71.2 (29-94)</td>
<td></td>
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</table>

**Table 1. Distribution of 1983 Basal Cell Carcinoma (BCC) Lesions**

<table>
<thead>
<tr>
<th>Subgroup</th>
<th>All SCC Lesions (n = 849)</th>
<th>Lesions Curetted† (n = 290)</th>
<th>Lesions With Positive Margins† (n = 95)</th>
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</thead>
<tbody>
<tr>
<td>Sex</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>464 (55)</td>
<td>149 (32)</td>
<td>53 (11)</td>
</tr>
<tr>
<td>Female</td>
<td>385 (45)</td>
<td>141 (37)</td>
<td>42 (11)</td>
</tr>
<tr>
<td>Age, mean (range), y</td>
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<tr>
<td>74.9 (37-94)</td>
<td>76.7 (39-93)</td>
<td>77 (42-94)</td>
<td></td>
</tr>
</tbody>
</table>

**Table 2. Distribution of 849 Squamous Cell Carcinoma (SCC) Lesions**

*TREATMENT FAILURE*

The overall surgical failure for BCC specimens was associated with invasive histologic features (22% in micronodular BCC; P<.001; 18% in infiltrative BCC; P=.02; 50% in morpheaform BCC; P<.001; and 20% in all invasive BCC lesions; P= .01). Failure rates were also associated with the MD<51 group (21%; P<.001) and location on the head and neck (20%; P<.001) (Table 1). As expected by the intrinsic definition of this subgroup, not-otherwise-specified BCC lesions had significantly less tumor margin involvement (5%; P<.001) (Table 1). With respect to the 659 lesions that had sufficient carcinoma on both biopsy and excisional specimens to establish histologic correlation, failure rates were increased compared with the entire BCC population (Table 3). This finding results from tumor being present on the excisional specimen, an inherent characteristic of this subgroup.

Surgical failure in SCC specimens was associated with in situ SCC lesions (14%; P=.01) (Table 2) and with an older patient population (77 years for margin involvement vs 74 years for tumor-free margins; P=.05). The surgical failure rate in the in situ SCC lesions was itself associated with an older population (77.5 years for margin involvement vs 74.5 years for tumor-free margins; P=.02). As expected, surgical margin involvement was less frequently observed in not-otherwise-specified SCC (4%; P<.01) (Table 2).

**EFFECTS OF CURETTAGE BEFORE EXCISION**

In univariate analysis, curettage before excision of BCC decreased surgical failure from 17% to 13% (risk reduc-
Curettage did not affect overall tumor margin involvement (P = .6) (Table 3). This held true regardless of lesion invasiveness and location, patient sex and age, and number of procedures performed by the treating physician.

### EFFECTS OF CHANGE IN MICROSCOPIC PATTERN

Of 659 lesions for which both biopsy and excisional subtypes were identified, 276 (42%) had a change in subtype and 383 were unchanged. Of those that changed, 109 had an upgrade, with a mean relative invasiveness score change of 1.6, whereas 167 had a downgrade, with a mean relative invasiveness score change of −1.5. There was no difference in tumor margin involvement between lesions that upgraded and lesions that downgraded or between lesions that exhibited or did not exhibit a change in microscopic pattern. This finding was unaltered by curettage (Table 3).

Curettage was associated with increased surgical failure rates (17% vs 26%; P = .04) in the 383 unchanged lesions (Table 3). However, this association is the result of curetted lesions within this subgroup being more invasive (41% of curetted lesions vs 27% of noncuretted lesions; P<.01) and being more often located on the head and neck (36% of curetted lesions vs 26% of noncuretted lesions; P=.03). In a multivariate model including head and neck location and lesion invasiveness, lack of change in microscopic pattern did not increase surgical failure rates in curetted specimens (risk reduction, 1.20; 95% confidence interval, 0.81-1.78; P = .4).

### VALIDATION COHORT

Our validation cohort consisted of 115 lesions identified using a manual search. Of these, 94 (82%) were identified using both methods and 21 were identified manually only (18%). When accounting for sex, age, anatomic location, lesion subtype, MD<51 group, and frequency...
of margin involvement, there were no significant differences between the group found by manual search only and the group found by both search types. There was a significant increase in the number of noncuretted excisions in the manually identified subgroup (47% for manual search vs 33% for both search types; \( P = .01 \)).

**COMMENT**

Use of curettage before excision in the treatment of nonmelanoma skin cancer is a relatively easy and safe adjunct used by many dermatologists.\(^9\),\(^10\) We report the first systematic investigation of the surgical failure rates between curetted and noncuretted excisional specimens. The sex, age, and anatomic distributions of the lesions in this series were similar to those reported in the literature.\(^1\),\(^3\),\(^7\),\(^19\)

Our lesion selection method was supported by the findings in a validation cohort. This cohort revealed a higher frequency of noncuretted specimens compared with our study population. This finding is likely the result of manual identification of excisional biopsies (an excision performed with intent to cure when no previous biopsy had been performed). The difficulty of distinguishing these particular biopsies from a simple biopsy using a computer-based search led to their exclusion from our study population. This might have led to selection bias against surgical failures in the noncuretted treatment group, thereby increasing the relevance of preexcisional curettage.

In our series, most lesions (70%) were treated by physicians who had done more than 50 procedures. Lesions treated by this group were more frequently curetted. Also, not-otherwise-specified subtypes of BCC were more frequently curetted. A degree of uncertainty with respect to these lesions’ invasive potential may be a motivating factor in using curettage.

In BCC, our retrospective cohort revealed that surgical failure was associated with greater tumor invasiveness, head and neck location, and physicians performing fewer than 51 procedures. Based on the assumption that physicians performing fewer than 51 procedures were dermatologists with less surgical experience, it is not surprising that an increased surgical failure rate was observed in lesions treated by these physicians. Nevertheless, it is impossible to certify that some dermatologists in our study did not submit surgical specimens to other pathology laboratories, and, therefore, the accessioning of less than 30 lesions through our database might not reflect the full surgical activity of a specific physician.

Surgical failure in SCC lesions was associated with an older patient population. This phenomenon was specific to in situ SCC. Head and neck SCC lesions were also associated with this older population (\( P < .001 \) for head and neck). Being independently related to surgical failure, this location might be responsible for the tendency for increased surgical failure rates in this patient population.

Unlike BCC, invasive SCC tended to have fewer positive excisional margins. This finding may indicate a more careful approach in the extirpation of these potentially more morbid lesions. On the other hand, the decrease in surgical failure rates noted in not-otherwise-specified lesions of either BCC or SCC was likely the result of the definition of this subgroup because not-otherwise-specified lesions did not have enough (or any) residual carcinoma at the margins.

Surgical failure was not significantly related to the ability of the biopsy to predict the pattern of the carcinoma in the excisional specimen, as upgrade, downgrade, and unchanged pattern showed no impact on cure. Type of biopsy performed, whether punch or shave, was not accounted for in our study because this has not been shown to affect assessment of pattern.\(^3\) The relative increase in surgical failure noted in these subgroups is a direct result of their inclusion criteria. Multivariate analysis showed that an unexpected increase in the surgical failure rate in the curetted lesion with unchanged microscopic pattern could be accounted for by the over-representation of infiltrative subtypes and head and neck location.

Our data, which show curettage to be a relatively common technique used in the treatment of nonmelanoma skin cancers, offers a 24% reduction in surgical failure rates in the treatment of BCC. This reduction was even higher when accounting for tumor invasiveness and location, patient sex and age, and physician expertise. Benefits could be specifically noted in noninvasive BCC, in younger patient populations, or in the hands of less experienced physicians. We were unable to account for the width of safety margins applied by each surgeon on extirpation. This has been reported to significantly impact the frequency of cure\(^10\),\(^30\) and represents an area for further study. Nevertheless, the ease with which curettage can be performed and the significant improvement in the surgical failure rate when this technique is applied in treatments of BCC should be an incentive for practitioners to adopt this technique.

On the other hand, curettage showed no benefit in the treatment of SCC. We suspect that subclinical extension of tumor could have misled the clinician into underestimating the size of the lesion. Furthermore, we theorize that SCC differs from noninvasive BCC in that SCC invades as small nests in the absence of mucinous stroma and therefore does not loosen as readily from its surrounding matrix as would BCC. Thus, although preexcisional curettage of SCC does no harm, it may not improve surgical cure rates.

A similar and more striking finding was an increase of tumor margin involvement in curetted BCC lesions that did not exhibit a change in microscopic pattern. As shown by our data, the marked propensity for these curetted lesions to be invasive and on the head and neck may explain our findings. Thus, curettage before excision of more aggressive tumors of the head and neck region is not an appropriate substitute for Mohs surgery.

Curettage before excision is a simple technique that has been demonstrated to impart a definite decrease in the rate of tumor margin involvement of BCC surgical excisional specimens. Its relative ease of use renders it an excellent tool to teach to beginning physicians in an attempt to assist them in better defining tumor margins and achieving higher surgical cure rates.