

# Surgical Specimens and Margins

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## PRACTICE POINTS

- Margin analysis in simple excisions can provide useful information by proxy about more than the 1% of the margin often quoted in the literature.
- Simple excisions of uncomplicated keratinocytic carcinomas are associated with high cure rates.

We have attended grand rounds presentations at which students announce that Mohs micrographic surgery evaluates 100% of the surgical margin, whereas standard excision samples 1% to 2% of the margin; we have even fielded questions from neighbors who have come across this information on the internet.<sup>1-5</sup> This statement describes a best-case scenario for Mohs surgery and a worst-case scenario for standard excision. We believe that it is important for clinicians to have a more nuanced understanding of how simple excisions are processed so that they can have pertinent discussions with patients, especially now that there is increasing access to personal health information along with increased agency in patient decision-making.

## Margins for Mohs Surgery

Theoretically, Mohs surgery should sample all true surgical margins by complete circumferential, peripheral, and deep-margin assessment. Unfortunately, some sections are not cut full face—sections may not always sample a

complete surface—when technicians make an error or lack expertise. Some sections may have small tissue folds or small gaps that prevent complete visualization. We estimate that the Mohs sections we review in consultation that are prepared by private practice Mohs surgeons in our communities visualize approximately 98% of surgical margins on average. Incomplete sections contribute to the rare tumor recurrences after Mohs surgery of approximately 2% to 3%.<sup>6</sup>

## Standard Excision Margins

When we obtained the references cited in articles asserting that standard excision samples less than 0.5%, 1%, or 2% of the surgical margin, we did not find evidence-based information confirming this generally accepted conclusion. We believe the assertions are derived by comparing the sum of the thickness of all microscopic sections added together against the longitudinal length of the entire specimen. Sampling less than 0.5% of a margin has been described as providing the illusion of microscopic control.<sup>5</sup> We have encountered medical students, nondermatologist physicians, and patients who have come across this information and have understandably concluded that standard margin assessment must be inadequate if only such a small amount of margin is assessed.

Here is a simple example to show that more margin is accessed in some cases. Consider this hypothetical situation: If a tumor can be readily visualized grossly and housed entirely within an imaginary cuboid (rectangular) prism that is removed in an elliptical specimen with

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a length of 6 cm, a width of 2 cm, and a height of 1 cm (Figure), then standard sectioning assesses a greater margin.

Bread-loaf sectioning would be expected to examine the complete surface of 2 sides (faces) of the cuboid. Assessing 2 of the 5 clinically relevant sides provides information for approximately 50% of the margins, as sections in the next parallel plane can be expected to be clear after the first clear section is identified. The clinically useful information is not limited to the sum of the widths of sections. Encountering a clear plane typically indicates that there will be no tumor in more distal parallel planes. Warne et al<sup>6</sup> developed a formula that can accurately predict the percentage of the margin evaluated by proxy that considers the curvature of the ellipse.

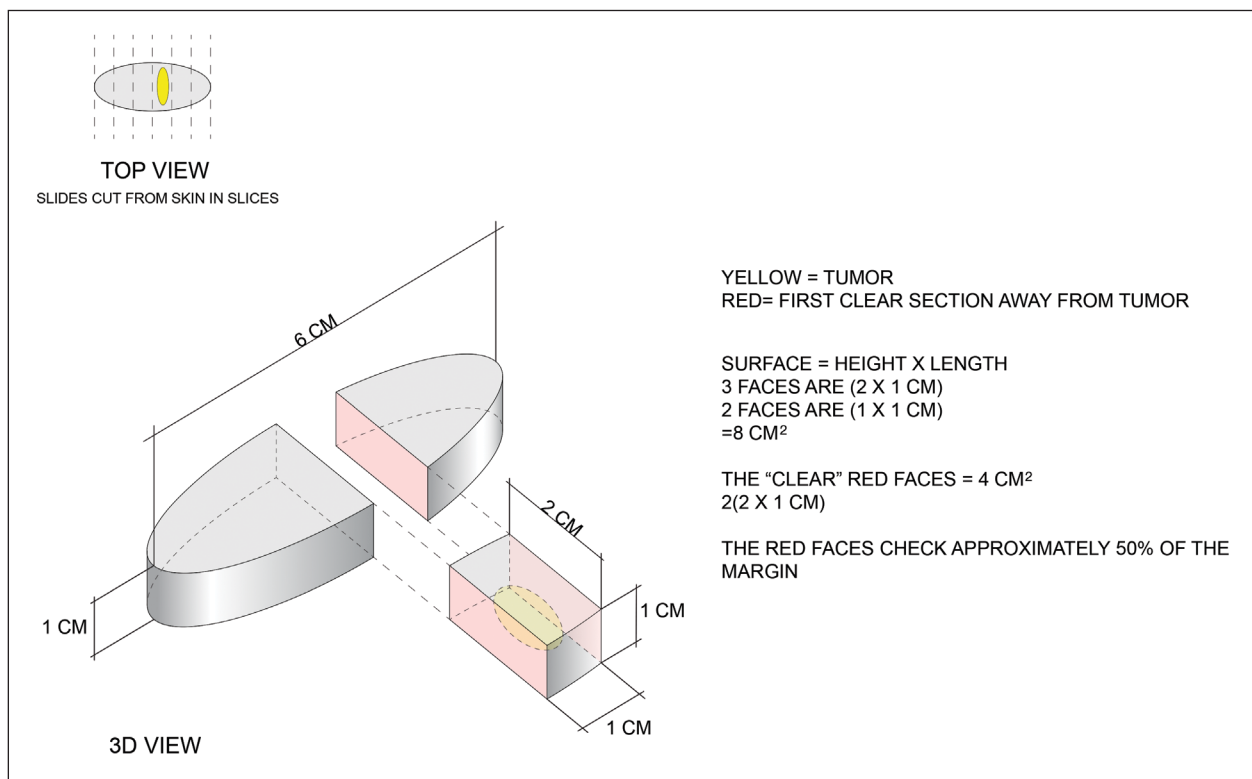
### Comparing Standard Excision and Mohs Surgery

Mohs surgery consistently results in the best outcomes, but standard excision is effective, too. Standard excision is relatively simple, requires less equipment, is less time consuming, and can provide good value when resources are finite. Data on recurrence of basal cell carcinoma after simple excision are limited, but the recurrence rate is reported to be approximately 3%.<sup>7,8</sup> A meta-analysis found that the recurrence rate of basal cell carcinoma treated with standard excision was 0.4%, 1.6%, 2.6%,

and 4% with 5-mm, 4-mm, 3-mm, and 2-mm surgical margins, respectively.<sup>9</sup>

Mohs surgery is the best, most effective, and most tissue-sparing technique for certain nonmelanoma skin cancers. This observation is reflected in guidelines worldwide.<sup>10</sup> The adequacy of standard approaches to margin evaluation depends on the capabilities and focus of the laboratory team. Dermatopathologists often are called to the laboratory to decide which technique will be best for a particular case.<sup>11</sup> Technicians are trained to take more sections in areas where abnormalities are seen, and some laboratories take photographs of specimens or provide sketches for correlation. Dermatopathologists also routinely request additional sections in areas where visible tumor extends close to surgical margins on microscopic examination.

It is not simply a matter of knowing how much of the margin is sampled but if the most pertinent areas are adequately sampled. Simple sectioning can work well and be cost effective. Many clinicians are unaware of how tissue processing can vary from laboratory to laboratory. There are no uniformly accepted standards for how tissue should be processed. Assiduous and thoughtful evaluation of specimens can affect results. As with any service, some laboratories provide more detailed and conscientious care while others focus more on immediate costs. Clinicians should



Determining that the 5 surfaces representing the true surgical margins are clear provides critical information about the adequacy of an excision. In this example of a tumor nested in a rectangular prism, bread-loaf sections provide information about 50% of the margins. This is less than Mohs surgery but more than the 1% to 2% often quoted in the literature. Illustration courtesy of Ava I. Helm, BACh (Washington, DC).

understand how their specimens are processed by discussing margin evaluation with their dermatopathologist.

### Final Thoughts

Used appropriately, Mohs surgery is an excellent technique that can provide outstanding results. Standard excision also has an important place in the dermatologist's armamentarium and typically provides information about more than 1% to 2% of the margin. Understanding the techniques used to process specimens is critical to delivering the best possible care.

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