

Clinical Pearl: Mohs Cantaloupe Analogy for the Dermatology Resident

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Mohs micrographic surgery (MMS) is a challenging procedure to conceptualize, yet it is an integral component of dermatology residency. The cantaloupe analogy is a tool that can be used to assist in visualizing MMS specimen processing, which transitions the 3-dimensional multilayered skin to a 2-dimensional histologic slide.

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Practice Gap

Mohs micrographic surgery (MMS) is a highly curative tissue-sparing skin cancer treatment¹ and is a required component of dermatology residency training. According to the Accreditation Council for Graduate Medical Education, residents must have exposure “either through direct observation or as an assistant in Mohs micrographic surgery, and reconstruction of these defects, to include flaps and grafts.”² The MMS technique allows for complete circumferential peripheral and deep margin assessment of excised specimens; however, the conformation of a 3-dimensional gross tissue specimen into a 2-dimensional specimen as represented on a microscope slide is challenging to conceptualize.

Behavioral science research has shown that analogies and metaphors help integrate topics into a memorable format and produce deeper comprehension.³ As such, analogies can aid in the visualization of these complex spatial concepts. The MMS tissue-processing technique has been compared to flattening a pie pan.⁴ More recently, a peanut butter cup analogy was described as a visualization tool for explaining the various steps of MMS to patients.⁵ Although these analogies may help elucidate certain aspects of the MMS technique, none adequately account for the multilayered anatomy of the skin.

The Technique

To address this need, we developed the cantaloupe analogy, which provides visual representation of the 3 basic skin layers: (1) the rind represents the epidermis; (2) the flesh represents the dermis, and (3) the seed cavity represents the subcutaneous layer (Figures 1 and 2).

In MMS tissue processing, the peripheral margin of the ovoid excised skin specimen is pressed down into the same plane as the deepest layer through a process called relaxation.⁴ The cantaloupe represents the dome shape of the relaxed tissue, which is then serially sectioned in horizontal layers from deep to superficial (Figure 2). The first slice represents the deepest subcutaneous layer and most peripheral dermal and epidermal layers of the specimen (Figure 3). Using the cantaloupe analogy,

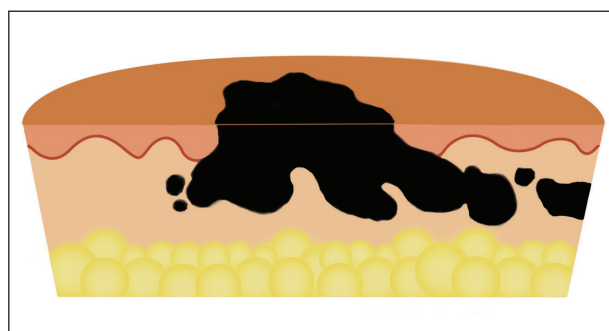


FIGURE 1. Cross-section of a typical Mohs micrographic surgery tissue specimen illustrating a skin cancer (black), as well as the epidermal, dermal, and subcutaneous layers. Image courtesy of Janna M. Vassantachart, MD.

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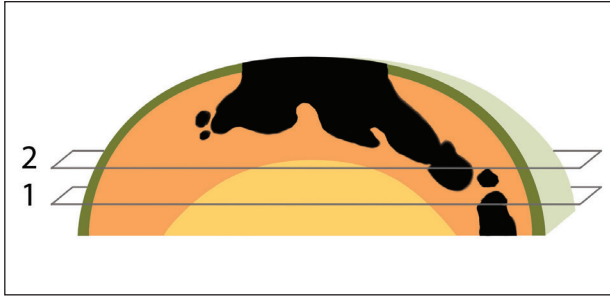


FIGURE 2. Cross-section of a cantaloupe slice illustrating a relaxed Mohs micrographic specimen with skin cancer and 3 analogous skin layers: rind (epidermis), flesh (dermis), and seed cavity (subcutaneous layer). The location of the first 2 histologic slices is demonstrated. Image courtesy of Janna M. Vassantachart, MD.

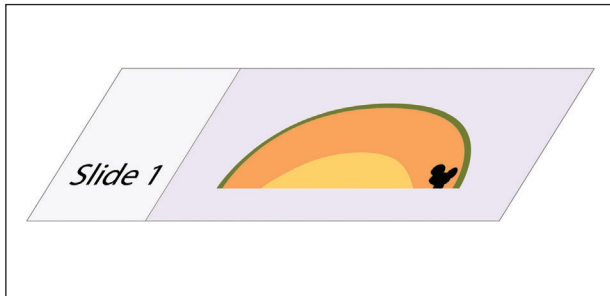


FIGURE 3. Illustration showing the first histologic slice of the cantaloupe for complete circumferential peripheral and deep margin assessment. Skin cancer is present in the flesh, which is analogous to the dermal layer. Image courtesy of Janna M. Vassantachart, MD.

subsequent stages (if warranted) would be guided by the location of the residual skin cancer. If the skin cancer is in the epidermis (rind) or dermis (flesh), then a skin specimen from the perimeter of the defect would be indicated. Residual skin cancer extending into the subcutaneous layer (seed cavity) would require a deeper resection.

Practice Implications

The cantaloupe provides a simple analogy to conceptualize the transition from the multilayered 3-dimensional skin tissue specimen to the 2-dimensional histologic slide specimen. Use of this cantaloupe analogy will aid dermatology residents and others interested in gaining a clearer understanding of MMS.

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