Mohs Surgery for Melanoma In Situ — Where We Stand

Given the limited data available, Mohs surgery is still not routinely performed for invasive melanoma of the skin.

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You were just diagnosed with stage 0 melanoma, or melanoma in situ, on the tip of your ear. You learn that you are 'lucky' and that your melanoma was detected before it had time to spread throughout your body. A surgery to remove the melanoma is quickly scheduled, and you take a deep breath and try not to think of what you narrowly avoided.

The most widely performed surgery to treat melanoma in situ is called a wide local excision where a surgeon removes the tumor with a margin of clear-looking skin of .5 — 1 cm. The wound is then stitched together. This technique has proven to be effective at curing melanoma in situ in most patients.

While effective and time tested, the procedure can cause significant scarring and even loss of function when performed in delicate areas. For non-melanoma skin cancers, such as basal cell carcinomas and squamous cell carcinomas, an alternative 'tissue-sparing' procedure is frequently performed called Mohs Micrographic Surgery. Mohs Micrographic Surgery, frequently shortened to just Mohs surgery, was developed in the 1930s by Frederic Mohs, MD, professor of surgery at the University of Wisconsin.

In Mohs surgery, cancer is removed one layer at a time in an outpatient setting. It is usually performed under local anesthesia. After each layer is removed, it is then carefully examined under a microscope. A technician determines whether or not all cancer cells have been removed from the tissue sample. This cycle of single-layer tissue removal and microscopic evaluation continues until cancer cells are no longer found.

While more time consuming, Mohs surgery is more precise and allows surgeons to confirm that all tumor is removed before stitching the wound. This preserves more tissue and leaves smaller scars. In some cases — and at some locations — the procedure is also being used to treat melanoma in situ.

MRA-funded investigator Maria Wei, MD, PhD, director of the University of California, San Francisco, Melanoma Surveillance Clinic, has seen thousands of melanoma patients through her years of clinical practice. She first considered Mohs surgery for melanoma in situ as she sat across

from a carpenter. He was seeing her because of a large pink lesion on the top of his foot. It has been biopsied by other dermatologists many times already, but nothing was ever found.

But for over a period of two years, the lesion was clearly getting bigger. Alarmingly bigger.

Wei pulled the records from the previous biopsies, and scrutinized every layer from each tissue sample. And there it was, one tiny piece of previously undetected melanoma in situ. She presented her findings to UCSF's multi-specialty Tumor Board, which reviews cases that are difficult to diagnose, treat, or manage. Here, Wei proposed treatment with Mohs Micrographic Surgery as opposed to the standard Wide Local Excision. "If we do wide local," she argued, "we would be taking off all his toes. This man is a carpenter, he needs mobility to work. If we do Mohs, we can save the toe, and hopefully his livelihood."

While standard of care for non-melanoma skin cancers, Mohs surgery is used less frequently for melanoma in situ because melanoma is far more aggressive (and likely to spread) than other types of skin cancer. When caught early, melanoma is relatively easy to treat and cure. However, once it has spread, melanoma can be deadly. Doctors fear missing microscopic melanoma cells that could end up spreading throughout the body.

In addition, while the edges of non-melanoma skin cancers are easy to see under a microscope, melanoma cells — especially atypical melanoma cells — are harder to detect. However, in recent years, researchers have refined the Mohs technique with the addition of special stains — called immunohistochemistry stains — that preferentially stick to the cells that develop melanoma. This helps make melanoma more prominent under a microscope.

After the carpenter was successfully treated, Wei began to think about Mohs surgery as a potentially viable treatment for more patients, but was shocked at the lack of data comparing the outcomes of patients treated with each approach.

With her team, Wei designed a retrospective study of 662 melanoma in situ patients treated with either Mohs or Wide Local Excision. Her study found no significant difference in the rate of recurrence, melanoma-specific survival, or overall survival between the two groups."For the first time we had some solid data that suggests that melanoma in situ can be treated with Mohs with the same or perhaps even better outcomes," said Wei.

Despite being a small retrospective analysis, the study's results are encouraging. If the findings are verified in a larger, randomized trial, patients who need complex surgery to remove melanoma in situ from sensitive areas—the head, face, hands, and neck—could have more treatment options.

Given the limited data available, Mohs surgery is still not routinely performed for invasive melanoma of the skin; however, it has been recognized over the past decade as an option for melanoma in situ, particularly the lentigo maligna type associated with chronic sun damage, in both the American Academy of Dermatology and National Comprehensive Cancer Network melanoma clinical practice guidelines.

However, because of the enhanced staining used for melanoma, even doctors who regularly perform Mohs surgery for non-melanoma skin cancers may not do so for melanoma in situ. “Mohs is a fabulous technique to get 100% margin control, while minimizing the site of defect,” explains MRA-funded investigator Maryam Asgari, MD, director of Massachusetts General Hospital’s High Risk Skin Cancer Clinic. However, “it requires a team of pathologists trained in diagnosing melanoma in frozen sections. Because of these limitations, adoption is low.”

Wei agreed with the need for additional staff, “with Mohs surgery, you need a whole other set of support staff. There’s a technical barrier of performing Mohs” for melanoma in situ.

Time — and further study — is needed in this area to know definitively if Mohs surgery provides as good (or better) results than the standard of care. Speak to your surgeon about your concerns.

At all stages, melanoma is a costly, unforgiving disease. Mohs surgery may provide an alternative to Wide Local Excision, giving patients and doctors alike another tool to treat skin cancer. “As physicians, we would like a lot of tools in in our tool belt. We don’t want to use a hammer for everything,” says Wei.

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