

BRIEF ARTICLES

Mohs Micrographic Surgery Peripheral Margin Control Prior to En Bloc Tumor Resection: A Report of Three Cases

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ABSTRACT

Background. Mohs micrographic surgery (MMS) is an important part of non-melanoma skin cancer (NMSC) management but may even be useful for tumors that cannot be cleared in an office setting. There are sparse reports of MMS for peripheral margin control in the dermatology literature but various techniques have been reported.

Case 1. 58-year-old male with morpheaform basal cell carcinoma of the left midface treated with MMS peripheral margin control followed by facial plastic surgery central tumor extirpation and defect repair.

Case 2. 56-year-old female with recurrent morpheaform BCC of the scalp treated with MMS peripheral margin control followed by facial plastic surgery central tumor extirpation and defect repair.

Case 3: 73-year-old male with multiply recurrent SCC of the right lower extremity treated with MMS peripheral margin control followed by central tumor extirpation and reconstruction.

Conclusions: MMS peripheral margin control followed by central tumor extirpation and defect reconstruction at a later date in the operating room is an option for deeply invasive, large and aggressive NMSC. Benefits include decreased time under general anesthesia and superior rates of tumor clearance. In the interim, the peripheral defect between the central tumor and healthy outer tissue can be sutured closed to decrease patient morbidity.

CASE #1

An otherwise healthy, 58-year-old male presented with a long standing morpheaform basal cell carcinoma of the left midface, involving lip, nose and cheek (Figure 1). Pathology was remarkable for a

deeply infiltrating tumor including perineural and maxillary bone invasion. Multidisciplinary care was coordinated with facial plastic surgery. Two stages of Mohs micrographic surgery (MMS) were needed

for peripheral margin control, followed by central tumor extirpation and defect reconstruction in the operating room by facial plastic surgery.



Figure 1. Morpheiform BCC of left midface, preoperative (A) and post-MMS peripheral margin control (B).

CASE #2

A 56-year-old female with multiple comorbidities including ulcerative colitis, myotonic dystrophy and hypothyroidism presented with a recurrent morpheiform BCC of the scalp. The site had been previously repaired with a skin graft, resulting in an area of focal alopecia (Figure 2). Pathology was notable for a deeply infiltrating tumor including perineural and deep fascial invasion. Multidisciplinary

care was coordinated with facial plastic surgery. Three stages of MMS were needed for peripheral margin control, followed by central tumor extirpation and defect reconstruction in the operating room by facial plastic surgery.

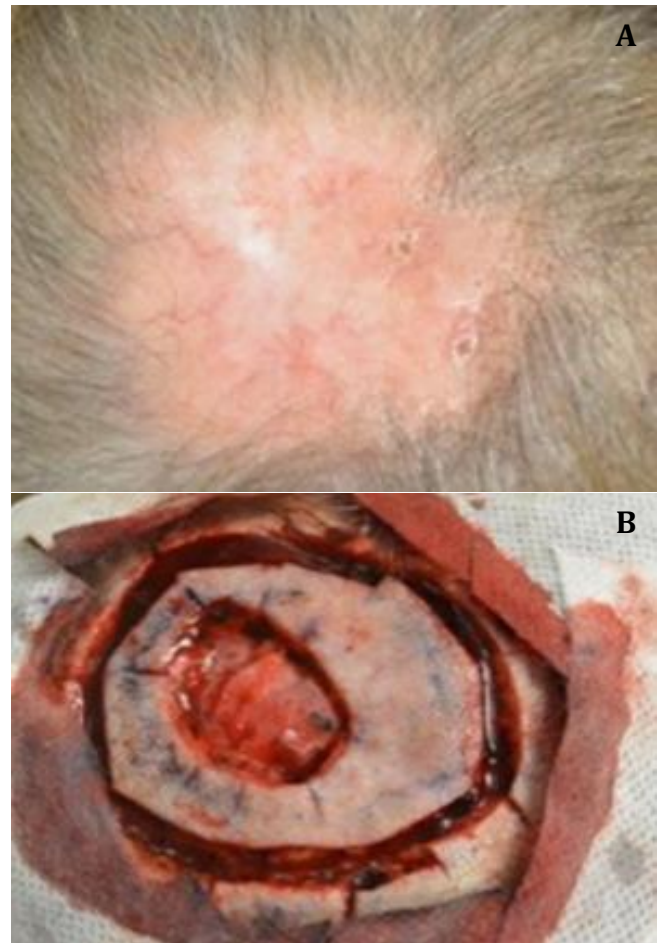


Figure 2. Recurrent morpheiform BCC of the scalp, preoperative (A) and post-MMS peripheral margin control (B).

CASE #3

A 73-year-old male with a history of severe psoriasis and numerous cutaneous SCC's presented with a very large, ulcerated, multiply recurrent SCC of the right lower extremity (Figure 3). Pathology was notable for a deeply infiltrating tumor with perineural and deep fascial invasion. Multidisciplinary

care was coordinated with plastic surgery and surgical oncology. Two stages of MMS were needed for peripheral margin control.

The patient was then sent for definitive central tumor extirpation and leg reconstruction.



Figure 3. Recurrent aggressive SCC of the right lower extremity, preoperative tumor (A) and post-MMS peripheral margin control (B).

DISCUSSION

MMS has an established reputation as the treatment of choice for high-risk non-melanoma skin cancers (NMSC). The goal is usually to clear the patient completely with MMS and patients that cannot reasonably be cleared in the office are unlikely to be scheduled for MMS. However, there are techniques that have emerged for dealing with tumors that are presumably too complicated to clear in the office under local anesthesia alone. Staged excisions in the office do not benefit from complete margin control and often leave

patients with open wounds for prolonged periods of time when performed in the office. If performed in the operating room, intraoperative frozen sections tend to be even less accurate than standard permanent sections.¹ The “perimeter technique” and the “square technique” (modified staged excisions employed for lentigo maligna) involve removing the perimeter around a tumor in a geometric configuration that is then processed as vertical permanent sections.^{2,3} The perimeter gap can then be sutured between stages for less patient

morbidity. The “spaghetti technique” is very similar to the perimeter technique but the perimeter is determined clinically and the tissue is processed as comprehensive, longitudinal *en face* permanent sections.⁴ These techniques all involve permanent sections, which can avoid melanocyte distortion often seen with frozen sections and may inhibit MMS (although, special immunohistochemical stains can be used to identify melanocytes on frozen sections, re-enabling melanocyte identification). For complicated NMSC, the two issues of peripheral margin control and deep margin control remain. Both can be addressed with intraoperative complete MMS but this requires significant coordination of care and allocation of surgical assets that is unlikely to translate to widespread use.⁵ Furthermore, intraoperative MMS can prolong the time a patient is under anesthesia with the corresponding increased risks of significant morbidity and mortality. Alternatively, peripheral margins can be cleared in an office setting using MMS via the “Mohs moat technique” or “ring of Mohs technique.”^{6,7} These techniques modify the “spaghetti technique” by using MMS to clear the peripheral margin. Once clear, the patient can then be sent for central tumor extirpation and defect repair in the operating room.^{6,7} This technique has been employed for different types of NMSC but the literature is sparse on using this technique for high-risk squamous cell carcinoma (SCC) or morpheaform basal cell carcinoma (BCC), none of which, to our knowledge, have been previously reported in the dermatology literature.⁶⁻⁸

CONCLUSION

Our three cases of complex NMSC provide further data supporting the use of MMS for peripheral margin control even if the patient will require central tumor extirpation and defect reconstruction at a later date in the operating room. Peripheral margin control can be achieved in the office under local anesthesia and reduce the time the patient is in the operating room under general anesthesia, in addition to providing superior rates of tumor clearance via comprehensive, longitudinal *en face* sectioning. In the interim between the two procedures, the peripheral defect between the central tumor and healthy outer tissue can be sutured closed to decrease patient morbidity.

Conflict of Interest Disclosures: none.

Funding: none.

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