

# Modified Mohs Micrographic Surgery: Indonesian NCC experience

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## Introduction

Mohs micrographic surgery (MMS) is a specialized form of skin cancer surgery with the highest cure rates for several skin cancer.<sup>1</sup>

MMS is defined as visible resection of the tumor and minimizes tissue removal, sparing normal tissue. Excision is followed by a complete histopathological analysis of the peripheral and deep surgical margins.<sup>1,2</sup>

Approximately 75% of skin cancer are basal cell carcinoma (BCC), whereas cutaneous squamous cell carcinoma (SCC) represent approximately 20%, and the remaining are melanomas (4%) and other rare tumors.<sup>1</sup>

MMS is the standard of care for BCC and SCC with a high risk of recurrence or in sensitive anatomic sites or where clinical boundaries are difficult to define. It is routinely indicated and increasingly used for the treatment of other skin malignancies such as melanomas.<sup>1,3</sup>

The inherent advantages of complete microscopic surgical margin analysis and precise tumor mapping enable the highest possible cure rate while maximizing tissue preservation and optimizing cosmetic and functional outcomes.<sup>3</sup>

Complete excision of the lesion is achieved with the maximum amount of normal tissue preserved with a complete histopathological analysis. 16 skin cancers treated with mMMS in Indonesian NCC in the last 2 years, with the procedure used. Complete excision of the tumors was achieved with one to two levels, with margins of excision ranging from 2 to 5 mm. There were no local recurrences at the median follow-up of 9.5 months.

## Methods

Prior to treatment, a positive histological diagnosis was made in all patients.

The first step is to identify and mark the border of the lesion visible by dermoscopy. Followed by, marking second outline 2 mm to 5 mm from the previously marked peripheral tumor margin.

Then, the tumor is removed (debulking), followed by removal of the second marker. The depth of excision are into the deep subcutaneous fat. The skin defect temporarily closed while waiting histological evaluation of the margins by pathologist.

If frozen section analysis of the initial margins reveals residual tumor (positive margins), then process is repeated. Histologically positive excision margins allow for tumor mapping by gradually expanding the excision margins.

A second layer of normal-appearing tissue with a margin of 3 mm laterally was taken only around the positive area, thus no excision of normal tissue was carried out. If only the deep margin is involved, the second stage can be taken in that area without enlarging the diameter of the defect. The specimen is again oriented with color coded margins and sent to the pathologist.

The whole process was repeated until a histologically free tumor margin was obtained. Reconstruction is then carried out with skin flaps or grafts after confirmation of clean surgical margins, if necessary closure is performed by Plastic Surgery. The follow-up period was determined by the duration from excision to last examination.

#### Data collection

Each patient's medical record was reviewed including clinical notes, surgical reports, and pathology. Data collected including age, sex, occupation, MMS date, skin cancer type, skin cancer anatomical location, excision margin at each level, number of stages of MMS required for complete excision, and recurrence-free interval were evaluated. An interesting result is local recurrence. Biopsy is indicated if clinical recurrence is suspected.

#### Results

From January 1, 2021 to December 31, 2022, a total of 16 skin cancers were treated with mMMS. The mean patient age at surgery was 68.7 years (range 21–69 years). Twelve patients were female, and four were male. It consists of 13 KSB (81.3%), 2 MM (12.5%), and 1 KSS (6.3%). The patient had undergone a biopsy prior to the Mohs procedure.

Twelve cases were located on the face, two cases on the extremities, and two cases on the trunk.

Patients are treated with one to two stages of micrographic surgery to achieve histological tumor-free margins. After the first stage of surgery, including an initial lateral excision margin of 2 to 5 mm, 14 of 16 tumors were completely excised. Two tumors required a second excision. The mean number of stages required for margin clearance was  $1.13 \pm 0.34$ . Patients were monitored for relapse at a median interval of 9.5 months (range 5-19 months).

Of the 16 skin cancers treated with mMMS, 1 suspected local recurrence occurred four months after surgery. After PA examination, no cancer cells were found in the lesions suspected of recurrence.

## **Discussion**

In the 1960s, Dr. Theodore Mohs first published an article using the fresh tissue technique on tumors located on other parts of the body.<sup>4</sup> The modifications by dr. Tromovitch of Dr. Mohs's technique enabled the procedure to be done in a single day.<sup>5</sup>

The fresh-frozen tissue technique quickly became the standard of care, and in 1987, the American College of Chemosurgery was renamed as the American College of Mohs Surgery and Cutaneous Oncology to reflect this practice.<sup>6</sup>

MMS is a specialized surgical excision technique ideally used for the treatment of various skin neoplasms that grow closely together and are located in cosmetically sensitive areas or areas with a high risk of recurrence. It offers excellent cure rates for this type of tumor, by offering complete and prompt assessment of all periphery and deep margins of skin cancer, while preserving the maximum amount of healthy tissue.<sup>7</sup>

Therefore, with MMS, complete excision of the lesion is achieved with the maximum amount of normal tissue preserved, this where determination of tumor margin with dermoscopy can help precise surgical margin, because the surgical margins are adjusted according to what is found histologically.<sup>7</sup>

Regardless of the surgical technique, proper evaluation of the surgical margins is of the utmost importance. Tissue management and pathological evaluation vary widely in literature and practice.<sup>8</sup>

Despite the lack of consensus regarding the exclusive use of frozen sections, almost all authors agree that the accuracy of the evaluation of the margins is highly dependent on the experience of the surgeon, the histology technician, the tissue processing procedure, and, when relevant like ours, the pathologist.<sup>8</sup>

Our technique represents modified MMS with immediate processing and same day closure, except in cases requiring reconstruction from Plastic Surgery. Although our results are limited by small sample size, further studies in larger patient are needed to further investigate the utility of this surgical modification of MMS.

## **Conclusion**

Modified Mohs micrographic surgery is an effective skin cancer treatment as evidenced by low local recurrence rates and high skin cancer specific survival. And multidisciplinary approach between different specialty in treating skin cancer are also can be beneficial in MMS when needed.

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