Melanoma Recurrence after Mohs Micrographic Surgery with MART-1: A Systematic Review and Meta-analysis

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Background

- Cutaneous melanoma (CM) affects about 287,000 new people per year. Additional worse prognoses are associated with CM located on the head, neck, and trunk compared to extremities. Surgical management continues to be the primary therapeutic approach for CM.
- Current guidelines recommend wide local excision of CM but Mohs micrographic surgery should be considered for special sites and when there is suspicion of subclinical spread.
- MMS is ideal for the head and neck due to the high recurrence rates of CM due to particular risk factors. Unfortunately, hematoxylin & eosin frozen sections were notoriously difficult to interpret for CM resulting in poor sensitivity and specificity.

Objective

We aim to determine the rate of local recurrence of cutaneous melanoma after utilization of Mohs micrographic surgery (MMS) with melanocyte-associated antigen recognized by T-cells (MART-1) immunohistochemistry (IHS) in frozen sections.

Methods

The authors followed the guidelines of the Cochrane Handbook for Systematic Reviews of Interventions to execute the study. The authors followed the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-analyses) statement and checklist.

Search: PubMed, Medline, and Cochrane databases

- “MMS” AND “Melanoma”
- “MART-1” AND “Melanoma”

Inclusion:

- Utilization of MART-1 immunohistochemistry in frozen sections
- Melanoma in situ or invasive melanomas
- Prospective, retrospective, randomized controlled trials
- Published in a peer-reviewed journal
- Published in English

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Results

- N
- Age (mean, range)
- Sex
- Female
- Male
- Lesion Type
- Primary
- Invasive
- Melanoma in-situ
- Location
- “Other”
- Head/Neck
- Face
- Neck
- Scalp
- Ears
- F/U time, Mean(range)
- Total Recurrence
- Total Local Recurrence
- Risk of Bias

Discussion

- MMS with MART-1 continues to demonstrate lower recurrence rates than conventional excision. Furthermore, the utilization of MART-1 in MMS for CM demonstrated advantages over classical MMS in recurrence and surgeon preference.
- Since 2001, the chances of receiving MMS for melanoma has increased 304% in 2016. Only 26.8% of the cases reported use of Immunohistochemistry stains (IHC) - demonstrating a significant increase in utilization over the time period.
- In addition to ease of use/interpretability and outcome improvement, it is important to investigate financial feasibility. Wilson et al. demonstrated that among comprehensive margin assessment techniques for MIS/IM, staged excision using en-face margin assessment (SEEM) and MMS with MART-1 were similar in cost to the healthcare system. The authors noted that SEEM incurred lower costs due to decreased excision code reimbursement and lower number of stages while MMS with MART-1 required less complex reconstruction and the multiple procedure reduction rule. MMS “classic” with H&E generally required more stages, larger margins, and a flap or graft.
- The data presented in this study demonstrates that the increasing utilization of MART-1 in MMS for cutaneous melanoma is warranted and should be recommended, where applicable. The evidence supports current AUC and NCCN recommendations while demonstrating further evidence to expand the use of MMS with MART-1 for CM where local excision continues to demonstrate worse recurrence rates.

Conclusion

This review demonstrates that MMS with MART-1 IHC in frozen sections has proven to be a technique that produces satisfactory recurrence rates for melanoma in-situ and invasive melanoma. The risk-of-bias of the included studies has been determined to be “moderate” and primarily observational. There appears to be discordance between current guidelines and research supporting broader use of MMS with MART-1.

References

5. et al. The “Rule of 10s” versus Risk of Bias Assessment (SEEM) and MMS with MART-1 were similar in cost to the healthcare system. The authors noted that SEEM incurred lower costs due to decreased excision code reimbursement and lower number of stages while MMS with MART-1 required less complex reconstruction and the multiple procedure reduction rule. MMS “classic” with H&E generally required more stages, larger margins, and a flap or graft. The data presented in this study demonstrates that the increasing utilization of MART-1 in MMS for cutaneous melanoma is warranted and should be recommended, where applicable. The evidence supports current AUC and NCCN recommendations while demonstrating further evidence to expand the use of MMS with MART-1 for CM where local excision continues to demonstrate worse recurrence rates.

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