

Suture Selection to Minimize Postoperative Postinflammatory Hyperpigmentation in Patients With Skin of Color During Mohs Micrographic Surgery

Carolina Gonzalez Bravo, BS; Nicole A. Negbenebor, MD

The effects of suture selection on postinflammatory hyperpigmentation (PIH) in patients with skin of color who have had Mohs micrographic surgery (MMS) are limited. During the COVID-19 pandemic, fast-absorbing gut sutures reduced the need for in-person follow-up visits without increasing the frequency of postoperative complications. Although absorbable gut sutures are popular, they are highly reactive and can induce inflammation in patients with skin of color. Choosing less inflammatory, nonabsorbable sutures can improve the cosmetic outcome for patients with skin of color who undergo MMS. *Cutis*. 2023;112:227-228.

Practice Gap

Proper suture selection is imperative for appropriate wound healing to minimize the risk for infection and inflammation and to reduce scarring. In Mohs micrographic surgery (MMS), suture selection should be given high consideration in patients with skin of color.¹ Using the right type of suture and wound closure technique can lead to favorable aesthetic outcomes by preventing postoperative postinflammatory hyperpigmentation (PIH) and keloids. Data on the choice of suture material in patients with skin of color are limited.

Suture selection depends on a variety of factors including but not limited to the location of the wound on the body, risk for infection, cost, availability, and the personal preference and experience of the MMS surgeon. During the COVID-19 pandemic, suture

preference among dermatologic surgeons shifted to fast-absorbing gut sutures,² offering alternatives to synthetic monofilament polypropylene and nylon sutures. Absorbable sutures reduced the need for in-person follow-up visits without increasing the incidence of postoperative complications.

Despite these benefits, research suggests that natural absorbable gut sutures induce cutaneous inflammation and should be avoided in patients with skin of color.^{1,3,4} Nonabsorbable sutures are less reactive, reducing PIH after MMS in patients with skin of color.

Tools and Technique

Use of nonabsorbable stitches is a practical solution to reduce the risk for inflammation in patients with skin of color. Increased inflammation can lead to PIH and increase the risk for keloids in this patient population. Some patients will experience PIH after a surgical procedure regardless of the sutures used to repair the closure; however, one of our goals with patients with skin of color undergoing MMS is to reduce the inflammatory risk that could lead to PIH to ensure optimal aesthetic outcomes.

A middle-aged African woman with darker skin and a history of developing PIH after trauma to the skin presented to our clinic for MMS of a dermatofibrosarcoma protuberans on the upper abdomen. We used a simple running suture with 4-0 nylon to close the surgical

Carolina Gonzalez Bravo is from the Roy J. and Lucille A. Carver College of Medicine, University of Iowa, Iowa City. Dr. Negbenebor is from the Department of Dermatology, University of Iowa Hospitals & Clinics, Iowa City.

Carolina Gonzalez Bravo reports no conflict of interest. Dr. Negbenebor has served as a speaker for Nema Beauty Cosmetics.

Correspondence: Nicole A. Negbenebor, MD, 200 Hawkins Dr, Iowa City, IA 52242 (nicole-negbenebor@uiowa.edu).

doi:10.12788/cutis.0884

wound. We avoided fast-absorbing gut sutures because they have high tissue reactivity^{1,4}; use of sutures with low tissue reactivity, such as nylon and polypropylene, decreases the risk for inflammation without compromising alignment of wound edges and overall cosmesis of the repair. Prolene also is cost-effective and presents a decreased risk for wound dehiscence.⁵ After cauterizing the wound, we placed multiple synthetic absorbable sutures first to close the wound. We then did a double-running suture of nonabsorbable monofilament suture to reapproximate the epidermal edges with minimal tension. We placed 2 sets of running stitches to minimize the risk for dehiscence along the scar.

The patient was required to return for removal of the nonabsorbable sutures; this postoperative visit was covered by health insurance at no additional cost to the patient. In comparison, long-term repeat visits to treat PIH with a laser or chemical peel would have been more costly. Given that treatment of PIH is considered cosmetic, laser treatment would have been priced at several hundred dollars per session at our institution, and the patient would likely have had a copay for a pretreatment lightening cream such as hydroquinone. Our patient had a favorable cosmetic outcome and reported no or minimal evidence of PIH months after the procedure.

Patients should be instructed to apply petrolatum twice daily, use sun-protective clothing, and cover sutures to minimize exposure to the sun and prevent crusting of the wound. Postinflammatory hyperpigmentation can be proactively treated postoperatively with topical hydroquinone, which was not needed in our patient.

Practice Implications

Although some studies suggest that there are no cosmetic differences between absorbable and nonabsorbable sutures, the effect of suture type in patients with skin of color undergoing MMS often is unreported or is not studied.^{6,7} The high reactivity and cutaneous inflammation associated with absorbable gut sutures are important considerations in this patient population.

In patients with skin of color undergoing MMS, we use nonabsorbable epidermal sutures such as nylon and Prolene because of their low reactivity and association with favorable aesthetic outcomes. Nonabsorbable sutures can be safely used in patients of all ages who are undergoing MMS under local anesthesia.

An exception would be the use of the absorbable suture Monocryl (J&J MedTech) in patients with skin of color who need a running subcuticular wound closure because it has low tissue reactivity and maintains high tensile strength. Monocryl has been shown to create less-reactive scars, which decreases the risk for keloids.^{8,9}

More clinical studies are needed to assess the increased susceptibility to PIH in patients with skin of color when using absorbable gut sutures.

REFERENCES

1. Williams R, Ciocon D. Mohs micrographic surgery in skin of color. *J Drugs Dermatol*. 2022;21:536-541. doi:10.36849/JDD.6469
2. Gallop J, Andrasik W, Lucas J. Successful use of percutaneous dissolvable sutures during COVID-19 pandemic: a retrospective review. *J Cutan Med Surg*. 2023;27:34-38. doi:10.1177/12034754221143083
3. Byrne M, Aly A. The surgical suture. *Aesthet Surg J*. 2019;39(suppl 2):S67-S72. doi:10.1093/asj/sjz036
4. Koppa M, House R, Tobin V, et al. Suture material choice can increase risk of hypersensitivity in hand trauma patients. *Eur J Plast Surg*. 2023;46:239-243. doi:10.1007/s00238-022-01986-7
5. Pandey S, Singh M, Singh K, et al. A prospective randomized study comparing non-absorbable polypropylene (Prolene®) and delayed absorbable polyglactin 910 (Vicryl®) suture material in mass closure of vertical laparotomy wounds. *Indian J Surg*. 2013;75:306-310. doi:10.1007/s12262-012-0492-x
6. Parell GJ, Becker GD. Comparison of absorbable with nonabsorbable sutures in closure of facial skin wounds. *Arch Facial Plast Surg*. 2003;5:488-490. doi:10.1001/archfaci.5.6.488
7. Kim J, Singh Maan H, Cool AJ, et al. Fast absorbing gut suture versus cyanoacrylate tissue adhesive in the epidermal closure of linear repairs following Mohs micrographic surgery. *J Clin Aesthet Dermatol*. 2015;8:24-29.
8. Niessen FB, Spauwen PH, Kon M. The role of suture material in hypertrophic scar formation: Monocryl vs. Vicryl-Rapide. *Ann Plast Surg*. 1997;39:254-260. doi:10.1097/0000637-199709000-00006
9. Fosko SW, Heap D. Surgical pearl: an economical means of skin closure with absorbable suture. *J Am Acad Dermatol*. 1998;39(2 pt 1):248-250. doi:10.1016/s0190-9622(98)70084-2