

Delayed-onset *Pseudomonas* infection manifesting as pain



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Key words: chondritis; delayed infection; Mohs micrographic surgery; *Pseudomonas*.

INTRODUCTION

The overall infection rate after Mohs micrographic surgery (MMS) is low, with 1 study estimating it to be 3.2% for sutured wounds and 6.8% for second intention wounds.¹ Risk factors for infection after MMS include malnutrition, older age, diabetes, immunosuppression, and extensive inflammatory skin disease.² Surgical sites on the ears, lower extremities, and lips are considered high-risk sites for postoperative surgical site infections.² In a study of positive culture findings following MMS, infections were most commonly caused by *Staphylococcus aureus* (45.4%) and *Pseudomonas aeruginosa* (10.8%), along with other gram-positive and gram-negative species.³ To our knowledge, no cases of delayed infections of the ear have been reported following MMS. Herein, we present 2 such cases of delayed (>30 days) *P aeruginosa* infections after MMS on the ear.

CASE REPORTS

Case 1

An 89-year-old man underwent MMS for a primary nodular basal cell carcinoma on the lower portion of his left antihelix. Two stages were required to obtain clear margins, and the defect was repaired by partial intermediate closure. The area, measuring 2 × 2.4 cm, was allowed to heal by secondary intention (Fig 1). The patient returned to the clinic 2 months later. His ear was painful on touch and was bleeding. There was a tense bulla at the root of the helical crus (Fig 2). The culture of a swab specimen showed *P aeruginosa*, and he was prescribed ciprofloxacin. Two weeks later, he reported no more pain

Abbreviation used:

MMS: Mohs micrographic surgery

or bleeding at the site. He did not have a history of diabetes, immunosuppression, or smoking.

Case 2

An 81-year-old man underwent MMS for a primary squamous cell carcinoma of the posterior aspect of the superior portion of the helix. He had a history of renal insufficiency but no history of immunosuppression, diabetes, or smoking. Clear margins were obtained after 2 stages. The final wound dimensions were 2.5 × 1.4 cm (Fig 3). The wound was allowed to heal by secondary intention.

The patient came to the clinic 2 weeks later to have his wound checked. At that time, the wound was fully granulated, and he did not have any symptoms of infection. However, 2 weeks later (1 month after MMS), he returned to the clinic with new-onset pain with tenderness, drainage, and a new anterior papule (Fig 4). A swab specimen and biopsy were obtained for evaluation. The swab finding was positive for *P aeruginosa*, and pathologic findings showed an ulcer with granulation tissue and gram-negative bacilli. The patient was given ciprofloxacin, and the wound healed appropriately.

DISCUSSION

These 2 cases demonstrate that new-onset pain and drainage even months after MMS can signify a *P aeruginosa* infection. Both cases occurred on the ear,

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Funding sources: None.

IRB approval status: Not applicable.

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JAAD Case Reports 2021;15:123-5.
2352-5126

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<https://doi.org/10.1016/j.jidcr.2021.07.024>

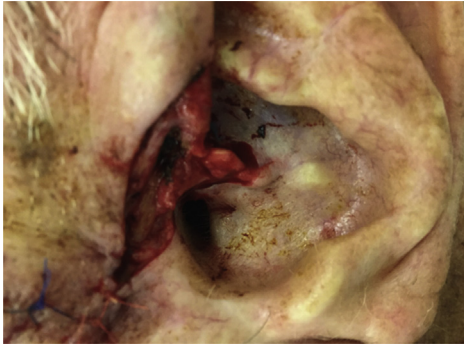


Fig 1. Postoperative closure showing the area of secondary intention healing (case 1).



Fig 2. New bullae 2 months after Mohs micrographic surgery (case 1).

and it is known that the ear is a high-risk site for postoperative infection.² Rates of postoperative chondritis after MMS have been reported at 5.6%, with most symptoms noted during the first postoperative week.⁴ *P aeruginosa* colonization of the surgical site can increase the risk of postoperative chondritis,⁵ and the risk increases when MMS extends to the cartilage.⁴ However, rates of postoperative infection of the ear are still low, even when perichondrium is exposed during secondary intention healing.⁶

Mailler-Savage et al⁷ described the use of fluoroquinolones as an adjunct to MMS on the ear, with the most widely accepted belief that antibiotic prophylaxis is not necessary to prevent postoperative infections. When postoperative *P aeruginosa* infections do occur, treatment is imperative to prevent malignant otitis externa.⁸



Fig 3. Postoperative defect (case 2).



Fig 4. New-onset bleeding and anterior papule at the site of Mohs micrographic surgery (case 2).

Delayed infection at a site of MMS is rare; however, infection with *Mycobacterium abscessus* has been reported.⁹ To our knowledge, delayed-onset *Pseudomonas* infections have not been reported in the dermatology literature, although they have been reported after ophthalmologic surgery.¹⁰ In both of our cases, the delayed infections occurred in older patients after secondary intention healing. Therefore, it may be prudent to discuss the possibility of delayed infections, even weeks after surgery, with patients who have secondary intention healing after MMS on the ear. In conclusion, *Pseudomonas* infection should be

considered when patients have new-onset pain after MMS on the ear.

Conflicts of interest

None disclosed.

REFERENCES

1. Schimmel J, Belcher M, Vieira C, Lawrence N, Decker A. Incidence of surgical site infections in second intention healing after dermatologic surgery. *Dermatol Surg.* 2020;46(12):1492-1497. <https://doi.org/10.1097/DSS.0000000000002409>
2. Wright TI, Baddour LM, Berbari EF, et al. Antibiotic prophylaxis in dermatologic surgery: advisory statement 2008. *J Am Acad Dermatol.* 2008;59(3):464-473. <https://doi.org/10.1016/j.jaad.2008.04.031>
3. Dietert JB, Ko J, Hurst EA. Positive bacterial culture results at a dermatologic surgery center: a single-site retrospective review. *Dermatol Surg.* 2020;46(6):773-779. <https://doi.org/10.1097/DSS.0000000000002166>
4. Kaplan AL, Cook JL. The incidences of chondritis and perichondritis associated with the surgical manipulation of auricular cartilage. *Dermatol Surg.* 2004;30(1):58-62 [discussion: 62]. <https://doi.org/10.1111/j.1524-4725.2004.30005.x>
5. Salasche SJ. Acute surgical complications: cause, prevention, and treatment. *J Am Acad Dermatol.* 1986;15(6):1163-1185. [https://doi.org/10.1016/S0190-9622\(86\)70288-0](https://doi.org/10.1016/S0190-9622(86)70288-0)
6. Levin BC, Adams LA, Becker GD. Healing by secondary intention of auricular defects after Mohs surgery. *Arch Otolaryngol Head Neck Surg.* 1996;122(1):59-66 [discussion: 67]. <https://doi.org/10.1001/archotol.1996.01890130051008>
7. Mailler-Savage EA, Neal KW Jr, Godsey T, Adams BB, Gloster HM Jr. Is levofloxacin necessary to prevent post-operative infections of auricular second-intention wounds? *Dermatol Surg.* 2008;34(1):26-30 [discussion: 30-21]. <https://doi.org/10.1097/00042728-200801000-00005>
8. Wu DC, Chan WW, Metelitsa AI, Fiorillo L, Lin AN. Pseudomonas skin infection: clinical features, epidemiology, and management. *Am J Clin Dermatol.* 2011;12(3):157-169. <https://doi.org/10.2165/11539770-000000000-00000>
9. Fisher EJ, Gloster HM Jr. Infection with mycobacterium abscessus after Mohs micrographic surgery in an immunocompetent patient. *Dermatol Surg.* 2005;31(7 Pt 1):790-794. <https://doi.org/10.1097/00042728-200507000-00014>
10. Procope JA. Delayed-onset *Pseudomonas* keratitis after radial keratotomy. *J Cataract Refract Surg.* 1997;23(8):1271-1272. [https://doi.org/10.1016/S0886-3350\(97\)80327-6](https://doi.org/10.1016/S0886-3350(97)80327-6)