

# Chronic Kidney Disease and Postoperative Complications Following Mohs Surgery: A Retrospective Cohort Study

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## To the Editor,

Chronic kidney disease (CKD) affects approximately 14% of adults nationally and is characterized by impaired immunity, systemic inflammation, and microvascular dysfunction.<sup>1,2</sup> These physiologic disruptions impair wound healing and predispose patients to adverse surgical outcomes.<sup>1,2</sup> Mohs micrographic surgery (MMS) is the gold standard for managing nonmelanoma skin cancer (NMSC), offering high cure rates while preserving healthy tissue.<sup>3</sup> Given that MMS is frequently performed in medically complex patients,<sup>3</sup> including those with CKD, understanding the postoperative risks in this population is critical. While CKD has been broadly linked to poor surgical outcomes,<sup>2</sup> limited data exist on its impact on complication rates following MMS.

A retrospective cohort study was conducted using the TriNetX Research Network to evaluate the risk of postoperative complications in patients with CKD undergoing MMS for

NMSC. Adults diagnosed with basal cell carcinoma (BCC) or squamous cell carcinoma (SCC) who underwent MMS between July 21, 2020, and July 21, 2025, were identified. Patients with CKD were identified using the International Classification of Diseases, 10th revision code (ICD-10-CM) for CKD (N18). Patients with inherited or acquired disorders that impair wound healing, systemic infection, or sepsis on the day of surgery, or documentation of previous postoperative complications were excluded. A comparator cohort of patients without CKD was generated using 1:1 propensity score matching on age, sex, race, ethnicity, immunosuppressant medication use, and relevant comorbidities, including obesity, smoking, diabetes mellitus, chronic venous insufficiency, and peripheral arterial disease. The final matched cohorts included 25,016 patients each. Postoperative outcomes were assessed at 30-days and 90-days after surgery with risk ratios (RR). Statistical significance was defined as a two-sided *P*-value <0.05.

**TABLE 1.**

**Risk of Postoperative Complications 30 Days and 90 Days Following Mohs Micrographic Surgery for Nonmelanoma Skin Cancer in Patients Diagnosed With Chronic Kidney Disease (CKD)**

Outcomes	CKD Cohort	No CKD Cohort	Risk Ratio (95% Confidence Interval)	<i>P</i> -value	CKD Cohort	No CKD Cohort	Risk Ratio (95% Confidence Interval)	<i>P</i> -value
	Number of eligible individuals (number of outcomes, 30 days)	Number of eligible individuals (number of outcomes, 30 days)			Number of eligible individuals (number of outcomes, 90 days)	Number of eligible individuals (number of outcomes, 90 days)		
Postoperative Infection	24048 (127)	24405 (100)	1.29 (1.01-1.67)	0.047	24048 (162)	24405 (125)	1.32 (1.04-1.66)	0.021
Delayed wound healing	24328 (59)	24594 (44)	1.36 (0.92-2.00)	0.11	24328 (134)	24594 (94)	1.44 (1.11-1.88)	0.0062
Dehiscence	24540 (58)	24704 (36)	1.61 (1.07-2.46)	0.019	24540 (132)	24704 (95)	1.4 (1.08-1.82)	0.012
Graft complications	24931 (14)	24964 (≤10)	1.5 (0.67-3.60)	0.32	24931 (37)	24964 (17)	2.18 (1.23-3.87)	0.0077

By 30 days postoperatively, patients with CKD experienced significantly higher rates of surgical site infections (RR 1.29,  $P=0.047$ ) and wound dehiscence (RR 1.61,  $P=0.019$ ; Table 1). By 90 days, additional complications emerged: the risks of delayed wound healing (RR 1.44,  $P=0.0062$ ) and graft complications (RR 2.18,  $P=0.0077$ ), observed only among patients whose wounds were repaired with grafts, were now significantly increased. Further, significantly elevated risks of postoperative infection (RR 1.32,  $P=0.021$ ) and dehiscence (RR 1.40,  $P=0.012$ ) persisted. These findings suggest CKD is an independent risk factor for adverse outcomes following MMS. Complications appear to follow a biphasic pattern: acute complications such as infection and dehiscence are more prevalent early, while delayed wound healing complications emerge later. These trends may reflect the progressive tissue repair impairment seen in CKD, where uremia, vascular dysfunction, and chronic inflammation impair healing.<sup>4</sup> Dermatologic surgeons are encouraged to recognize CKD as a contributor to impaired healing following MMS, counsel patients accordingly during preoperative assessments, and anticipate and readily manage complications. Limitations include reliance on ICD-10-CM coding, retrospective design, and lack of clinical information on perioperative antibiotic use, defect size, or repair type. Future studies should incorporate prospective clinical data to definitively evaluate causality and guide targeted perioperative management.

## DISCLOSURES

Dr Tolkachjov is a speaker/investigator for CASTLE Biosciences, Bioventus, Kerecis, Leo Pharma, StimLabs, Regeneron, and Boehringer Ingelheim. All authors have no relevant conflicts of interest to disclose.

**Ethics Approval/Ethical Statement:** Data accessible via TriNetX is presented in aggregate form and only contains anonymized data as per the deidentification standard defined by the US Health Insurance Portability and Accountability Act (HIPAA) in section 164,514(a). Given that this study used only de-identified data and did not involve individually identifiable patient data, this study was exempt from Institutional Review Board Approval.

**Data Sharing Statement:** The data that support the findings of this study were obtained from the TriNetX Research Network and are available to other researchers upon request and with appropriate access permissions. De-identified aggregate-level data, a data dictionary describing the variables used, and the statistical code used for cohort creation and outcome assessment can be shared upon reasonable request to the corresponding author. Data access requires institutional credentials or collaboration with an institution that maintains a TriNetX license. Analyses may be replicated or extended within the TriNetX platform. There are no additional restrictions on the use of the shared materials beyond those imposed by the TriNetX user agreement.

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