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Evaluating Postoperative Outcomes of Mohs Surgery in the Elderly: A Retrospective Review of Large Repairs

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ABSTRACT

Background: As the geriatric population, defined by the National Institute on Aging as 65 years and older, continues to grow exponentially, understanding how age impacts the treatment of cutaneous malignancies has long been a mainstay in the practice of dermatology. Despite the known immunologic and morphologic deterioration of the skin barrier with time, few studies have assessed the role of advanced age in the outcomes of patients undergoing Mohs micrographic surgery and the associated extensive reconstruction of their cutaneous defect.

Objective: To compare the complication rates of large flaps ≥30 cm^2 and complex linear closures (CLC) ≥12.5 cm, between younger (18-64) and older (65+) age groups.

Materials and Methods: A retrospective chart review was conducted on a cohort of patients presenting at our institution's Mohs Micrographic Surgery Center for tumor removal from January 1, 2010, to December 31, 2022, and whose defects were repaired with large CLCs or flaps. Demographic data and outcomes were collected and analyzed.

Results: For all assessed complications, including infection, hematoma formation, bleeding, dehiscence, and necrosis, we found similarly low and no significant differences in the postoperative rates when comparing younger (18-64 years) and older (≥65 years) age groups.

Conclusion: Our data suggests that large CLC and flaps can be safely performed in elderly patients without a significant increase in complication rates.

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INTRODUCTION

As individuals age, morphological and immunological changes affect the skin's function as a protective barrier. These changes not only influence the skin's appearance but also its capacity to heal after injury, including surgical incisions.[1]

While Mohs Micrographic Surgery provides high cure rates, excising tumors can lead to complex defects necessitating extensive cutaneous repairs, such as linear closures and flaps. With the increasing number of skin cancer patients, particularly those over 65 undergoing Mohs surgery, assessing the outcomes of these large repairs is crucial.[2-3]

We conducted a retrospective chart review of adult patients presenting at the UCSD Dermatologic and Mohs Micrographic Surgery Center between January 1, 2010, and December 31, 2022. Of these patients, those who underwent dermatologic surgery with linear closures (LCs) ≥12.5 cm or flaps ≥30 cm^2 were included in this study (n=347).

Demographic data, such as age at the time of surgery, was recorded and all cases were categorized into two age groups: 18 to 64 and 65+ years old. Complications and other characteristic data were documented in Table 1. We utilized Tukey's multiple comparisons test through GraphPad Prism software to compare the mean differences in complication rates among age groups. Statistically significant differences were defined by an adjusted *P*-value of ≤0.05.

There was no significant difference in hematoma rates when comparing patients aged 18-64 and 65+ years old for both flaps (*P*=0.98, 4.7% vs 5.5%) and LC repairs (*P*=0.98, 5% vs 0%). The same was true when evaluating bleeding complication rates for flaps (*P*=0.98, 1.9% vs 2.5%) and LC repairs (*P*=0.98, 10% vs 0%). For LC cases, anticoagulation rates did not significantly vary (*P*=0.59, 30% vs 42.1%). However, anticoagulation rates were higher in patients aged 65+ who underwent flap repairs (*P*=0.0005, 25.2% vs 52.2%; Table 1).

TABLE 1.

Characteristics and Surgical Outcomes of Patients Diagnosed With Cutaneous Malignancy Categorized by Age

	Linear Closures (LC) in patients < 65 years of age (n=20)	Linear Closures (LC) in patients 65+ years of age (n=19)	Flaps in patients < 65 years of age (n=107)	Flaps in patients 65+ years of age (n=201)
Age (mean+/-SD, range, years)	54.55 +/- 6.02 (43-63)	77.95 +/- 8.26 (65-92)	56.1 +/- 4.6 (30-64)	76.5 +/- 8.0 (65-103)
Diabetes (%, n)	25.0% (n=5)	21.1% (n=4)	12.1% (n=13)	22.4% (n=45)
Immunosuppression (%,n)	35.0% (n=7)	15.8% (n=3)	35.5% (n=38)	20.4% (n=41)
On anticoagulation including aspirin (%, n)	30.0% (n=6)	42.1% (n=8)	25.2% (n=27)	52.2% (n=105)
On biologic medications (%, n)	0% (n=0)	5.3% (n=1)	1.9% (n=2)	4.0% (n=8)
Post-op size of defect (mean+/-SD, range, mm)	59.1 +/- 18.7 (35-102)	59.4 +/-14.8 (30-93)	42.0 +/-15.4 (18.0-100.0)	40.9 +/-14.5 (12.0-107.0)
Final surgical length (CLC) or area (flap) (mean +/- SD, range, cm or cm^2)	14.5 +/- 2.8 (12.6-23.9)	13.8 +/- 1.2 (12.6-17.3)	45.7 +/- 15.7 (30.1-90.6)	44.3 +/- 15.4 (30.0-100.0)
Prophylactic antibiotic (%,n)	50.0% (n=10)	36.8% (n=7)	79.4% (n=85)	81.6% (n=164)
Bleeding (%,n)	10.0% (n=2)	0% (n=0)	1.9% (n=2)	2.5% (n=5)
Hematoma (%,n)	5.0% (n=1)	0% (n=0)	4.7% (n=5)	2.8% (n=11)
Total Infection (%,n)	5.0% (n=1)	15.8% (n=3)	3.7% (n=4)	2.5% (n=5)
Infection while on antibiotics (%,n)	10.0% (n=1)	0% (n=0)	4.7% (n=4)	2.4% (n=4)
Dehiscence (%,n)	5.0% (n=1)	0% (n=0)	3.7% (n=4)	3.0% (n=6)
Flap necrosis (%,n)	N/A	N/A	2.8% (n=3)	2.5% (n=5)

The differences between age groups in dehiscence rates were not significant for LC cases (P>0.98, 3.7% vs 3.0%) and flaps (P>0.98, 5% vs 0%). Flap necrosis rates were similar (P>0.98, 2.8% vs 2.5%), and for both repair types, no difference (P>0.98, 5% vs 15.8%, 3.7% vs 2.5%) was found in overall infection rates. Rates of postoperative treatment with prophylactic antibiotics and comorbidities did not significantly vary with age for both LC and flap cases (Table 1).

While age has shown to be a factor in delayed wound healing, it does not present an increased risk of postoperative complications following large linear closures and cutaneous flap reconstructions in Mohs patients.[4] Our single-center retrospective chart review study further supports the positive outcomes of Mohs surgery and its associated linear closure or flap repair as a treatment option for skin cancers in geriatric patients over the age of 65.

Limitations of this study include its limited sample size and retrospective design. Future directions could involve analyzing other closure types, such as skin grafts, and evaluating additional factors, such as anatomical location of defects and including lesions of all sizes.

DISCLOSURES

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