

RESEARCH LETTER

Evaluating the Role of Age in Healing Times for Radiation Dermatitis

Aneri Patel BS¹, Jeffrey Fine MPH², Zainab Akinjobi MSc², Oma Agbai MD¹

¹ Department of Dermatology, University of California, Davis, Sacramento, CA, USA

² Division of Biostatistics, Department of Public Health Sciences, University of California Davis, Sacramento, CA, USA

ABSTRACT

Introduction: While previous research has focused on RD management, little is known about the relationship between age and healing times.

Methods: Adult patients with cancer and RD were identified via ICD-10 codes from the Patient Research Data Registry. Univariable analyses using Kaplan–Meier estimators with log-rank tests assessed survival outcomes.

Results: Younger patients had shorter times from the end of RT to resolution ($p = 0.018$) and from diagnosis to resolution ($p = 0.02$), suggesting that age influences recovery post-radiation injury.

Discussion: Older patients may benefit from tailored interventions, such as enhanced wound care protocols or skin barrier therapies. Incorporating age into RD management algorithms could optimize treatment plans and help mitigate delayed healing.

INTRODUCTION

Radiation dermatitis (RD) is a common adverse effect caused by ionizing radiation during cancer therapy, affecting approximately 95% of patients undergoing radiation therapy (RT).¹ RD manifests as erythema, dry or moist desquamation, leading to challenges like treatment interruptions and reduced quality of life. While previous research has focused on RD management, little is known about factors influencing its resolution time. Prior studies have examined demographics and treatment variability in RD severity; however, the relationship between age and healing times remains understudied.²

Skin regeneration and immune response decline with age, making it essential to understand how age impacts RD resolution to improve post-RT care. This retrospective study assessed the association between age and RD healing times, measured from the end of RT and RD diagnosis to resolution. Findings may guide strategies to enhance supportive care for RT patients.

METHODS

This retrospective study included patients treated with RT at the University of California Davis (UCD) Medical Center (2000–2024) and was approved by the UCD institutional research board. Adult patients with cancer and RD were identified via ICD-10 codes

Table 1: Baseline patient characteristics (n=21)

Variable	Type I, N = 91	Type II, N = 81	Type III, N = 41
Race/ethnicity			
Asian	0 (0%)	0 (0%)	2 (50%)
Hispanic/ Latino	0 (0%)	1 (13%)	0 (0%)
White	9 (100%)	7 (88%)	2 (50%)
Sex			
F	5 (56%)	6 (75%)	2 (50%)
M	4 (44%)	2 (25%)	2 (50%)
Age			
Minimum	37	57	56
25%	71	66	67
75%	88	77	76
Mean (SD)	77 (17)	71 (8)	72 (14)
BMI			
Minimum	18.1	21.5	18.3
25%	19.0	22.6	30.1
75%	26.3	30.2	38.9
Mean (SD)	24.2 (6.4)	27.4 (5.1)	33.5 (11.1)
n (%)			

from the Patient Research Data Registry. Demographic and clinical data (age, sex, race/ethnicity, Fitzpatrick skin type, and BMI) were collected (**Table 1**). Healing times were defined as days from RT completion and RD diagnosis to resolution. Patients were

grouped by age (≤ 70 years or > 70 years) and Fitzpatrick skin types (I–VI).

Univariable analyses using Kaplan–Meier estimators with log-rank tests assessed survival outcomes. Statistical analyses were

conducted with R Statistical Software Version 4.2.0, with significance set at 0.05.

RESULTS

Time-to-event analysis revealed no significant differences in healing times among Fitzpatrick skin types I–III. However, stratified analysis showed patients aged ≤ 70 years resolved RD faster than those >70 years. Younger patients had shorter times from the end of RT to resolution ($p = 0.018$) (**Figure 1**) and from diagnosis to resolution ($p = 0.02$), suggesting that age influences recovery post-radiation injury.

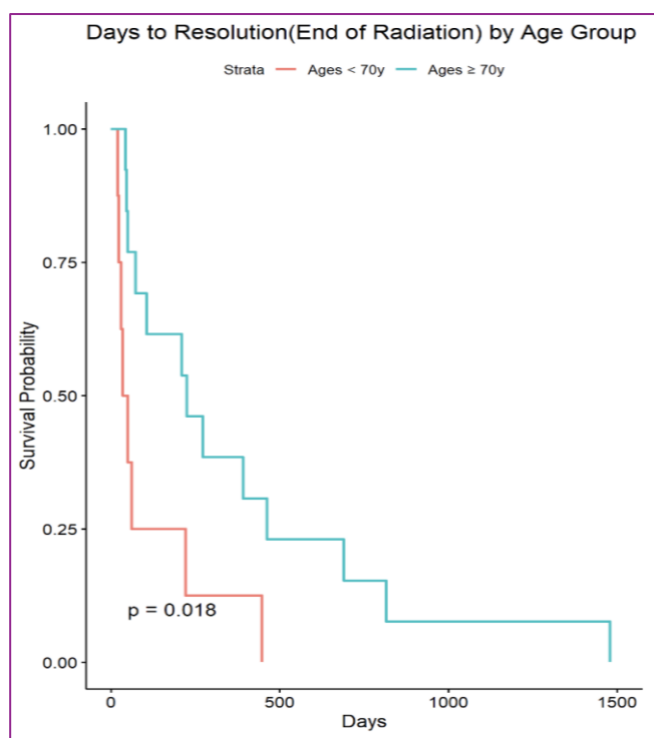


Figure 1: Kaplan-Meier Curve: Days to Resolution of Radiation Dermatitis from End of Radiation to Resolution by Group 1, age <70 years old and Group 2, age >70 years old

DISCUSSION

Patients aged ≤ 70 years experienced significantly faster RD resolution compared to those aged >70 years, consistent with research linking aging to slower skin repair mechanisms, delayed epithelial regeneration, and reduced dermal collagen production.³ Diminished immune responses and reduced angiogenesis in older adults likely contribute to delayed healing.⁴ Fitzpatrick skin type did not significantly affect healing times, contrasting with studies suggesting melanin influences radiation injury susceptibility.⁵ Limited representation of higher Fitzpatrick types (IV–VI) underscores the need for diverse populations in future research.

Older patients may benefit from tailored interventions, such as enhanced wound care protocols or skin barrier therapies. Incorporating age into RD management algorithms could optimize treatment plans and help mitigate delayed healing. Limitations include the retrospective design, small sample size ($n=21$), and potential confounding factors such as comorbidities, systemic therapies, and nutritional status. Future studies should address these limitations with larger, diverse populations and more variables. In conclusion, age significantly impacts RD healing times, with younger patients recovering faster. These findings highlight the need for personalized RD management, especially for older patients undergoing RT.

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Corresponding Author:
Aneri Patel BS
University of California, Davis
Sacramento, CA, USA
Email: abppatel@ucdavis.edu

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