



# Trends in Treatment and Survival Outcomes for Cutaneous Angiosarcoma: A SEER-Based Analysis, 2000-2022

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## Purpose

Cutaneous angiosarcoma (cAS) is a rare, aggressive skin cancer with poor prognosis and poorly defined national treatment guidelines. This study evaluates patterns in the use of surgery and radiation for cAS using a widely validated epidemiologic database, with a focus on two predominant and clinically distinct anatomical subgroups: scalp/face and trunk/extremities. We aim to assess whether the addition of radiation to surgery confers a survival advantage and to explore differential treatment strategies across anatomical sites.

## Introduction

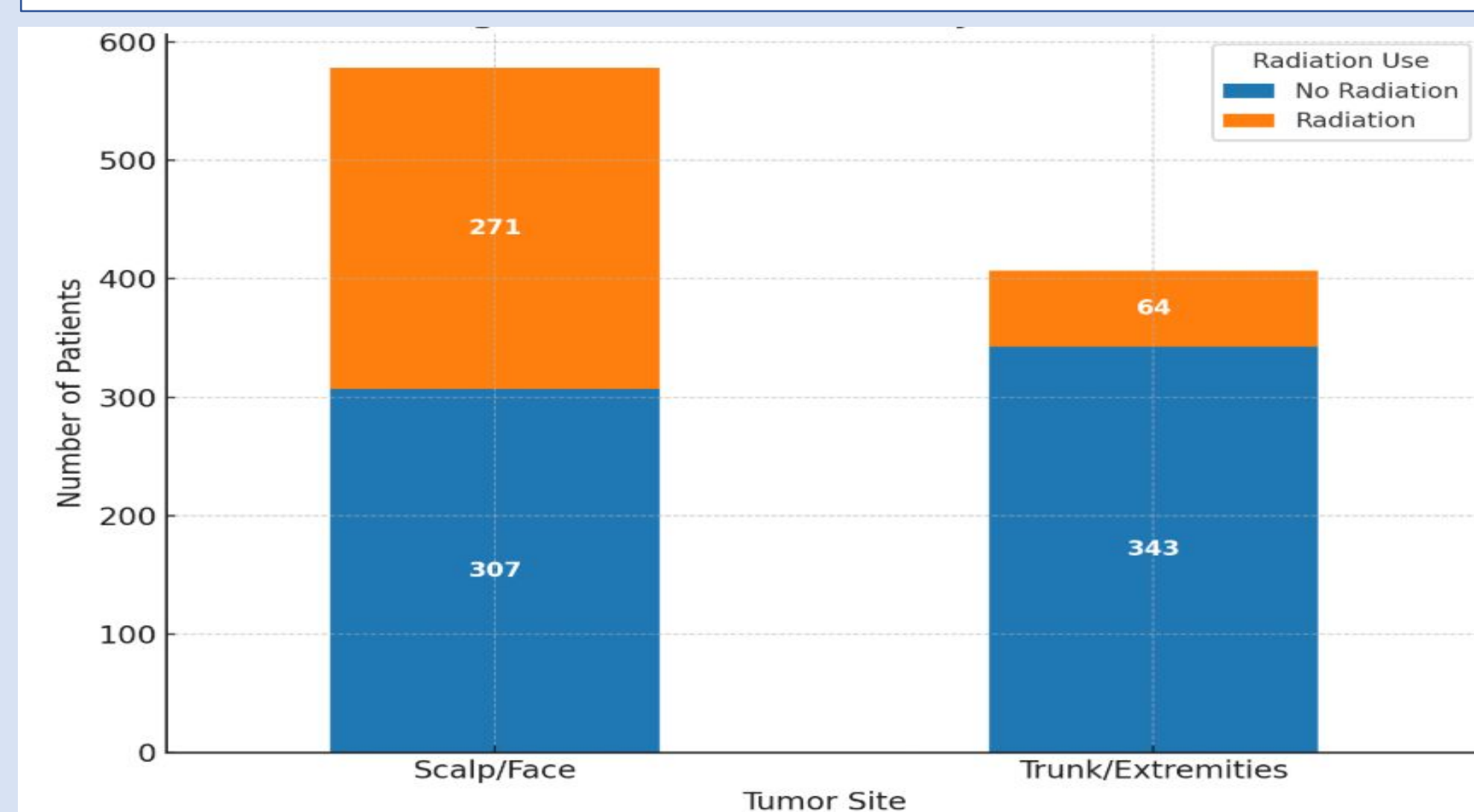
- cAS most commonly arises on the scalp and face of elderly adults and is often misdiagnosed due to its benign appearance, leading to delayed treatment.
- With a 5-year survival of only 30–50%, optimal management remains controversial.
- While radiation therapy is frequently recommended alongside surgery, especially for head and neck lesions, there is limited population-level evidence to support this approach.
- This study leverages SEER data to characterize treatment trends and survival outcomes by site and modality.

## Methods

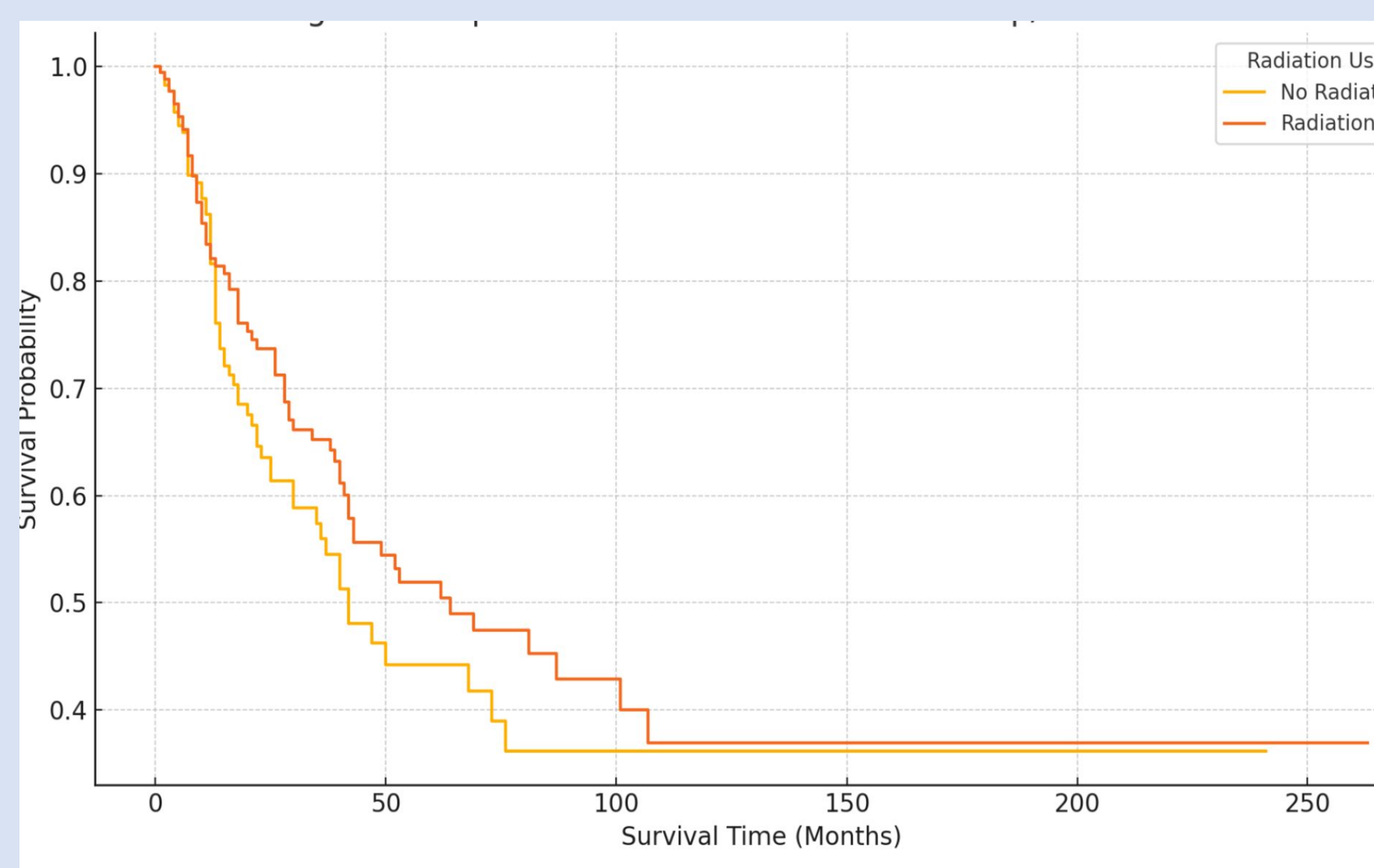
- This retrospective cohort study utilized data from the Surveillance, Epidemiology, and End Results Database (18 registries), covering the years 2000 to 2022.
- Patients were included if they had histologically confirmed cutaneous angiosarcoma (cAS), identified using ICD-O-3 histology code 9120/3 and primary site codes corresponding to the skin (C44.x). A total of 985 eligible cases were identified for analysis.
- Patients were stratified into two anatomical subgroups based on tumor location: scalp/face and trunk/extremities. The cohort was further categorized by treatment modality into those who received radiation in addition to surgery.
- Patients who underwent radiation therapy alone or received no documented treatment (n=53) were excluded from survival analyses due to limited sample size and heterogeneity.
- Descriptive statistics were used to summarize demographic and clinical characteristics. Kaplan-Meier survival curves were generated to compare overall survival between treatment groups within each anatomical subgroup.
- Cox proportional hazards regression was used to explore the independent association of radiation therapy with survival.

## Results

Of 932 patients with cAS who were included in the study, 578/62.0% had scalp/face tumors while 354/38.0% had trunk/extremity tumors. Radiation was used more frequently for scalp/face tumors (271/46.9%) than trunk/extremity tumors (64/18.1%) ( $p<0.001$ ) (Figure 1). Survival was similar for both tumor groups regardless of radiation use ( $p=0.51$ ) (Figure 2).



**Figure 1.** Stacked bar chart showing radiation use by tumor site among patients with cutaneous angiosarcoma. Radiation was administered more frequently in scalp/face tumors ( $p<0.001$ ).



**Figure 2.** Kaplan-Meier survival analysis among patients with cutaneous angiosarcoma. No statistically significant difference in disease-specific survival was observed between those who received radiation and those who did not ( $p=0.51$ ). Median survival was comparable between groups.

## Discussion

- This study found no survival benefit from adding radiation to surgery in either scalp/face or trunk/extremity tumors.
- In trunk/extremity tumors, radiation was associated with the same unadjusted survival, likely reflecting clinical selection for higher-risk cases.
- Despite this, radiation use was lower in trunk/extremity cases, suggesting variation in therapeutic preference, not necessarily a care access issue.
- Given the absence of a clear benefit, these findings raise critical questions about potential use of radiation in some patients, particularly when the treatment carries morbidity without improving outcomes.
- However, limitations in SEER, particularly the absence of tumor size, grade, depth, or recurrence, prevent definitive conclusions about efficacy.

## Conclusions

- Radiation therapy, when added to surgery, was not associated with improved survival in either major anatomical subgroup of cAS.
- Its lower use in trunk/extremity tumors suggests differential clinical strategies, not necessarily underuse.
- These results support the need for more selective application of radiation therapy and underscore the urgency for prospective, granular data to identify patient subgroups that may benefit from multimodal treatment.

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