ADENOID CYSTIC CARCINOMA SALIVARY GLANDS: PATTERN OF RECURRENCE AND ITS CORRELATION WITH CLINICOPATHOLOGICAL FEATURES AND RADIOTHERAPY

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Introduction

- Adenoid cystic carcinoma (ACC) is a **rare** malignancy, accounting for **~10%** of all salivary gland tumors and **~30%** of minor salivary gland neoplasms.
- It typically presents in the **fifth to sixth decades of life** as a slow growing but infiltrative mass, often associated with pain due to perineural invasion.
- ACC is characterized by a **high risk of local recurrence and distant metastasis**, often occurring many years after initial treatment.
- **Surgical resection** with **negative margins** is the primary treatment, with **adjuvant radiotherapy** recommended for adverse pathological features.
- Data from resource-limited settings are scarce, highlighting the need for further studies.

Methods

- We retrospectively reviewed patients with salivary gland ACC treated with radiation therapy (RT) between June 2007 and February 2024 at our institution.
- **Inclusion criteria:** histologically proven ACC of major or minor salivary glands treated with RT.
- **Data collected:** demographics, clinical presentation, pathological features, treatment details and follow-up.
- **Outcome measures:** patterns of recurrence (local, regional, distant), progression-free survival (PFS) and overall survival (OS).
- Correlation of recurrence with clinicopathological features and radiotherapy dose was performed using Pearson correlation and multivariate analysis.
- Descriptive statistics were used.

Key Findings

- **Fifty patients included** (median age **49 years**).
- **Majority** had **stage III–IV disease** (57%).
- Most had **low-grade tumors** (64%).
- **Surgery** was performed in 46 patients and all received RT (median dose 50 Gy).
- At a **median follow-up of 11 years**, **38%** developed recurrence.
- **Distant metastasis** was the predominant pattern, most commonly to the lungs (36%).
- **Higher stage, higher grade** and **perineural invasion** were significantly associated with increased risk of progression.
- **Higher RT dose and elective neck dissection** were associated with reduced risk of recurrence.

Patient and Tumor Characteristics (n = 50)

Characteristic	n (50)	%
Median age (years, range)	49 (18–78)	–
Gender		
Male	24	48%
Female	26	52%
Stage (AJCC)		
I–II	21	43%
III–IV	29	57%
Histological grade		
Low grade	32	64%
High grade	18	36%
Treatment		
Surgery	46	92%
Radiotherapy (all patients)	50	100%
Radiotherapy dose (Gy)		
Median (range)	50 (40–66)	–

Patterns of Failure (n = 19)

Site of First Recurrence	n	%
Distant metastasis (any site)	13	68%
Lung	7	36%
Bone	2	10%
Liver	2	10%
Other sites	2	10%
Local recurrence only	3	16%
Regional (nodal) recurrence only	2	11%
Local + regional	1	5%

Survival Outcomes

Outcome	Median (years)	95% Confidence Interval
Progression-Free Survival (PFS)	**9.41**	**6.87 – 11.96**
Overall Survival (OS)	**12.81**	**4.29 – 21.33**

Figures

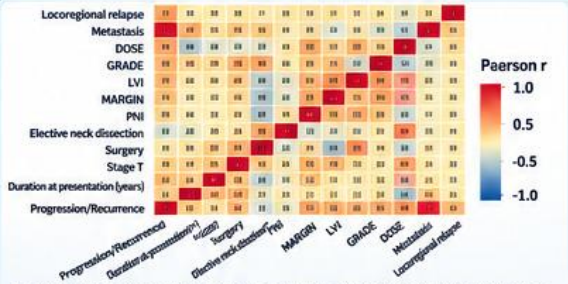


Figure 1: Pearson correlation heatmap of progression/recurrence with clinical factors

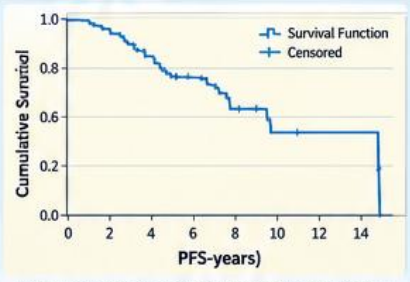


Figure 2: Kaplan-Meier survival curve showing progression free survival

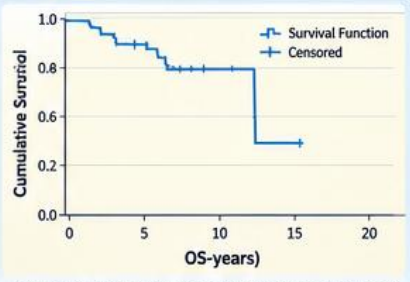


Figure 3: Kaplan-Meier survival curve showing overall survival

Results

- Fifty patients with salivary gland ACC were treated during the study period.
- Median age was 49 years (range 18–78 years).
- Most had stage III–IV disease (57%) and low-grade tumors (64%).
- At a median follow-up of 11 years, **38%** developed recurrence, predominantly distant metastases (68%), most commonly to the lungs (36%).
- Median PFS was **9.41 years** (95% CI: 6.87–11.96).
- Median OS was **12.81 years** (95% CI: 4.29–21.33).

Conclusion

- Distant metastasis is the predominant pattern of failure in salivary gland ACC.
- Higher stage, higher grade and perineural invasion increase the risk of recurrence.
- Higher radiotherapy dose and elective neck dissection are associated with improved outcomes.
- Risk-adapted treatment strategies and long-term surveillance are essential to improve survival.

Key Messages

- ACC is a rare but indolent malignancy with high risk of late recurrence, particularly distant metastasis.
- Clinicopathological factors and radiotherapy dose influence recurrence risk.
- Long-term follow-up is essential.
- Risk-adapted and multidisciphirary management may improve outcomes, especially in resource-limited settings.