

Adenoid Cystic Carcinoma in Unusual Locations – Differential Diagnosis Difficulties

Heather A. McMahon, B.S. and Madalina Tuluc, MD

Department of Pathology, Jefferson Medical College of Thomas Jefferson University, Philadelphia, PA

Abstract: Adenoid Cystic Carcinoma (ACC) is an uncommon malignant salivary gland tumor, representing 1% of all malignant tumors of the oral and maxillofacial region and 22% of all salivary gland malignancies. Although in the majority of cases ACC manifests in the major salivary glands, in rare instances it can be found in locations such as the esophagus, larynx, trachea, lacrimal gland, breast, prostate, lungs, or auditory canal. These unusual locations of ACC often pose a diagnostic challenge to the clinician and are associated with poorer outcomes for patients as compared to those ACC of a more typical presentation. In this study we examined three cases of ACC, originating in the external auditory canal, larynx, and trachea, highlighting the hallmark features that may aid the clinician in their detection.

Introduction:

- ACC is composed of epithelial and myoepithelial cells with locally invasive growth and high propensity for local recurrence and distant metastasis. It grows in one of three characteristic patterns: glandular, tubular, or solid.
- Predictors of prognosis, are invasion of major nerves, margin status, and stage.
- Most commonly, ACC presents as a mass in one of the major or minor salivary glands, frequently associated with pain.
- Standard of care for ACC: surgical resection followed by radiation therapy.
- Activation of the novel fusion protein, MYB/NFIB, is a major oncogenic event in ACC. In addition to its utility as a biomarker, it may prove useful as a novel therapeutic target.

Results:

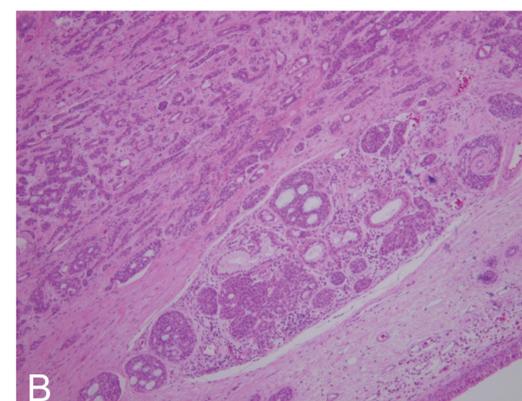
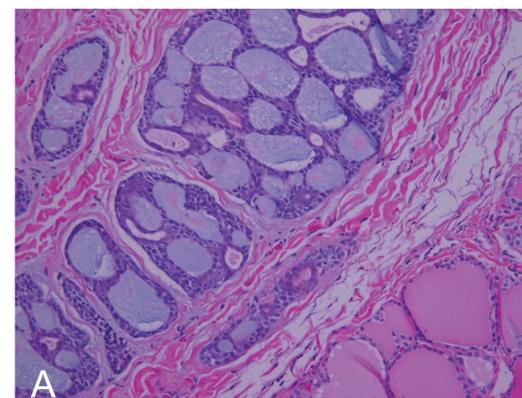
Case # 1:

- 44 year-old female presented in 1997 with right ear otalgia, unable to be relieved by antibiotics.
- A mass was identified in her external auditory canal (EAC), biopsy confirmed ACC. She underwent subsequent surgical resection.
- The tumor recurred in 2004, presenting with right ear otalgia. She underwent surgical resection followed by radiation.
- In 2007, she presented with discomfort in the right parotid and periauricular region and was found to have a new recurrence. She underwent resection of the recurrent tumor with negative margins. No evidence of disease at the last follow-up in December 2008.

Results:

Case #2:

- 56 year-old female with past medical history significant for moderate alcohol intake and remote history of smoking presented to her primary care physician in 2011 complaining of several months of hoarseness, difficulty breathing during sleep, and feelings of choking.
- CT and MRI of the neck showed a vocal cord mass and direct laryngoscopy demonstrated a lesion replacing the left hemi-larynx with submucosal spread and extension to the cricoid cartilage.
- Total laryngectomy and bilateral neck dissection revealed ACC and was followed by radiation therapy.
- She is currently alive with no evidence of disease at the present time, but under close follow-up due to the high risk of recurrence.



A: Microscopic image of tissue obtained from exploratory surgery demonstrating tracheal ACC infiltrating the thyroid.

B: Microscopic image of tracheal ACC obtained from an excisional specimen.

Case # 3:

- 40 year-old male presented in September 2009 with difficulties breathing and asthma-like symptoms, which were resistant to medical intervention.
- CT of the neck revealed a soft tissue mass involving the tracheoesophageal groove with involvement of the cricoid region. Direct laryngoscopy revealed erythema and edema of the subglottic airway.
- Exploratory surgery demonstrated a mass arising from the right tracheoesophageal groove and extending to replace most of the right thyroid lobe. Microscopic examination showed ACC.
- Total laryngectomy with paratracheal dissection was performed followed by radiation therapy. The patient is currently disease-free.

Methods: We conducted a retrospective chart review of three patients presenting with ACC in unusual locations in the head and neck area.

Conclusions:

- ACC is uncommonly encountered in locations outside of the major salivary glands, however it is of vital importance for clinicians to keep it in the differential.
- ACC of the EAC, presenting with otalgia, otorrhea, and a mass in the EAC, may be confused with otitis media.
- Laryngeal ACC most commonly presents as a submucosal mass. Tumors of the supraglottis present with dysphagia and hoarseness, whereas airway compromise is more frequently associated with subglottic tumors. These tumors may be misdiagnosed as squamous cell carcinoma.
- Tracheal ACC manifests with refractory asthma-like symptoms.
- Maintaining an index of suspicion for ACC is particularly important in patients whose symptoms are refractory to treatments of ailments typical to the anatomical location.
- Identification of specific molecular biomarkers may open new avenues not only for better prognostic stratification, but also for much needed individualized treatment in this disease.

References:

1. Ellington, CL; Goodman, M; Owonikoko, T; et al. Adenoid Cystic Carcinoma of the Head and Neck: Incidence and Survival Trends Based on 1973-2007 Surveillance, Epidemiology, and End Results Data. *Cancer*. 2012; 118(18): 4444-4451.
2. Lin, Y; Chen, K; Lin, C; et al. Clinicopathological features of salivary and non-salivary adenoid cystic carcinomas. *Int. J. Oral Maxillofac. Surg*. 2012; 41: 354-360
3. Veeratterapillay, R; Veeratterapillay, S; Ward, E; et al. Adenoid cystic carcinoma of the breast: case report and review of literature. *R Coll Surg Engl* 2012; 94: e137-e138.
4. Min, R; Siyi, L; Wenjun, Y; et al. Salivary gland adenoid cystic carcinoma with cervical lymph node metastasis: a preliminary study of 62 cases *Int. J. Oral Maxillofac. Surg*. 2012; 41: 952-957.
5. Brill, LB; Kanner, WA; Fehr, A; et al. Analysis of MYB expression and MYB-NFIB gene fusions in adenoid cystic carcinoma and other salivary neoplasms. *Modern Pathology*. 2011; 24, 1169-1176.
6. Dong, F; Gidley, PW; Ho, T; et al. Adenoid Cystic Carcinoma of the External Auditory Canal. *Laryngoscope*. 2008; 118(9): 1591-1600.
7. Ganly, I; Patel, SG; Coleman, M; et al. Malignant Minor Salivary Gland Tumors of the Larynx. *Arch Otolaryngol Head Neck Surg*. 2006 Jul; 132(7): 767-770.
8. Yang, P; Liu, M; Chen, C; et al. Adenoid Cystic Carcinoma of the Trachea: a Report of Seven Cases and Literature Review. *Chang Gung Med J*. 2005; 28(5): 357-362.
9. Wen, L; Wen, H; Yan, F; et al. Adenoid cystic carcinoma of trachea: a case report and review of literature. *Chin Med J* 2012; 125(12): 2238-2239.