Oral Oncology 67 (2017) 192–197

Contents lists available at ScienceDirect

Oral Oncology

journal homepage: www.elsevier.com/locate/oraloncology

Review

# Clinical features of ectomesenchymal chondromyxoid tumors: A systematic review of the literature

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ARTICLE INFO

*Article history:*
Received 10 November 2016
Received in revised form 31 January 2017
Accepted 20 February 2017

*Keywords:*
Tongue neoplasms
Head and neck tumors
Ectomesenchymal chondromyxoid tumors
Oral tongue
Base of tongue

ABSTRACT

Ectomesenchymal chondromyxoid tumors are rare, benign neoplasms of the head and neck most commonly found within the oral cavity. While histopathological evaluation has been the primary focus of prior studies, clinical characterization of this rare entity currently remains sparse. Thus, this study was performed to provide insights into the clinical characteristics of ectomesenchymal chondromyxoid tumors to aid clinicians in distinguishing the lesion from other benign and malignant processes for a more accurate diagnosis and treatment. Moreover, this study includes a unique case of ectomesenchymal chondromyxoid tumor arising in the base of tongue, now the fourth to arise at that anatomic site. Including this case, a systematic review of the literature identified only 60 individual cases reported thus far. This study provides a detailed analysis of all 60 cases including demographics, clinical presentation, radiographic imaging, follow-up, and recurrence rate.



## Introduction

Ectomesenchymal chondromyxoid tumors (ECT) are rare, benign, soft tissue tumors exclusively found in the oral cavity and oropharynx [1]. They commonly present as submucosal, dome-shaped or sessile, firm, slow-growing, and painless masses primarily involving the dorsum of the oral tongue [1]. Though rare, ECTs can be found in other locations such as the base of tongue (BOT) and hard palate [1–3]. The condition was initially described in a case series by Smith et al. in 1995, followed by numerous case reports, including the present case, accumulating to a total of approximately 60 individual cases to date [4]. Of these, only four individual cases, including the present case, have arisen in the BOT. With the rapid rise in squamous cell carcinoma of the BOT that may also occur submucosally, it is important for clinicians to be aware of this entity to help distinguish it from other tumors. There have been extensive reports on the tumor's histopathologic features, while coverage of its clinical characteristics have been relatively scarce.

Prior studies focus on the primary location of ECTs, being the dorsal portion of the tongue within the oral cavity, and report the condition generally presenting between the first and eighth decade without gender predilection [1,4–6]. Lesions have been reported to range from 5 to 20 mm in largest dimension with symptoms varying in duration [1,4,5]. Studies have briefly mentioned radiographic characteristics in three cases, each employing different modalities. Computed tomography (CT) without contrast of a BOT lesion was observed to be large and cystic, while a separate oral tongue mass evaluated by T1-weighted magnetic resonance imaging was described as simply irregular [2,5]. Finally, in another case of the oral tongue, ultrasonography was reported to reveal a hyperechoic lesion residing within the submucosal layer [7]. Among these studies, only one included imaging in the publication. With sparse information on diagnostic imaging modalities, definitive diagnosis currently relies on histopathology. Given its benign nature, accessible anatomic localizations, and few reported recurrences, complete surgical excision of the tumor is typically recommended and likely the best treatment option, though three cases have reported to recur [2,4,8]. The follow-up duration varies in literature, and therefore, cannot predict the rate of recurrence.

*Abbreviations:* ECT, ectomesenchymal chondromyxoid tumor; BOT, base of tongue; CT, computed tomography; WHO, World Health Organization; TORS, Transoral Robotic Surgery; HPV, human papilloma virus; OPSCC, oropharyngeal squamous cell carcinoma; GFAP, glial fibrillary acidic protein; MRI, magnetic resonance imaging.

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http://dx.doi.org/10.1016/j.oraloncology.2017.02.021
1368-8375/

To date, the etiopathogenesis of ECTs remains unknown. However, the theory of an embryological neural crest origin has gathered the largest attention [2,4,5]. This idea is illustrated in Yoshioka et al.'s study, which tested cultured cells with immunohistochemical staining and reverse-transcriptase polymerase chain reaction to identify the tumor cells as ectomesenchymal with a neural crest origin [5].

Currently, the World Health Organization (WHO) classifies ECT as a type of myoepithelioma. Though some argue that each pathology is a variant of the same entity, there are clear immunohistopathological discrepancies that distinguish one from the other [1,2,4,9–11]. On gross examination, ECTs are well demarcated, non-capsulated, and lobular. Histologically, the tumors have a myxoid to chondromyxoid background, indicating a multipotent quality of the tumor [12]. Within this background are oval, spindle-shaped, polygonal, and round cells arranged in sheets, cords, and strands [2,6]. At times, atypia and multilobulated nuclei are observed [1,5]. Immunohistochemical staining profiles are typically positive for glial fibrillary acidic protein (GFAP), cytokeratins, vimentin, smooth-muscle actin, CD56, CD57, desmin, and S100 [2,5,13]. Although a few variations in immunohistological profiles are seen amongst these tumors, histopathological examination is the most effective method to differentiate the lesion from others with similar clinical presentations. Such lesions include soft tissue myxomas, myoepitheliomas, and pleomorphic adenomas [1,14]. Histopathological examination supplemented with immunohistochemical staining is therefore considered the most comprehensive tool when diagnosing ECTs [1,4,13,14].

Due to the multiple, small case reports primarily focusing on histopathology, the rise of HPV-associated oropharyngeal squamous cell carcinoma (OPSCC) in Caucasian males, and rising incidence of oral tongue cancer in younger females without risk factors, the goal of this study is to provide a comprehensive systematic review. This is expected to allow clinicians to be aware of the clinical and radiographic findings that differentiate these tumors from more benign, but also, more aggressive malignancies resulting in accurate diagnosis and treatment.

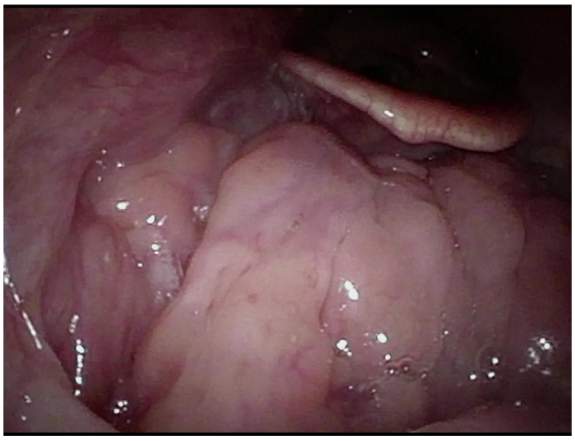

**Fig. 1.** Fiberoptic endoscopy revealing a right-sided, 3–4 cm submucosal mass at the base of tongue.

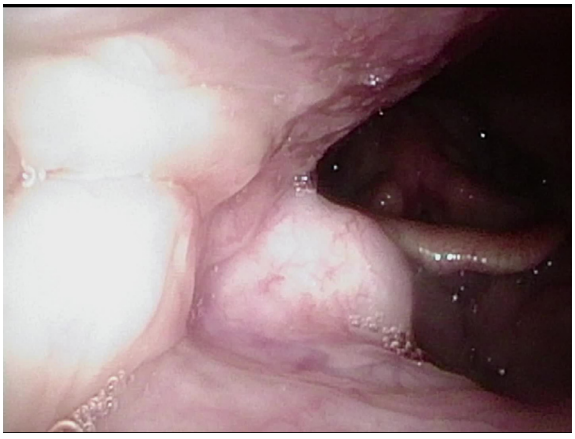

**Fig. 2.** Fiberoptic endoscopy revealing a right-sided, 3–4 cm submucosal mass at the base of tongue, including the glossotonsillar sulcus.

## Case report

A 34-year-old man presented to the multidisciplinary Head and Neck Tumor center at the Medical University of South Carolina for a consultation regarding a slowly enlarging mass in the back of his tongue on the right side. He had an extensive history of chronic ear-related conditions accompanied by numerous operations, which eventually led to the placement of bilateral hearing aids. The lesion was first identified a decade ago, at his initial evaluation for hearing loss and ear drainage. His physicians did not consider it neoplastic at the time, and therefore, no diagnostic or treatment plans were made. The mass has remained ever since. A biopsy was obtained prior to referral by an outside community otolaryngology practice which revealed "extravasated mucin within connective tissue and foci of epithelium within the mucin" with interpretation that "these findings could represent a ranula, or even a small sampling of a mucoepidermoid carcinoma". His only other complaint was a change in voice over the prior few months. The patient reported to be a former smoker of 1 pack per day.

On physical exam, the patient was a well-developed, well-nourished, healthy-appearing male. There was no audible dysphonia, stridor, or airway distress although he had some mild resonance changes in his voice. Examination of the oral cavity revealed a raised, firm, non-ulcerated, and non-tender mass on the dorsum of his right BOT. It measured at 3–4 cm in size (Figs. 1 and 2). There was no palpable adenopathy or masses appreciated in levels I-VI of the neck. The remaining portions of the exam were unremarkable.

CT of the neck showed a $3.8 \times 2.8 \times 3.8$ cm mass with mild heterogeneous enhancement at the right BOT. The lesion had extensions along the lateral pharyngeal wall and to the right soft palate (Fig. 3).

The patient was subsequently taken to the operating room for surgical resection of the mass by Transoral Robotic Surgery (TORS) under general anesthesia. The site of the initial biopsy was identified and resected with clear clinical margins for diagnostic purposes. The patient was admitted for overnight observation and resumed a normal diet the following day without complications.

Postoperatively, the histologic examination revealed a well-circumscribed, white, firm lesion, measuring 4.2 cm in greatest dimension with focal extension within 1 mm of the margin. Routine hematoxylin and eosin- (H&E) stained sections showed a well-demarcated nodule with areas of varying cellularity and lack of invasion into surrounding structures (Fig. 4). On higher power, the tissue consisted of a chondromyxoid background with small, bland-appearing, round to spindled cells with hyperchromatic, uniform nuclei (Fig. 5). Immunohistochemical stains for S100, GFAP, CD56, p63, AE1/AE3, and Ki-67 showed cells reacting strongly with CD56, GFAP and S100, while returning negative for p63 and AE1/AE3. Additionally, the Ki-67 index was 1%, demonstrating a low level of proliferation. Taking into account the immunohistochemical staining pattern, the histopathologic