Ectomesenchymal Chondromyxoid Tumour of the Posterior Tongue

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Abstract Ectomesenchymal chondromyxoid tumor (ECMT) is a rare benign neoplasm arising in the tongue. With only 45 cases reported in the literature, there are several unique features defining this lesion. Firstly, almost all patients present with an asymptomatic slow growing mass on the anterior dorsum of the tongue. At the microscopic level, it is recognizable as a well-circumscribed unencapsulated proliferation of uniform round to fusiform cells embedded in a chondromyxoid matrix. Lastly, the immunohistochemistry profile is characterised by positivity for glial fibrillary acidic protein and frequent positivity for S-100 and cytokeratins. We report a case of a mass located on the posterior dorsum of the tongue and meeting the aforementioned morphological and immunohistochemical criteria of ECMT.

Keywords Ectomesenchymal chondromyxoid tumor · Tongue · Myoepithelioma · Immunohistochemistry

Case Description

The patient is a 43 year old male who presented to the Ears Nose and Throat clinic at the McGill University Health Center with odynophagia and mild dysphagia that had been

present for 3 months. He did not have any significant prior medical or family medical history, did not take medications, and did not smoke or consume alcohol. The patient felt a slowly growing mass at the back of his throat that would occasionally trigger a gag reflex and the sensation of narrowing of his throat. He had mild dysphagia but retained normal tongue strength, range of motion and sensation. On examination, an exophytic mass was visible on the back of the tongue that crossed the midline and was soft on palpation. The mass obliterated the space between the uvula and the palatoglossal arch.

A CT scan without contrast was performed which showed a large cystic appearing mass at the tongue base (Fig. 1). A fine needle aspiration of the mass produced 15 mL of red fluid. A cell block of the fluid was prepared and showed whorls of spindled cells with alternating hypercellular and hypocellular areas with scattered thin-walled vessels. Nuclear atypia was minimal and no mitotic figures were identified. Immunohistochemistry of the cell block showed positive staining for vimentin, GFAP, cyclin D1, synaptophysin and CD57. Desmin, factor VIII, myogenin and epithelial membrane antigen (EMA) staining were weak and/or patchy. Cytoplasmic beta-catenin staining was seen, but without nuclear stain. Immunohistochemistry was negative for cytokeratin (CK) AE1/AE3, CK5/6, p63, p16, HMB-45, CD34, CD31, c-kit, smooth muscle actin (SMA), bcl-2, factor XIIIa, calponin, neurofilament, S-100 and chromogranin. A low grade mesenchymal neoplasm was favored over a salivary gland neoplasm, and it was recommended that the patient have local resection for definitive diagnosis.

For the surgery, a mouth gag was introduced and the oral cavity was visualized. The tongue was grasped and a tonsillectomy gag was placed in the oral cavity to expose the base of the tongue. With the tongue retracted, the tumor

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Fig. 1 Axial CT image demonstrating a cystic 3.5 cm base of tongue lesion (arrow)

Fig. 2 Partial glossectomy specimen that has been serially sectioned post-buffered formalin (4 %) fixation and showing an ovoid, well-circumscribed and tan submucosal mass

was clearly seen and was dissected from the surrounding base using electrocautery. This was done to preserve the surrounding tongue base and neurovascular pedicle.

From the partial glossectomy specimen, the cystic lesion was found at the base below the mucosa (Fig. 2). The lesion was ovoid, well-circumscribed, tan and measured 3.5 cm on the longest axis and 2.2 cm on the shorter axes. The lesion was 30 % cystic and showed focal hemorrhagic areas. The surgical margins were free of tumor.

Histologic examination revealed the lesion to be unencapsulated with a pushing border and with the cystic degeneration that was observed grossly. The solid areas were composed of fusiform and elongated cells in net-like arrangements in a myxoid and mucinous background (Fig. 3a). Chondroid or hyalinised matrix were not observed. The nuclei were small and uniform without significant pleomorphism or hyperchromatism. The cells

had little to moderate amounts of cytoplasm (Fig. 3b). Some focal hypercellular areas were noted where the cells were more ovoid and formed more fascicular and whorled arrangements. Rare mitotic figures were observed. A few small blood vessels were found within the lesion. Mucicarmine staining showed some mild staining of mucinous background but this was not observed in hypercellular areas. Alcian Blue stains at pH 2.5 and periodic acid-Schiff stains were positive in the mucinous areas (Fig. 3c and d, respectively).

Similarly to the cell block, immunohistochemistry showed the tumor to be strongly positive for GFAP (Fig. 4a), vimentin, CD57 (Fig. 4b) and with strong nuclear and cytoplasmic staining for S-100 (Fig. 4c); weak-moderate positive staining for SMA (Fig. 4d); and weakly and focally positive staining for smooth muscle myosin heavy chain, CKAE1/AE3 (Fig. 4e), and desmin. The tumor cells were negative for p63, HMB-45, myogenin, 34 β E12, CK5/6 and CK8/18. CD31, CD34 and calponin (Fig. 4f) were only positive in the small blood vessels within the tumor. Ki-67 protein staining was present in only 5 % of the cells within the tumor.

Discussion

The present case differs from the majority of cases of ECMT by its posterior location. Prior to our lesion, only 2 of the 45 previously described ECMT arose in the posterior tongue [1, 2]. Nevertheless, despite lacking the typical anterior location, the current lesion possesses the described features of ECMTs. Morphologically, ECMT is a lobular, non-encapsulated proliferation of uniform round, ovoid, fusiform or polygonal cells embedded in a chondromyxoid matrix, without atypia and with scarce mitoses [3–5]. The only feature lacking in our tumor is the chondroid matrix. However, cases of ECMT lacking chondroid component were previously reported [2, 6, 7], which lead Palma Guzman et al. [7] to propose a sub-classification of “classic” and “chondroid-free” variants. Additionally, by morphology, previous investigators reported tumors with areas of hypercellularity containing cells displaying pleiomorphism, hyperchromatism and multinucleation [5]. Our case likewise contained areas of hypercellularity, although these did not show any evidence of atypia.

Most importantly, the conclusive evidence supporting the diagnosis of EMCT in our case is its immunohistochemical and histochemical staining profile. As exhibited by our case, the immunohistochemistry profile of ECMT includes positivity for GFAP and S-100 for most cases and variable positivity for cytokeratins, smooth-muscle actin (SMA), CD57 and desmin [3–5]. The matrix is classically

Fig. 3 **a** Low-power view showing submucosal circumscribed cystic lesion (hematoxylin-eosin, original magnification $\times 40$) **b** high-power view showing net-like arrangement of fusiform cells with bland nuclei (hematoxylin-eosin, original magnification $\times 400$) **c** strong

staining of acidic mucins (Alcian blue pH 2.5, original magnification $\times 400$) **d** strong staining for mucins (periodic acid-Schiff, original magnification $\times 400$)

faintly stains with mucicarmine and strongly strains with Alcian Blue.

The differential diagnosis for ECMTs is wide-ranging and spans numerous benign and malignant mesenchymal, mucinous or chondroid lesions of the tongue, including neurofibroma, schwannoma, focal oral mucinosis, soft-tissue myxoma, chondroid choristoma and chondrosarcoma. The majority of these lesions can be easily excluded on the basis of morphology or immunohistochemistry. The differential diagnosis likely representing the greatest challenge is myoepithelioma, which is a lesion that can present similar morphological and immunohistochemical features to an ECMT. Myoepitheliomas are seen to arise in salivary glands or in soft tissues. The former are generally not considered in the differential diagnosis for EMCTs, due to the absence of salivary gland tissue in the anterior dorsum of the tongue, when the tumor arises in this location. For our case, located in the posterior tongue, the absence of plasmacytoid cells or focal ductal formation helps distinguish EMCTs from myoepitheliomas. The actual challenge is with soft tissue myoepitheliomas, which can occur in the head and neck area in addition to its common location in the limbs. Morphologically, ECMTs

and soft tissue myoepitheliomas can be essentially identical. Indeed, in the most recent WHO classification of tumours of soft tissue and bone, soft tissue EMCTs are considered synonymous with soft tissue myoepitheliomas [8]. Nonetheless, subtle differences can be found by immunohistochemistry. Compared to ECMT, soft tissue myoepitheliomas more consistently stain positive for cytokeratins and less consistently for GFAP [8]. In addition, myoepitheliomas will stain for specific myoepithelial markers such as p63, calponin and smooth muscle myosin, whereas ECMT usually lacks staining for these antibodies [3, 5, 7, 8]. Therefore, an ECMT of the tongue is regarded as a well-established and separate entity in head and neck pathology [4]. Consequently, immunohistochemical analysis combined with the characteristic clinicopathological features of ECMT, tumors of the tongue presenting those features should be classified as ECMTs rather than myoepitheliomas.

The histogenesis of ECMT remains unknown. Smith et al. [5] originally considered two possible origins for the tumor, namely, from a minor salivary gland cells or from an uncommitted ectomesenchymal cell originating from the neural crest. Currently, the latter hypothesis is favored,

Fig. 4 Immunohistochemistry showing strong positive staining for **a** GFAP, **b** CD57, and **c** S-100; weak-moderate staining for **d** SMA; focal weak staining for **e** cytokeratin AE1/AE3 and negative staining

for **f** calponin (immunohistochemistry staining with horse-radish peroxidase and diaminobenzidine reaction, original magnification $\times 400$)

and the multilineage differentiation potential of the precursor cells lends explanation to the diverse immunohistochemical profile of ECMT [3, 5, 6, 9]. The minor salivary glands hypothesis has been questioned by investigators given the lack of salivary glands on the anterior dorsal tongue [5, 6]. However, in light of the possibility for ECMT to arise in the posterior dorsal tongue as demonstrated in the case presented, this hypothesis cannot be completely discarded.

Given the benign nature of ECMT, surgical excision is the preferred treatment. Recurrences have been reported in

only 4 cases to date, at intervals varying from 3 months to 20 years post-surgery [5, 10]. The rate of recurrence thus appears to be low with complete excision. Although the follow-up for the patient presented in this case is incomplete, there appears to be no sign of recurrence at 6 months post-surgery.

In conclusion, we report a case presenting all the histologic and immunohistochemical features of ECMT of the tongue. This rare tumor has previously been reported predominantly in the anterior tongue. We report the third case of this entity arising in the posterior tongue.

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