CASE REPORT

Basaloid squamous carcinoma simulating adenoid cystic carcinoma: Diagnostic dilemma

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Summary The adenoid pattern seen in Basaloid squamous carcinoma (BSC) and adenoid cystic carcinoma (ACC) of head neck region may form a major portion in biopsies and pose diagnostic difficulties. In the present case histology of tongue swelling revealed an adenoid pattern with squamous differentiation and keratin pearls in some of these adenoid spaces. The overlying mucosa showed an in situ squamous carcinoma. Immunohistochemical (IHC) stains showed CK and EMA positivity in squamous and adenoid areas, CEA was positive only in squamous areas while Vimentin and S100 protein were negative. These IHC stains thus helped in the distinction of BSC from ACC as ACC is clinically less aggressive.

KEYWORDS
Biopsy; Oral cavity; Basaloid squamous carcinoma; Adenoid cystic carcinoma

Introduction
The common tumours involving the base of tongue are squamous carcinoma, vascular tumours such as haemangioma, haemangiopericytoma, lymphangioma, angiosarcoma followed by Non-Hodgkin’s lymphoma, rhabomyosarcoma, smooth muscle tumours and salivary gland neoplasms. The treatment for each of these entities is disparate hence a correct pretreatment biopsy diagnosis is essential.

Basaloid squamous carcinoma and adenoid cystic carcinoma may mimic each other since each of these may comprise a dominant adenoid pattern which may be selectively represented in a small biopsy. Herein the role of keratin in differentiating an adenoid cystic carcinoma from a basaloid squamous cell carcinoma in a tumour located in the base of tongue is presented. The paper stresses the importance of making this distinction.

Case history
An 81-year-old patient presented to Tata Memorial Hospital, Mumbai, India with a swelling at the back of the tongue since 1 year. A biopsy elsewhere had been labelled as low-grade mucoepidermoid carcinoma. On examination of the oral cavity there was a large ulcerated tumour over the base of tongue extending to the right tonsillar fossa measuring 3 × 2 cm. There was no evidence of any lymphadenopathy or disease elsewhere either. Routine haematological investigations were found to be within the normal range. An MRI was done which revealed a polypoidal soft tissue neoplasm involving right tonsil, lateral wall of oropharynx and the base of tongue. The anterior two third of the tongue,
vallecula and epiglottis were normal. The mandible was normal. An enlarged right level II lymph node was noted.

Needle core biopsy of the tongue mass was done and a frozen diagnosis was asked by the surgeon. The frozen diagnosis offered was a salivary gland neoplasm with squamous metaplasia. At subsequent paraffin section, routine H and E stained slide revealed a tumour composed of solid nests of basaloid cells with scanty cytoplasm and hyperchromatic nuclei without nucleoli. The cells were arranged in small gland like spaces with an eosinophilic hyaline substance in the centre of these spaces (Fig. 1). The histology almost simulated an adenoid cystic neoplasm of the minor salivary gland. However some of the gland like spaces showed squamous differentiation in the form of keratin pearls and subtle nuclear abnormalities (Fig. 1). In addition the overlying squamous mucosa was ulcerated and revealed an in situ squamous carcinoma (Fig. 2). In view of the adenoid pattern a differential diagnosis of adenoid cystic carcinoma and basaloid squamous carcinoma was considered and a panel of immunohistochemistry stains comprising cytokeratin, vimentin, S100 protein, CEA and EMA as listed in Table 1 were done. CK was diffusely positive in both squamous and the non-squamous areas of the tumour (Fig. 3A). CEA was positive in the squamous areas only (Fig. 3B). EMA
stained all the cells diffusely. Vimentin and S100 protein were both non-reactive. A diagnosis of basaloid squamous carcinoma was given on the basis of these results.

**Discussion**

The diagnostic possibilities in a tumour arising in the base of tongue and showing an adenoid cystic pattern includes (i) a true adenoid cystic tumour of the salivary gland origin (ii) a mixed parotid tumour and (iii) basaloid squamous carcinoma with adenoid cystic pattern. The features of each of these are as follows:

(i) True adenoid cystic tumour of the salivary gland origin comprises small darkly stained uniform cells arranged in rounded groups; it has more or less circular spaces. The lumina of these spaces are filled with hyaline material or basement membrane material secreted by the myoepithelial cells. This tumour lacks keratin. Immunohistochemistry shows positivity to CEA only in the ductal cells and not the basaloid cells and S100 protein.

(ii) Mixed parotid tumour is a malignant tumour in which the malignant component could be an adenoid cystic carcinoma developing in an pleomorphic adenoma. This association is very rare.

(iii) Basaloid squamous carcinoma has solid nests of poorly differentiated cells in a lobular configuration closely apposed to the surface mucosa. The cells have scanty cytoplasm with dark hyperchromatic nuclei without nucleoli and small cystic spaces akin to adenoid cystic carcinoma. Basaloid squamous carcinoma always has a squamous component manifested as areas of typical squamous carcinoma, SIN or focal areas of typical squamous differentiation within the otherwise basaloid appearing tumour. This tumour has many variants, and it is rarely associated with spindle cell variant of squamous cell carcinoma.

The basaloid squamous carcinoma is likely to be confused with adenoid cystic carcinoma. When adenoid spaces dominate as in the present case, the presence of an in situ squamous component and keratin pearls favour squamous carcinoma. In the absence of these features immunohistochemistry helps to differentiate between adenoid cystic carcinoma and basaloid squamous carcinoma. CK and EMA were positive in all the tumour cells. CEA was positive in the squamous areas only, while vimentin and S100 protein were non-reactive indicating the absence of myoepithelial histogenesis. Adenoid cystic carcinomas usually show S100 protein, actin, and vimentin coexpression in the basaloid cells whereas in 60%–90% cases CEA is only seen in the ductal cells and not basaloid cells.

Clinical findings also aid in separating basaloid squamous carcinoma of head and neck from adenoid cystic carcinoma. The former strongly predilects hypopharynx, base of tongue, larynx or tonsil and is frequently accompanied by cervical lymph node metastasis. Embolic lymph node metastases as opposed to haematogenous spread are vanishingly rare in true adenoid cystic carcinoma, regardless of site.

Distinction of basaloid squamous carcinoma from adenoid cystic carcinoma has important prognostic and clinical implications. Stage for stage, the behavior and treatment of basaloid squamous carcinoma is similar to that of

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**Table 1** Antibodies

<table>
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<tr>
<th>Antibody</th>
<th>Code No.</th>
<th>Clone</th>
<th>Manufacturer</th>
<th>Dilution</th>
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<td>CK</td>
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<td>MNF116</td>
<td>DAKO</td>
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<tr>
<td>EMA</td>
<td>M613</td>
<td>E29</td>
<td>DAKO</td>
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<tr>
<td>Vim</td>
<td>M0725</td>
<td>V9</td>
<td>DAKO</td>
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<tr>
<td>S100 Protein</td>
<td>Z311</td>
<td>–</td>
<td>DAKO</td>
<td>1:300</td>
</tr>
<tr>
<td>CEA</td>
<td>A0115</td>
<td>–</td>
<td>DAKO</td>
<td>1:400</td>
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</tbody>
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Figure 3 (A) CK positive in squamous and non-squamous areas and (B) CEA positivity in the squamous areas.
conventional squamous cell carcinoma. Surgery with neck node dissection with or without radiotherapy is the usual mode of therapy.\textsuperscript{3}

The purpose of this article is to emphasize the overlapping features seen in basaloid squamous carcinoma and adenoid cystic carcinoma and highlight the role of immunohistochemistry in differentiating the two entities especially when neither keratin nor an overlying in situ squamous carcinoma component is included in the small biopsy.

References