ABSTRACT
Basal cell tumors (BCT) are tumors usually derived from pluripotential stem cell compartments of the basal layer of epidermis and/or oral epithelium. BCTs are infrequent entities in the oral cavity and are not discussed separately in general and oral pathology. A literature review did not reveal any classification of tumors with basaloid morphology. This paper is an attempt to categorize the oral neoplasms with basaloid morphology and discuss their differential diagnoses in detail. A review of the literature was carried out to rule out the frequency of different oral BCTs reported in the literature. Additionally, a simple working classification of oral BCTs has been proposed. We hope that this classification will be helpful for oral and general pathologists and students.

Key words: basal cell tumors, basaloid morphology, oral cavity

INTRODUCTION
Basal cell tumors in the oral cavity are rare. Due to their overlapping histopathological features and admixture of basal cell and squamous cells on histopathological examination, these tumors often produce a diagnostic difficulty for pathologists and oral pathologists. At times, an immunohistochemical examination is required to arrive at a final diagnosis. Some authors also believe that “basaloid” patterns occurring anywhere in the body represent attempts at glandular differentiation. An exhaustive literature review did not reveal any working classification of oral BCTs. A simple working classification of oral BCTs is proposed here (Table 1). In this proposed working classification, oral BCTs can be classified into tumors of the oral epithelium, minor salivary gland tumors and odontogenic tumors.

A. Tumors derived from oral epithelium

1. Intra-oral basal cell carcinoma (IOBCC)
Basal cell carcinoma is the most common adnexal tumor; however its occurrence in the oral cavity is rare and controversial. Clinically, they present as non-healing ulcers. Histopathologically, they exhibit numerous tumor islands composed of basaloid cells in the lamina propria (Figure 1). Tumor islands exhibit a prominent palisading of peripheral basal cells (Figure 2). The diagnosis of IOBCC solely on histopathological grounds, however, is not easy, due to their histological resemblance with peripheral ameloblastoma (PA). The differentiation between IOBCC and PA is of utmost importance since the former is malignant.

Although IOBCC and PA may be distinguished by the presence of reverse polarity in PA, immunohistochemistry is considered as the
2. Oral Basaloid Squamous cell carcinoma (OBSCC)

Basaloid squamous cell carcinoma (BSCC), as defined by the World Health Organization, is an aggressive, high-grade variant of squamous cell carcinoma (SCC), composed of both basaloid and squamous components. BSCCs are common in the oropharynx but rare in the oral cavity. Clinically, they present as indurated masses with central ulceration. Histopathologically, they may resemble the solid variant of adenoid cystic carcinoma (ACC), adenosquamous carcinoma, and small cell neuroendocrine carcinoma (SCNC). BSCC can be differentiated from ACC on the basis of myoepithelial cells and basement membrane-like material (both of which are found in ACC but absent in BSCC). Moreover, the atypia in ACC is less pronounced in comparison to BSCC (Figure 3).

Immunohistochemically, the basement membrane-like material in ACC shows positive expression for laminin and type IV collagen. P63 shows a diffuse positive expression for the tumor cells of BSCC, but is weakly expressed in ACC. Adenosquamous carcinoma shows true ductal acinar differentiation and mucicarmine positivity. BSCC does not show these features and can thus be differentiated from adenosquamous carcinoma. On the other hand, SCNC shows nuclear molding, hyalinization and crushing artifacts on H&E, and immunohistochemically, shows positive expressions for chromogranin and synaptophysin. BSCC is devoid of all of these features. Wain’s criteria is an essential parameter to diagnose BSCC. This criteria include both histologic (peripheral palisading associated with SCC, high nuclear-cytoplasmic ratio, high mitotic index, solid growth pattern) and immunohistochemical features (positive expression for anti-34BE1 and cytokeratin 5/6; negative expression for synaptophysin, and Ber-EP4). Occurrence of BSCC in the oral cavity is infrequent and very few case reports were found in the literature.

A proper diagnosis of Oral BSCC is important in order to plan an appropriate treatment modality, considering its association with poor prognosis.

B. Tumors derived from odontogenic epithelium

1. Basal cell ameloblastoma (BCA)

Ameloblastomas are benign tumors whose importance lies in its potential to grow into enormous size with resulting bone deformity. Basal cell ameloblastoma is a rare variant of solid
multicystic ameloblastoma (SMA) with only 11 cases reported in the literature so far.²⁹ Clinically they are similar to other histopathological variants of SMA.²⁹,³¹ Histopathologically, they exhibit nests of basoid cells that show intense basophilic staining.²⁹ The stellate reticulum-like cells are absent and central cells may be polyhedral.²⁹,³⁰ The nuclear orientation of peripheral cells is different from the other histopathological patterns of ameloblastomas; they are usually cuboidal or columnar and do not show reverse polarity (Figure 4). BCAs show a close resemblance to BCC on histopathology; however a demarcation can be made on immunohistochemical grounds by using Ber-EP4.²⁹,³⁰ The prognosis and biological behavior of BCA is not clear, due to its rarity and very few reported cases.

C. Tumors derived from salivary gland epithelium

1. Basal cell adenoma
Basal cell adenomas (BCA) are rare benign salivary gland tumors, most often originating from the parotid gland.³² BCAs originating from the minor salivary glands are comparatively rare and only 13 cases have been reported in the literature. Histopathologically, they are comprised of isomorphic cells similar to basoid cells with palisading arrangement and distinctive basement membrane-like material (Figure 5). BCAs share a close resemblance with canalicular adenoma and Basal cell adenocarcinomas (BCAC). The trabecular–tubular variant of BCA may be misdiagnosed as canalicular adenoma on low power view, and a proper inspection on high power exhibits the presence of both basal and luminal cells with more collagenized stroma compared to canalicular adenoma.³³,³⁴ BCACs, on the other hand, are not encapsulated and tend to invade the underlying connective tissue stroma.³⁴,³⁵

2. Basal cell adenocarcinoma
Basal cell adenocarcinomas (BCAC) represent the malignant counterpart of basal cell adenoma, believed to arise from pluripotent ductal reserve cells.³⁶–³⁸ Histopathologically, they are characterized by sheets of basoid cells with hyperchromatic nuclei (Figure 6). Some sheets show peripheral palisading. Some tumors show nests invading the connective tissue stroma. It is necessary to differentiate BCAC from other basoid cell tumors because of the differences in prognosis and potential differences in treatment.

3. Adenoid cystic carcinoma
Adenoid cystic carcinoma (ACC) was originally described by Lorain and Laboulbène in 1833. In 1859, Billroth suggested the name cylindroma.³⁹ ACC is a rare tumor, accounting for less than 1% of all head and neck neoplasms and about 4 – 10 % of all salivary gland neoplasms. Histopathologically, ACC shows three different patterns, tubular, cribriform and solid.⁴⁰ The solid pattern of ACC is believed to be the most aggressive form with poor prognosis.³⁹ Solid ACC is characterized histopathologically by tumor nests or islands completely filled with basoid cells without cystic spaces.
CONCLUSION

It can be concluded that oral BCTs are unusual and may represent diagnostic difficulties on microscopic examination because of their overlapping features. This paper is an attempt to discuss the histopathology and differential diagnosis of various oral neoplasms with basaloid morphology. A simple working classification of oral BCTs has been proposed with the aim of helping pathologists distinguish between various oral entities with basaloid features.

STATEMENT OF AUTHORSHIP

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REFERENCES


