

# Basaloid squamous cell carcinoma: Report of two rare cases and review of literature

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## Abstract

Basaloid squamous cell carcinoma (BSCC) is a histologically distinct variant of SCC in the head-and-neck region it occurs most commonly in older men with a history of heavy smoking and alcohol abuse and usually presents as a high stage disease with widespread metastases and hence poor prognosis. BSCC is believed to arise from a totipotential primitive cell in the basal layer of the surface epithelium or from the salivary duct lining epithelium. BSCC is an uncommon tumor with a predilection for the upper aerodigestive tract, is a distinct variant of squamous carcinoma, due to its unique histological features and ominous clinical behavior. In the oral cavity, BSCC has a predilection for the tongue, followed by the floor of the mouth, palate, buccal mucosa, retromolar trigone and gingiva. In the oral cavity, retromolar trigone/gingiva is very rare sites and only a few cases have been reported in the literature. This paper reports an additional two cases of BSCC, one reported in the retromolar region and other reported on the gingiva.

**Keywords:** Basaloid squamous cell carcinoma, gingiva, retromolar trigone, squamous cell carcinoma

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## INTRODUCTION

Cancer is an important public health problem in many parts of the world, and oral cancer is among the 10 most common cancers worldwide. In the oral cavity, squamous cell carcinoma (SCC) is the most prevalent malignant neoplasm. Despite the ready accessibility of the oral cavity for direct examination, these malignancies are often still not detected until a late stage and as a result, the survival rate for oral cancer has remained essentially unchanged over the past three decades.<sup>[1]</sup>

Based on certain morphological features, several histologic variants of SCC have been identified. The following are the most reported variations in the literature

which include basaloid, warty verrucous, papillary, spindle cell, adenosquamous, clear cell, acantholytic and lymphoepithelioma-like type.<sup>[2]</sup>

Basaloid SCC (BSCC) is a rare and aggressive variant of SCC that was first identified as a separate histopathologic entity by Wain.<sup>[3]</sup> BSCC occurs most commonly in older men and had a history of heavy smoking and alcohol abuse and usually presents as a high stage disease with widespread metastases.<sup>[4]</sup>

BSCC is believed to arise from a totipotential primitive cell in the basal layer of the surface epithelium or from the salivary duct lining epithelium.<sup>[5]</sup> It occurs predominantly

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in males in 6<sup>th</sup> and 7<sup>th</sup> decade with a predilection for larynx, hypopharynx, oropharynx, epiglottis.<sup>[1,6,7]</sup> Cadier and others first reported it in the oral cavity.

In the oral cavity, BSCC has a predilection for the tongue (61%) and floor of the mouth (28%) followed by the palate, buccal mucosa but rare in retromolar trigone and gingiva. Till now, retromolar and gingival involvement has been reported in only a few cases.<sup>[4,8]</sup> Here, we present two additional cases of BSCC one report involving retromolar region and another involving gingiva.

## CASE REPORTS

### Case report 1

In 2013, a 60-year-old male patient came to the outpatient department with a chief complaint of a swelling in the lower front tooth region for the past 45 days with no relevant medical history, but with a past dental history of extraction of loosened 41, 42 teeth with subsequent development of swelling at the extracted site which gradually increased to present size. He had a habit of chewing 2–5 packets of tobacco/day for 40 years.

Extraoral examination revealed single palpable left submandibular lymph node which is hard in consistency, fixed and nontender. Intraoral examination revealed erythematous swelling which is 3 cm × 4 cm in size with respect to mandibular anterior region [Figure 1a]. Anteroposteriorly, swelling extended from 31 to 43 and buccolingually from the attached gingiva on the buccal side to the lingual vestibule [Figure 1b]. The swelling was sessile, tender and soft in consistency. No radiological abnormalities were detected.

Incisional biopsy revealed a keratinized stratified squamous epithelium with neoplastic cells infiltrating into the underlying stroma in the form of islands and nests [Figure 2a]. Periphery of the tumor islands showed a palisading pattern. Individual tumor cells revealed hyperchromatic nuclei with scanty cytoplasm [Figure 2b]. Mitotic figures were also seen confirming the diagnosis of a BSCC.

### Case report 2

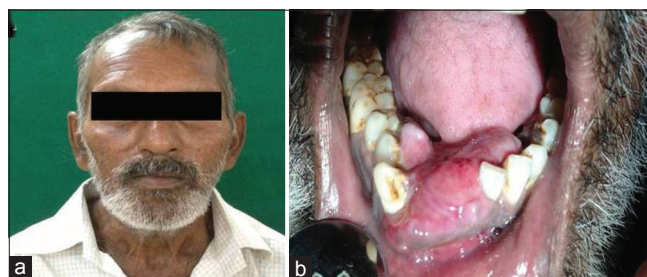
In 2013, a 46 year-old male came to the outpatient department with a chief complaint of pain and swelling in the lower right back tooth region for 2 months. He was known diabetic for 5 years and was under medication. He had a habit of chewing 7–8 packets of gutka/day for 20 years.

Extraoral examination revealed mild facial asymmetry due to swelling over the right cheek region. Swelling was diffuse,

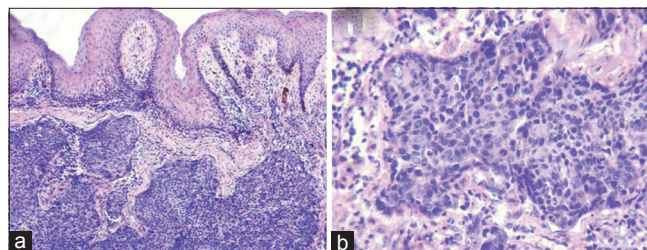
soft to firm in consistency, measuring approximately 2 cm × 1 cm extending anteroposteriorly 2 cm away from the angle of the mouth to 4 cm in front of the posterior border of mandible [Figure 3a]. Single, soft and tender palpable right submandibular lymph node of size 1 cm × 1 cm was noted.

Intra-oral examination revealed a sessile, firm, tender, erythematous 5 cm × 2 cm ulcer extending anteroposteriorly from the distal aspect of lower right second premolar to retromolar pad with a rough surface and everted margins [Figure 3b].

Incisional biopsy revealed stratified squamous epithelium with tumor cells infiltrating into the underlying connective tissue in the form of cords, strands, islands, follicles and nests with peripheral cells showing palisading pattern .



**Figure 1:** (a) Patient presenting erythematous swelling on mandibular anterior region. (b) Intra-oral photograph showing swelling on mandibular anterior gingiva



**Figure 2:** (a) Photomicrograph showing neoplastic cells infiltrating into the underlying stroma in the form of islands and nests (H&E, ×10). (b) Photomicrograph showing palisading pattern of peripheral cells in tumor islands. Individual tumor cells revealed hyperchromatic nuclei with scanty cytoplasm (H&E, ×40)



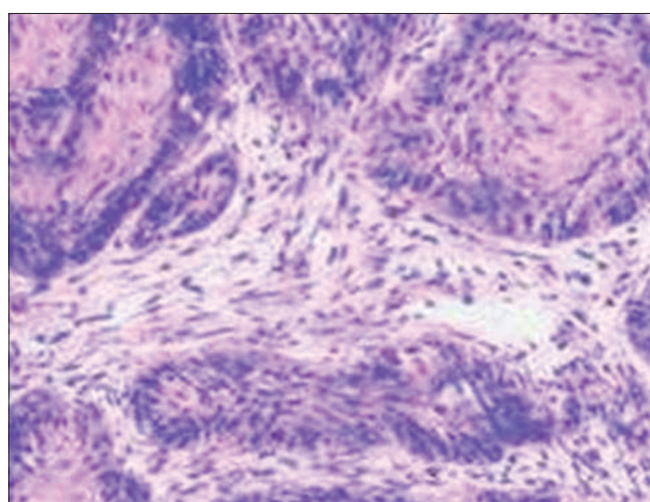
**Figure 3:** (a) Patient presenting mild facial asymmetry on right side of the face. (b) Intra-oral photograph showing erythematous ulcer extending from second premolar to retromolar pad

Individual cells showed hyperchromatic and pleomorphic nucleus [Figure 4]. Keratin pearls between these follicles and vascular invasion were also noted. Based on the presence of above features, a diagnosis of BSCC was established.

## DISCUSSION

BSCC is a rare and malignant tumor that presents in the head-and-neck region, including the oral mucosa, and has been defined as an aggressive and distinct variant of SCC, which is composed of basaloid and squamous components, according to the World Health Organization.<sup>[9]</sup>

BSCC is particularly uncommon in the oral cavity and more so in the gingival and retromolar trigone. The



**Figure 4:** Photomicrograph showing palisading pattern of peripheral cells in tumor islands. Individual cells show hyper chromatic and pleomorphic nucleus (H&E, x40)

clinical features of the BSCC cases that presented in the gingiva and retromolar trigone are reviewed and summarized in Tables 1 and 2 respectively.<sup>[9-12]</sup> Among the cases reported on gingiva two patients were female and eight were male with an age range of 40–79 years (mean age, 60.1 years). The most frequent site of origin was the mandible ( $n = 9$ ) followed by the maxilla ( $n = 2$ ). According to the standard tumor-node-metastasis staging, provided by the AJCC, three patients presented in Stage I, three in Stage II, three in Stage III, and one in Stage IV. All of the patients were treated using surgery, four underwent neck dissections and three received adjuvant radiotherapy. Six patients had survived at the median follow-up time of 56 months. In relation to the cases reported on retromolar trigone, all three cases were in male with two cases in Stage III and one case in Stage IV where one patient died of disease.

Etiology and pathogenesis of basaloid cell carcinoma are similar to conventional squamous carcinoma. Most of the patients have a long history of smoking and alcohol drinking. Smokeless tobacco and other exogenous carcinogens such as occupational, environmental and nutritional factors also play a role in the pathogenesis of BSCC.<sup>[13]</sup> In the present reports, the first case had a history of tobacco chewing for 40 years and the second case had a habit of gutka chewing since 20 years.

The tumors are often large and deeply invasive and may be multifocal or metastatic even at initial presentation. Metastases occur chiefly to regional lymph nodes in about two-thirds of patients but may be widely systemic and involve the lungs, bone, skin and brain.<sup>[5]</sup> Winzenburg *et al.*

**Table 1: Clinicopathological findings of 11 cases of basaloid squamous cell carcinoma that occurred on the gingiva**

First author (reference)	Year	Age/gender	Location of lesion	Stage	Treatment	Final outcome	Followup period, months
Wedenburg <i>et al.</i> <sup>[9]</sup>	1997	55/male	Oral mucosa and maxillary tuberosity	I	Surgery	Alive	5
Abiko <i>et al.</i> <sup>[9]</sup>	1998	79/female	Mandibular gingiva	I	Surgery	Alive	24
Ide <sup>[10]</sup>	2002	Unknown	Mandibular gingiva	-	-	-	-
Yu <i>et al.</i> <sup>[9]</sup>	2008	61/male	Mandibular gingiva	II	Surgery + FND	Alive	120
		56/male		IV	Surgery	Died	180
		65/male		III	Surgery	Died	2.5
Subramania <i>et al.</i> <sup>[9]</sup>	2009	72/female	Mandibular gingiva	III	Surgery + FND + RT	Alive	12
Hirai <i>et al.</i> <sup>[9]</sup>	2009	55/male	Mandibular gingiva	II	Surgery + FND	Alive	79
		65/male		I	Surgery + RT	Alive	60
Xie <sup>[9]</sup>	2010	40/male	Maxillary gingiva	III	Surgery + FND + RT	Alive	25
Present case	2013	60/male	Mandibular anterior gingiva	II	Surgery	Alive	24

FND: Functional neck dissection, RT: Radiotherapy

**Table 2: Clinicopathological findings of three cases of basaloid squamous cell carcinoma that occurred on the retromolar trigone**

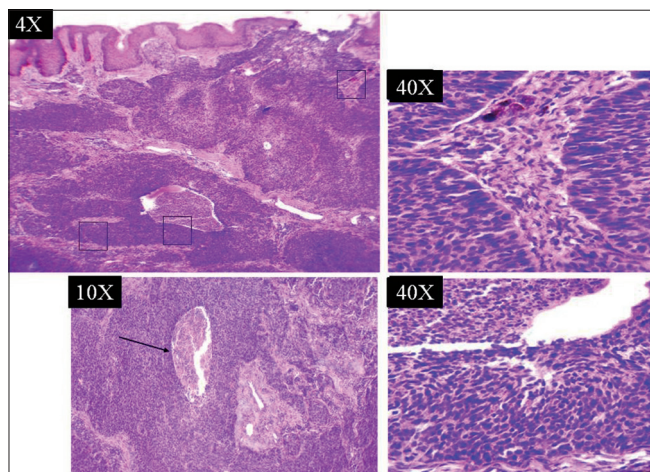
First author (reference)	Year	Age/gender	Location of lesion	Stage	Treatment	Final outcome	Followup period, months
Campos <sup>[11]</sup>	2009	59/male	Retromolar trigone	III	Surgery + RT	Died	8
Rachel <sup>[12]</sup>	2011	65/male	Retromolar trigone	IV	Surgery + FND + RT	Alive	3
Present case	2013	46/male	Retromolar trigone	III	Surgery	Alive	24

FND: Functional neck dissection, RT: Radiotherapy

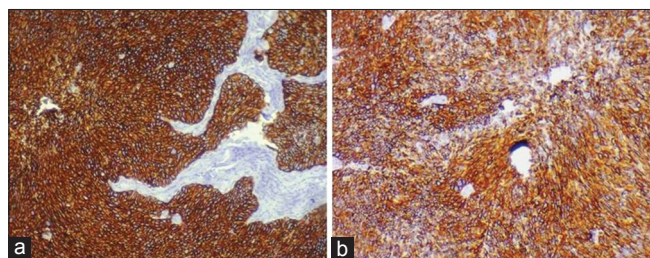
first identified that distant metastases occurred in 52% of patients with BSCC. Xie *et al.* showed that patients with SCC were associated with notably higher survival rates when compared with patients with BSCC.<sup>[9]</sup>

Macroscopically, these tumors are usually firm to hard with associated central necrosis, occurring as exophytic to nodular masses, measuring up to 6 cm in greatest dimension.<sup>[6]</sup>

Histologically, BSCC shows unique bimorphic patterns: basaloid and squamous components with predominant basaloid components.<sup>[4]</sup> BSCC was diagnosed based on four principal histologic features: (a) solid groups of cells in a lobular configuration, closely apposed to the surface mucosa; (b) small, crowded cells with scant cytoplasm; (c) dark, hyperchromatic nuclei without nucleoli; and (d) small, cystic spaces containing mucin-like material.<sup>[14]</sup> The pathological features of BSCC (nuclear pleomorphism, hyperchromasia, mitotic activity and necrosis), altogether indicate a high-grade malignancy.<sup>[5]</sup> In the present reports, both cases revealed all the features indicating high-grademalignancy [Figures 5 and 6].



**Figure 5:** Case 1 H&E images: Photomicrograph showing neoplastic cells infiltrating into the underlying stroma in the form of islands and sheets (H&E,  $\times 4$ ); Inlets in  $\times 4$  image- inlets reveal basal palisading pattern ( $\times 40$ ), comedo necrosis ( $\times 10$ ) and predominant basaloid cells over squamous cells ( $\times 40$ )

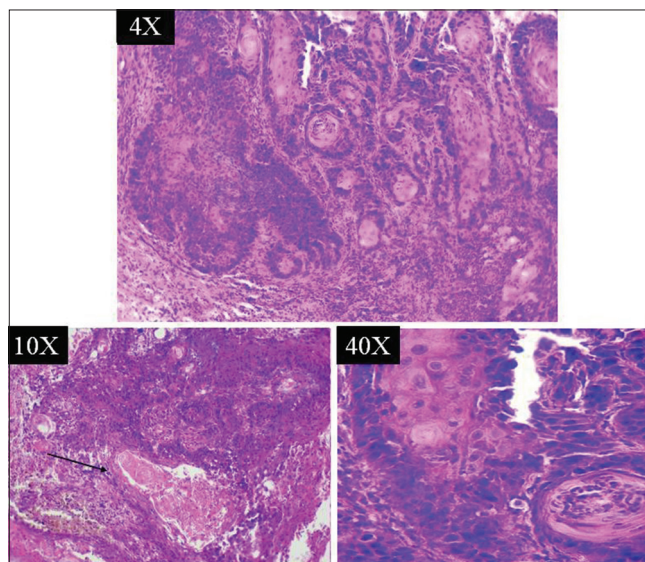


**Figure 7:** (a and b) Photomicrograph of immunohistochemical images of 34  $\beta$ E12 showing positivity for the tumor ( $\times 10$  and  $\times 40$ ),

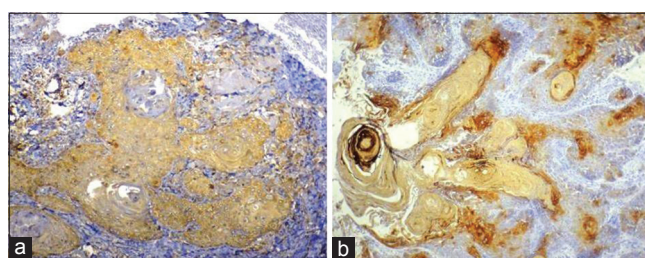
By immunohistochemistry, BSCC expresses cytokeratins, epithelial membrane antigen, Cam 5.2, pankeratin AE/AE3 and squamous epithelial marker 34  $\beta$ E12 which is the most useful marker for this tumor.<sup>[15]</sup> Present cases were immunohistochemically stained with 34  $\beta$ E12 and CK17 which revealed positivity for the tumor [Figures 7 and 8].

BSCC should be histologically differentiated from solid adenoid cystic carcinoma, adenosquamous carcinoma, mucoepidermoid carcinoma, neuroendocrine carcinoma, basal cell and polymorphous low-grade adenocarcinoma, small cell undifferentiated carcinoma, conventional SCC, basal cell carcinoma, spindle cell carcinoma and adenoid SCC.<sup>[4-6,14]</sup>

The clinical course and prognosis of BSCC have been considered worse than for conventional SCC.<sup>[1]</sup> BSCC requires aggressive multimodality therapy, including radical surgical excision, neck dissection, radiotherapy and often



**Figure 6:** Case 2 H&E images: Photomicrograph showing neoplastic cells infiltrating into the underlying stroma in the form of islands and nests. (H&E,  $\times 4$ ); Inlets in  $\times 4$  image- inlets reveal basal palisading pattern ( $\times 40$ ) & comedo necrosis ( $\times 10$ ) and predominant basaloid cells over squamous cells ( $\times 40$ )



**Figure 8:** (a and b) Photomicrograph of immunohistochemical images of CK17 showing positivity for the tumor ( $\times 10$  and  $\times 40$ )

chemotherapy, especially for metastatic disease. The overall mortality rate is high (60% die of disease).<sup>[6]</sup> Although chemotherapy is recommended by certain authors due to the high incidence of distant metastasis and the relatively poor prognosis, a standard chemotherapy regimen for BSCC has not yet been established. Furthermore, investigation of a greater number of patients is required to determine the efficacy of chemotherapy for BSCC of the head and neck. It is advocated that immunotherapy elicited an improved treatment effect when compared with radiotherapy alone and resulted in a reduced mortality rate.<sup>[9]</sup>

## CONCLUSION

BSCC is an uncommon, histologically distinct, highly aggressive malignant tumor that is difficult to diagnose before surgery. The clinical and biological course of BSCC is similar to that of SCC. Multimodal therapy offers the best chance for local and systemic control.

## Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient have given his consent for his images and other clinical information to be reported in the journal. The patients understand that name and initials will not be published and due efforts will be made to conceal identity, but anonymity cannot be guaranteed.

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Nil.

## Conflicts of interest

There are no conflicts of interest.

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