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

Kalavani Peddapelli, Guttikonda Venkateswara Rao, Taneeru Sravya, Sravya Ravipati
Department of Oral Pathology and Microbiology, Mamata Dental College, Khammam, Telangana, India

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 the other reported on the gingiva.

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

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.[1]

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.[2]

Basaloid SCC (BSCC) is a rare and aggressive variant of SCC that was first identified as a separate histopathologic entity by Wain.[3] 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.[4]

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.[5] It occurs predominantly...
in males in 6\textsuperscript{th} and 7\textsuperscript{th} decade with a predilection for larynx, hypopharynx, oropharynx, epiglottis.\cite{1,6,7} 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.\cite{4,8} 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.
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.\(^9\) BSCC is particularly uncommon in the oral cavity and more so in the gingival and retromolar trigone. The clinical features of the BSCC cases that presented in the gingiva and retromolar trigone are reviewed and summarized in Tables 1 and 2 respectively.\(^9,10\) 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.\(^11\) 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.\(^12\) 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 et al.\(^9\)   | 1997 | 55/male    | Oral mucosa and maxillary tuberosity | I     | Surgery   | Alive        | 5                       |
| Abiko et al.\(^9\)       | 1998 | 79/female  | Mandibular gingiva  | I     | Surgery   | Alive        | 24                      |
| Ide\(^9\)                | 2002 | Unknown    | Mandibular gingiva  | I     | Surgery   | Alive        | 24                      |
| Yu et al.\(^9\)          | 2008 | 61/male    | Mandibular gingiva  | II    | Surgery + FND | Alive        | 12                      |
|                          |      | 56/male    |                    |       | FND       |               |                         |
|                          |      | 65/male    |                    |       |           |               |                         |
| Subramania et al.\(^9\)  | 2009 | 72/female  | Mandibular gingiva  | III   | Surgery + FND | Alive        | 12                      |
|                          |      | 65/male    | gingiva            |       | FND       | Alive        | 79                      |
| Hirai et al.\(^9\)       | 2009 | 55/male    | Mandibular         | II    | Surgery + FND | Alive        | 60                      |
|                          |      |             | gingiva            |       | FND       | Alive        |                         |
|                          |      | 65/male    | gingiva            | I     | Surgery + RT | Alive        |                         |
| Subramania et al.\(^9\)  | 2010 | 40/male    | Maxillary gingiva  | III   | Surgery + FND + RT | Alive        | 25                      |
| Xie\(^9\)                | 2010 | 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\(^9\)             | 2009 | 59/male    | Retromolar trigone | III   | Surgery + RT | Died          | 8                       |
| Rachel\(^9\)             | 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.[9]

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.[6]

Histologically, BSCC shows unique bimorphic patterns: basaloid and squamous components with predominant basaloid components.[6] 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.[14] The pathological features of BSCC (nuclear pleomorphism, hyperchromasia, mitotic activity and necrosis), altogether indicate a high-grade malignancy.[8] In the present reports, both cases revealed all the features indicating high-grade malignancy [Figures 5 and 6].

By immunohistochemistry, BSCC expresses cytokeratins, epithelial membrane antigen, Cam 5.2, pankeratin AE/AE3 and squamous epithelial marker 34 βE12 which is the most useful marker for this tumor.[13] Present cases were immunohistochemically stained with 34 βE12 and CK17 which revealed positivity for the tumor [Figures 7 and 8].

BSCC should be histologically differentiated from solid adenoid cystic carcinoma, adenosquamous carcinoma, mucopidermoid 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.[4-6,14]

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

**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, ×4); Inlets in ×4 image- inlets reveal basal palisading pattern (×40), comedo necrosis (×10) and predominant basaloid cells over squamous cells (×40)

**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, ×4); Inlets in ×4 image- inlets reveal basal palisading pattern (×40) & comedo necrosis (×10) and predominant basaloid cells over squamous cells (×40)

**Figure 7:** (a and b) Photomicrograph of immunohistochemical images of 34 βE12 showing positivity for the tumor (×10 and ×40),

**Figure 8:** (a and b) Photomicrograph of immunohistochemical images of CK17 showing positivity for the tumor (×10 and ×40)
chemotherapy, especially for metastatic disease. The overall mortality rate is high (60% die of disease).[6] 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.[6]

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.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

REFERENCES

1. Pereira MC, Oliveira DT, Landman G, Kowalski LP. Histologic subtypes of oral squamous cell carcinoma: Prognostic relevance. J Can Dent Assoc 2007;73:339-44.
2. Neville BW, Day TA. Oral cancer and precancerous lesions. CA Cancer J Clin 2002;52:195-215.
3. Satish BN, Kumar P. Basaloid squamous cell carcinoma – A case report. Int J Dent Clin 2010;2:31-3.
4. Tantradi P, Nayak R. Basaloid squamous cell carcinoma of the mandibular alveolar ridge and floor of the mouth – A case report. J Int Oral Health 2010;2:62-4.
5. Paulino AF, Singh B, Shah JP, Huvos AG. Basaloid squamous cell carcinoma of the head and neck. Laryngoscope 2000;110:1479-82.
6. Thompson LD. Squamous cell carcinoma variants of the head and neck. Curr Diagn Pathol 2003;9:384-96.
7. Vasudev P, Boutross-Tadross O, Radhi J. Basaloid squamous cell carcinoma: Two case reports. Cases J 2009;2:9351.
8. de Sampaio Góes FC, Oliveira DT, Dorta RG, Nishimoto IN, Landman G, Kowalski LP, et al. Prognoses of oral basaloid squamous cell carcinoma and squamous cell carcinoma: A comparison. Arch Otolaryngol Head Neck Surg 2004;130:83-6.
9. Xie S, Bredell M, Yang H, Shen S, Yang H. Basaloid squamous cell carcinoma of the maxillary gingiva: A case report and review of the literature. Oncol Lett 2014;8:1287-90.
10. Ide F, Shimoyama T, Horie N, Kusama K. Basaloid squamous cell carcinoma of the oral mucosa: A new case and review of 45 cases in the literature. Oral Oncol 2002;38:120-4.
11. Campos MS, Modolo F, de Oliveira JS, Pinto-Júnior DS, de Sousa SC. Atypical presentation of oral basaloid squamous cell carcinoma. J Contemp Dent Pract 2009;10:98-104.
12. Rachel JR, Kumar NS, Jain NK. Basaloid squamous cell carcinoma of retromolar trigone: A case report with review of literature. J Oral Maxillofac Pathol 2011;15:192-6.
13. Radhi J. Basaloid Squamous Cell Carcinoma, Squamous Cell Carcinoma. Prof. Xiaoming Li Ed. China: InTech publication; 2012.
14. Shinno Y, Nagatsuka H, Siar C, Tsujiwa H, Tamamura R, Gunduz M, et al. Basaloid squamous cell carcinoma of the tongue in a Japanese male patient: A case report. Oral Oncol Extra 2005;41:65-9.
15. Ereño C, Gaafar A, Garmendia M, Etxebarria C, Bilbao FJ, López JJ, et al. Basaloid squamous cell carcinoma of the head and neck: A clinicopathological and follow-up study of 40 cases and review of the literature. Head Neck Pathol 2008;2:83-91.