CASE REPORT

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A rare case of basaloid squamous cell carcinoma of the maxilla

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Abstract

Basaloid squamous cell carcinoma (BSCC) is a rare and aggressive variant of squamous cell carcinoma (SCC) that occurs preferentially in the upper aerodigestive tract. Since the first description by Wain SL *et al.*, in 1986, only 21 cases with BSCC in the nasal cavity or in the paranasal cavity have been reported in the English literature. We present here a case of BSCC arising in a paranasal sinus. The case was a 51-year-old male patient with four months history of right cheek swelling and unilateral nasal obstruction, who received operation and postoperative radiotherapy. Clinical, surgical and pathological findings in this case, including immunohistochemistry is presented along with brief discussion of literature.

Keywords: basaloid squamous cell carcinoma, squamous cell carcinoma, immunohistochemistry.

Introduction

Wain SL *et al.* [1] first proposed in 1986 that basaloid squamous cell carcinoma (BSCC) was a distinct variant of squamous cell carcinoma (SCC).

Basaloid squamous cell carcinoma is a high-grade and aggressive variant of squamous cell carcinoma that is most commonly found in the upper aerodigestive tract [1–14].

In 1991, the *World Health Organization* included this tumor in the revised classification for the upper respiratory tract and ear [15].

The most common sites of occurrence in the upper aerodigestive tract are the oral cavity, the larynx, the hypopharynx, the pyriform sinus, the tonsils and the base of tongue. Other less frequently affected sites are nose, paranasal sinus, gingiva, external ear, submandibular region, esophagus, lung, anus, vulva, vagina and the uterine cervix [2, 16].

So far, only 21 cases of BSCC of the nose and paranasal sinuses have been reported in the English literature [2, 7–19].

BSCC is characterized by nesting, lobular and trabecular arrangement of small crowded cells with scant cytoplasm, and hyperchromatic nuclei. The lobules of malignant basaloid cells often display peripheral nuclear palisading, high mitotic activity, comedo necrosis, and small cystic spaces filled with mucinous material, making these tumors difficult to differentiate from adenoid cystic carcinoma or from small-cell undifferentiated carcinoma.

We report an additional case of BSCC of the maxillary sinus and we review the clinical features of BSCC.

Patient, Methods and Results

We present a rare case of tumor investigated and operated in our department. A 51-year-old male patient was admitted in our clinic with four months history of right cheek swelling (Figure 1) and unilateral nasal obstruction.

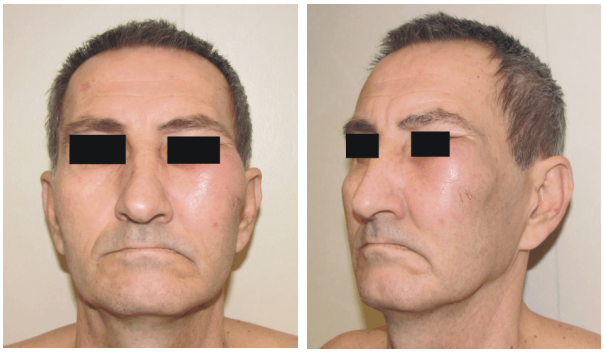

Figure 1 – ***A 51-year-old male patient with four months history of right cheek swelling and unilateral nasal obstruction.***

Clinical examination revealed a mass in the left nasal cavity and paranasal sinus.

Past medical history was unremarkable. There was no significant history of smoking or alcohol consumption.

There was no evidence of either lymphatic or distant metastasis at the time of diagnosis.

Magnetic resonance imaging (MRI) demonstrated a tumor involving the right maxillary sinus (Figure 2).

The patient was treated by wider surgical excision of the mass and reconstruction with a rectus abdominis free flap (Figure 3), followed by radiotherapy.

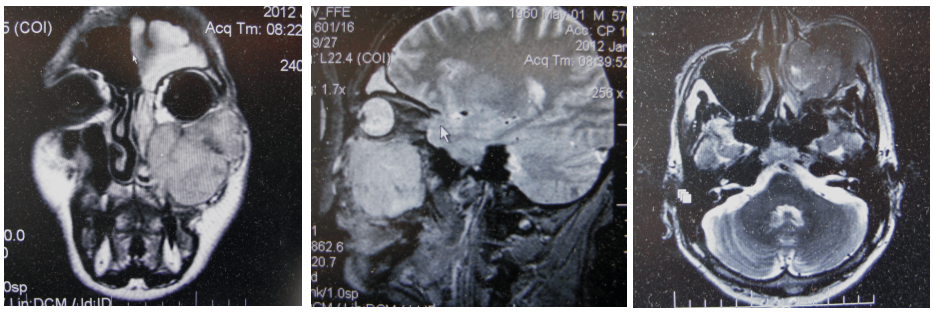

Figure 2 – ***MRI of the left maxillary sinus showing that the tumor invaded the nasal cavity and the maxillary sinus.***

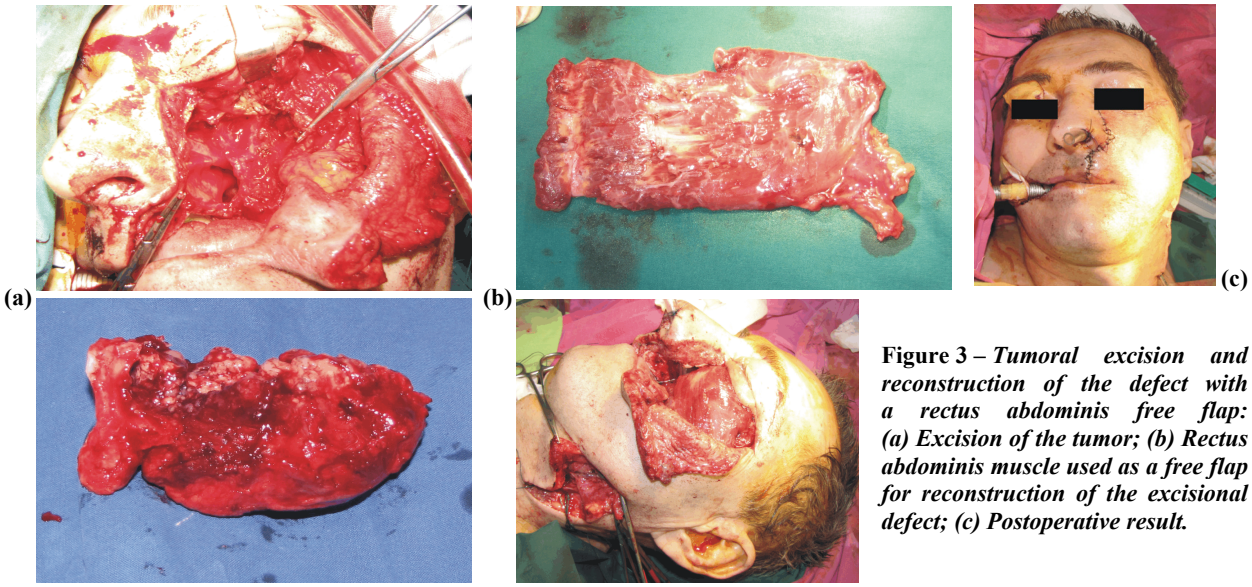

Figure 3 – ***Tumoral excision and reconstruction of the defect with a rectus abdominis free flap: (a) Excision of the tumor; (b) Rectus abdominis muscle used as a free flap for reconstruction of the excisional defect; (c) Postoperative result.***

For the investigation of the tissue material, we used classical histopathological method and for the histopathological evaluation, the slides were stained with usual coloration, Hematoxylin–Eosin (HE). Microscopic examination showed that the nests of tumor cells were arranged in cords, trabeculae, islands and lobules that occasionally showed pseudoglandular formation (Figure 4). There were two cellular populations. The predominant cell population was that of basaloid cell type, with lesser cytoplasm, more congested, with presence of peripheral palisades, which forms a central necrosis of comedo type and zones of abrupt appearance of cellular components of squamous type with more cytoplasm, pale, eosinophils. Cells at the edges of the nests showed nuclear palisading. There were some extended areas of confluent necrosis (Figure 4a), peritumoral desmoplasia (Figure 4b), and tumor islets that infiltrate the striated deep muscular tissue (Figure 4c). Numerous atypical mitosis and perivascular tumoral infiltration were present (Figure 4c).

For analysis of immunohistochemistry, the histopathological slides were deparaffined, rehydrated with pH 7.4 phosphate buffered saline (PBS). Immunohistochemistry staining was realized with Dako EnVision™+ Dual Link System-HRP (Dako, Carpinteria, USA) according to the instructions of the manufacturer and then the slides were counterstained with Mayer's Hematoxylin. The case was tested for immunohistochemistry with antibodies for CK 34βE12, p63, CK7, vimentin E, Ki67. Details about the primary antibodies used are illustrated in the Table 1.

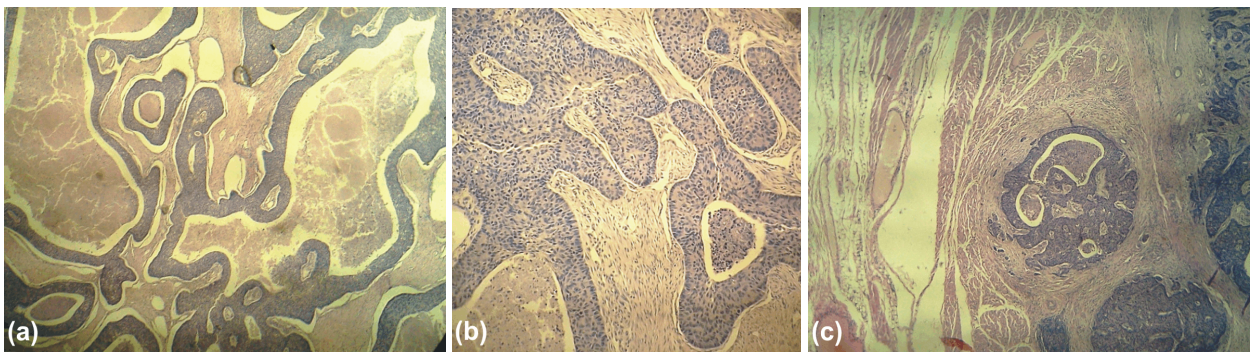

Figure 4 – ***Microscopic examination showed that the nests of tumor cells were arranged in cords, trabeculae, islands and lobules that occasionally showed pseudoglandular formation: (a) Some extended areas of confluent necrosis (HE stain, ob. ×10); (b) Peritumoral desmoplasia (HE stain, ob. ×40); (c) Tumor islets that infiltrate the striated deep muscular tissue, numerous atypical mitosis and perivascular tumoral infiltration were present (HE stain, ob. ×10).***

Table 1 – ***The antibodies used to analyze the immunohistochemical profile of the tumor***

Antibody	Company	Dilution	Clone	Positive control
34βE12	DakoCytomation, Glostrup, Denmark	1:50	34βE12	Epidermis
P63	Santa Cruz Biotechnology, Inc., USA	1:75	BC4A4	Basal cell epidermis
Ki67	DakoCytomation, Glostrup, Denmark	1:75	MIB1	Basal layer epidermis
CK7	DakoCytomation, Glostrup, Denmark	1:50	OV-TL 12/30	Glandular epithelium
Vimentin	DakoCytomation, Glostrup, Denmark	1:50	V9	Conjunctive tissue

The immunoprofile of these tumors showed diffuse positive staining for squamous epithelial marker 34βE12 (Figure 5a), CK7 (Figure 5, b and c), Ki67 (Figure 5d), p63 (Figure 5e). The tumoral cells were vimentin negative, but peritumoral stroma was vimentin positive (Figure 5f). Based on the histologic and immunohistochemical findings, the tumor was diagnosed as BSCC.

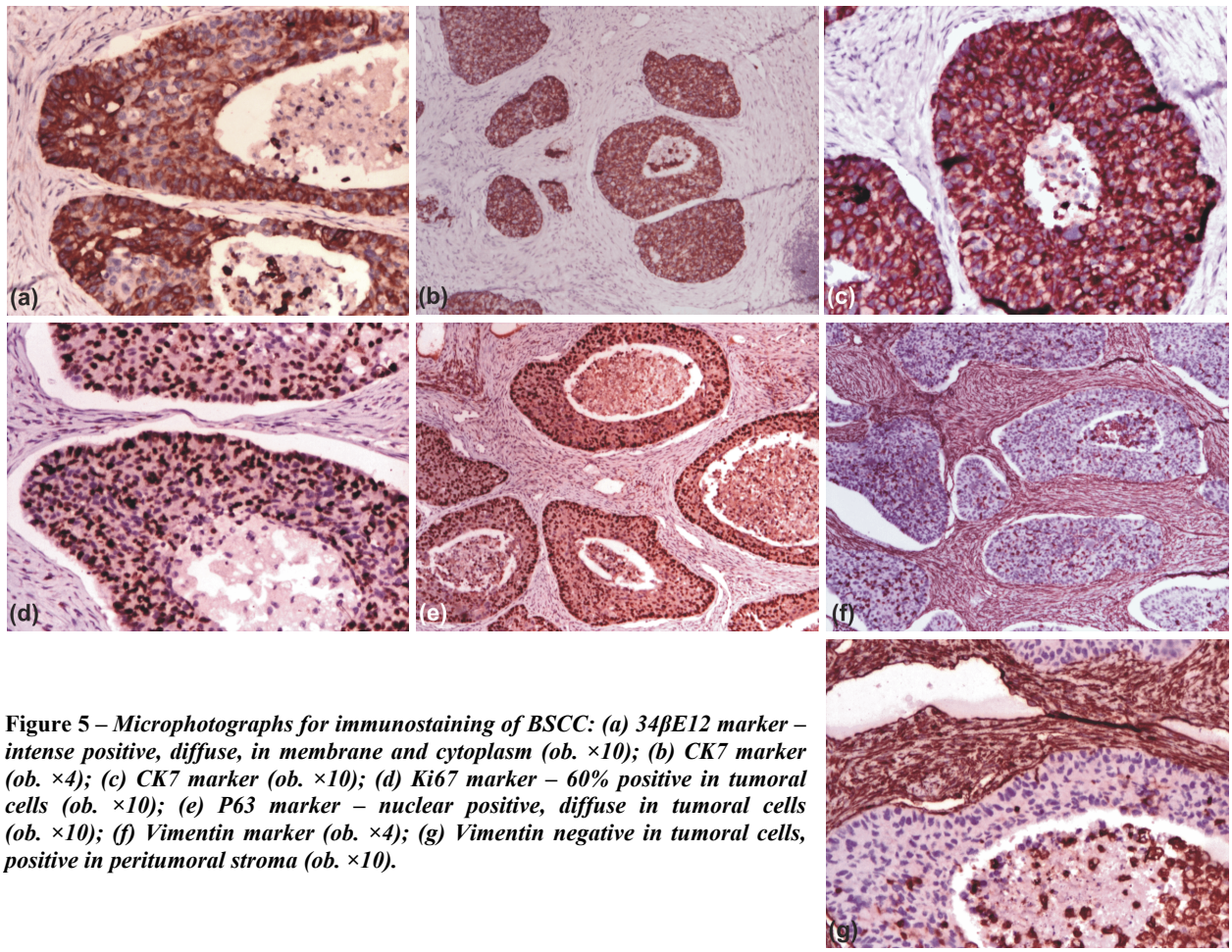

Figure 5 – ***Microphotographs for immunostaining of BSCC: (a) 34βE12 marker – intense positive, diffuse, in membrane and cytoplasm (ob. ×10); (b) CK7 marker (ob. ×4); (c) CK7 marker (ob. ×10); (d) Ki67 marker – 60% positive in tumoral cells (ob. ×10); (e) P63 marker – nuclear positive, diffuse in tumoral cells (ob. ×10); (f) Vimentin marker (ob. ×4); (g) Vimentin negative in tumoral cells, positive in peritumoral stroma (ob. ×10).***

Discussion

BSCC is a rare and a high-grade histological variant of squamous cell carcinoma, which occurs predominantly in men in their 60 and 70s. There have been some reports of it being associated with tobacco and alcohol abuse [2, 10, 20, 21]. It arises in a variety of anatomic sites, most frequently in the upper aero-digestive tract with strong predilection for the base of the tongue, supraglottic larynx and hypopharynx [1–14], but is also found in the anus, thymus and uterine cervix.

Since their report, BSCCs of other head and neck regions [2], such as oral cavity, the palate, floor of the mouth, nasopharynx, and oropharynx have been reported. Although this tumor type is most commonly found in the head and neck region, BSCC in the nasal cavity or in the paranasal sinuses is rare, with only 18 reported cases [2]. The case reported here is consistent with previous reports. Though the chief complaint in our case was cheek swelling, the most commonly reported clinical symptom of nasal or paranasal BSCC is unilateral nasal obstruction [18].

It has been reported that BSCC often shows an aggressive biologic behavior characterized by a high incidence of cervical lymph node metastasis and distant spread. In two reviews of the literature about BSCC in the head and neck, the incidences of neck node and distant metastasis are reported to be 64% and 44%, respectively, with 38% mortality at 17 months median survival [2, 12]. Results of a case-control study by Soriano E *et al.* [20] found a six times higher risk of distant metastasis compared to usual type of SCC.

Treatment of choice is complete surgical excision supplemented by radiotherapy/adjuvant chemotherapy. Although chemotherapy was suggested by some authors because of the high incidence of distant metastasis and the relatively poor prognosis [4, 12, 18], a standard

chemotherapy regimen for BSCC has not been established. A greater number of patients must be studied to determine the effectiveness of chemotherapy for BSCC of the head and neck.

Gross examination of BSCC often reveals firm, exophytic, polypoid, and often centrally ulcerated masses.

Microscopically, BSCC is composed of a basaloid pattern, which consists of small, crowded cells with hyperchromatic nuclei, scant cytoplasm. The lobulus of basaliod cells often display peripheral nuclear palisading, comedonecrosis, small cystic spaces containing material resembling mucin and high mitotic activity [2]. Necrosis is typical, taking the form of single cell necrosis and central comedo necrosis. The second major characteristic of the BSCC is the presence of squamous component that includes at least one of following features: adjacent foci of conventional squamous cell carcinoma, dysplasia or carcinoma *in situ* of the overlying mucosa [22].

In cases, which are difficult to diagnose, immunohistochemical studies are reported to be useful for differential diagnosis. Morice WG and Ferreiro JA observed more than 95% of BSCC cases were immunoreactive with anti-high-molecular-weight cytokeratin antibody 34βE12, whereas no reactivity was seen in cases of SCC [23]. Our case showed immunoreactivity with cytokeratin antibody 34βE12.

The differential diagnosis of BSCC includes adenoid cystic carcinoma (ACC), small-cell undifferentiated carcinoma, basal cell adenocarcinoma (BCAC), adenosquamous carcinoma, and basosquamous carcinoma [16, 24, 25]. Madur BP and Jambhekar NA [26] found that BSCC were negative for vimentin and S100. Emanuel P *et al.* [27] found that the p63 staining pattern of BSCC differed strikingly from the staining pattern in ACC. BSCC consistently displayed diffuse p63 positively, with staining of nearly 100% of tumor cells. In contrast, ACC displayed a consistently compartmentalized pattern within tumor nests.

Conclusions

We report an additional case of BSCC of the maxillary sinus. Surgery with radiotherapy is currently the treatment of choice. Considering the high incidence of distant metastasis, further studies will be necessary to determine the effectiveness of chemotherapy.

Acknowledgments

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