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High-grade transformation of acinic cell carcinoma of the parotid gland: a rare case

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Background

Acinic cell carcinoma (ACC) constitutes about 10% of all primary salivary malignancies (*figure 1*); it was first described as "benign adenoma" in 1890 by Godwin et al., in 1953 Buxton et al. recognized it as a malignant tumor and recently WHO has classified as a "malignant carcinoma", despite its generally favorable progrosis [1-2]. It is the third most frequent epithelial neoplasm of the salivary glands in adults and the second in children, with predilection for 50–60 years female and for parotid gland [2-3-4]. High-grade transformation (HGT) is an unusual event with rapid growth, pain, facial paralysis and fixation to surrounding tissues.

Case presentation

In January 2023 a 60-years-old woman presented with a suspected mass of 25x23x22 mm in the right parotid. Hematoxylin and eosin-stained sections revealed a neoplasm with solid patterns of growth, composed predominantly of pleomorphic cells having large nuclei and prominent nucleoli. Extensive necrosis, vascular and perineural invasion were seen as well as brisk mitotic activity (22/10 HPF) *(figures 2b-2c-2d-2e-2f-2g).* A minor microcystic growth pattern was present, in which bland uniform cells with eosinophilic cytoplasm represented the main tumor cell population *(figure 2a).* Immunohistochemistry showed positivity for CK AE1-AE3, CK 8-18, DOG1, SOX10, Cyclin D1, HER2 (c-erbB2), negativity for p63, S-100, mammaglobin, CK 7, CK 20, CK 5/6, CK19, estrogenic receptor, androgen receptor and focal positivity for C-kit (CD117). KI67 was approximately 60% (*figures 2h, 2i, 2l, 2m, 2n, 2o, 2p, 2q).* Diagnosis of high-grade transforming acinic cell carcinoma (HGT-ACC) was made.

Discussion

High-grade transformation (HGT) or dedifferentiation has been described in several salivary gland neoplasms, including acinic cell carcinoma [5].
In HGT- ACC, along with the typical low-grade, a portion of high-grade morphology is described; the latter is characterized by solid nests of anaplastic cells with large vesicular pleomorphic nuclei, prominent nucleoli and abundant cytoplasm, increased mitotic index, extensive necrosis and frequent mitosis. Vascular and perineural invasion are common [2-5-6-7].
Immunohistochemically the expression of b-catenin and cyclin D1 is generally stronger in HGT-ACC than in ACC, while generally HER-2, androgen receptor and myoepithelial markers are negative in high-grade components; P53 is not a reliable marker of HGT-ACC [5].
The exact etiopathogenesis of HGT is not yet clear [7].
HGT-ACC is a rare neoplasia with poor prognosis, an high-risk of recurrence, cervical lymph node metastasis and a survival rate of 2.9 years in about 79% of patients.
There are no standard guidelines for HGT-ACC treatment but, because of its aggressive clinical course, a predilection for regional lymph nodes and distant metastases, a total parotidectomy and lymph node dissection is recommended [7].

Conclusion

In this case report, we present a middle-aged woman with an unusual high-grade variant of acinic cell carcinoma. Moreover, the present case is peculiar because of the uncommon presence of HER2 expression that is typical of Salivary Duct Carcinoma. However, the focal presence of acinic differentiation, the lack of apocrine features and the DOG1 positivity, support the diagnosis of HGT-ACC. Despite ACC generally has a good prognosis, HGT-ACC has unfavorable prognosis, unclear pathogenesis and the current therapeutic guidelines are not clear. Therefore, the determination of more precise histological, molecular and therapeutic criteria is crucial.

Figures

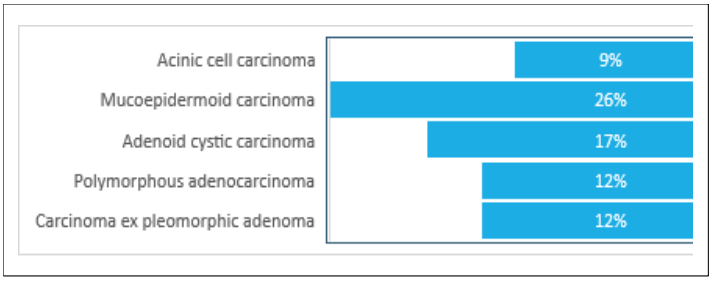
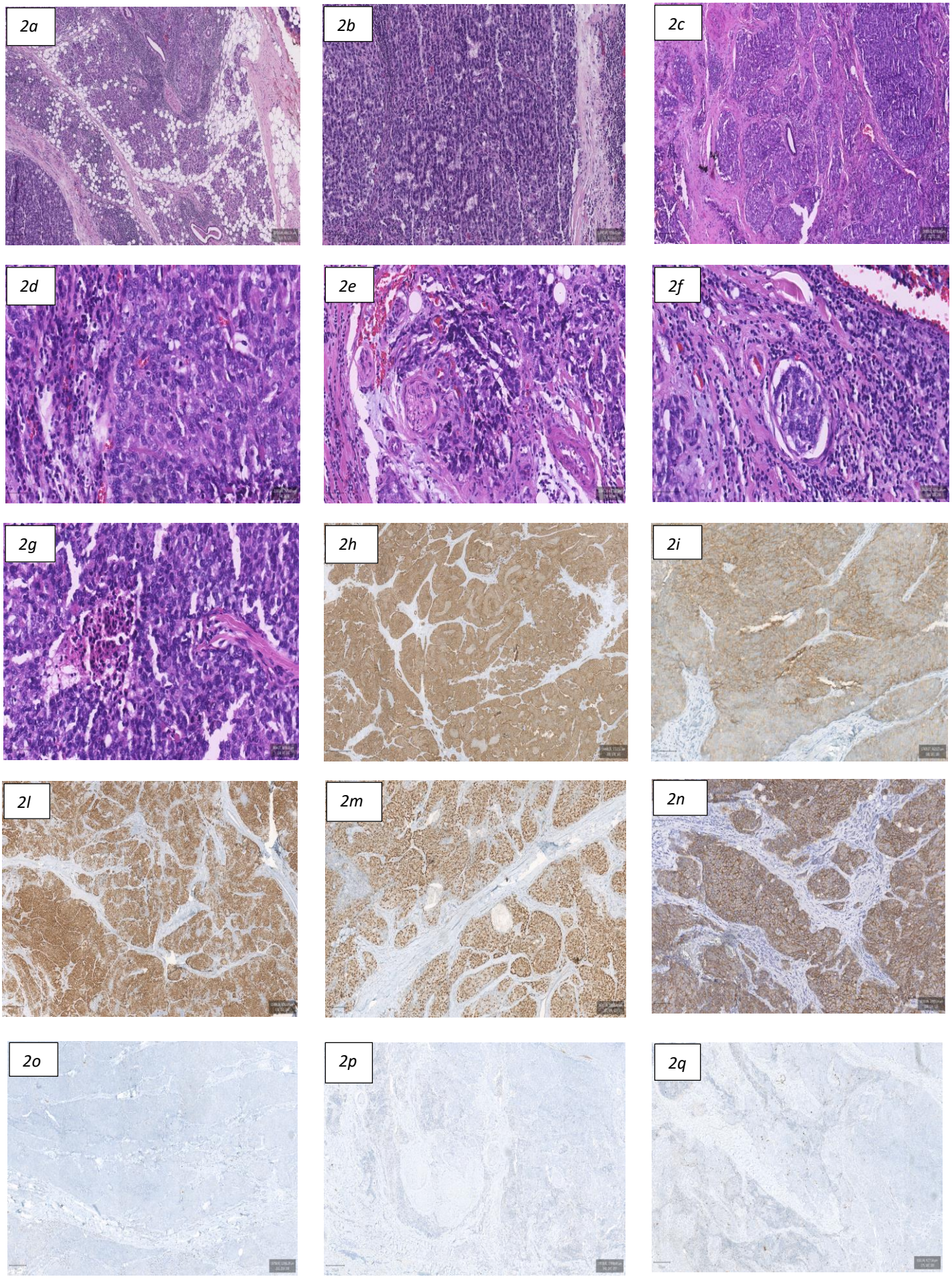


Figure 1: Major malignant salivary gland tumours



The tumour has a biphasic histology and is composed by an high-grade carcinoma with solid pattern of growth (right red arrow) and a conventional acinic cell carcinoma (left yellow arrow) with interposed regular salivary gland tissue (green arrow) (2a) (H&E, 5x).Low grade carcinoma with acinic pattern of growth (2b) (H&E, 10x). High-grade carcinoma exhibiting solid patterns of growth (2c) (H&E, 5x) composed by large cells with pleomorphic nuclei, prominent nucleoli and several mitoses (2d) (H&E, 30x). Perineural invasion (2e) (H&E, 20x), vascular invasion (2f) (H&E, 30x) and necrosis (2g) (H&E, 30x) are present. The immunohistochemical study shows positivity for CK AE1-AE3 *(2h), DOG1 (2i), SOX10 (2l), cyclin D1 (2m), HER2 (2n), negativity for p63 (2o, S100 (2p) and mammaglobin (2q).*

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