CASE REPORT

Salivary duct carcinoma of parotid gland

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DOI: 10.4103/0973-029X.57676

ABSTRACT

A 40-year old male presented with rapidly growing swelling in the right parotid region. Based on the fine needle aspiration cytology report of adenocarcinoma not otherwise specified, superficial parotidectomy was performed, which showed the features of salivary duct carcinoma by histopathological examination. The smears were reviewed to identify the potential pitfalls in the cytological diagnosis of salivary duct carcinoma.

Key words: Fine needle aspiration cytology, parotid malignancy, salivary duct carcinoma

INTRODUCTION

Salivary duct carcinoma is a distinctive primary neoplasm of the major salivary gland first described by Kleinsasser *et al.* in 1968.[1] The term was selected because of its resemblance to ductal carcinoma of the breast. It is characterized by an aggressive behavior, early metastasis, local recurrence and significant mortality. Nearly 85% of the cases occur in the parotid gland followed by the submandibular gland. Rarely it is observed in the hard palate. The tumor has predilection for older men in the sixth to seventh decades of life. A number of patients experience facial nerve palsy and / or pain, and have cervical lymphadenopathy at presentation.[1] Familiarity with this entity is necessary to avoid false interpretation. On account of its apocrine features and a high nuclear grade, several primary and metastatic neoplasms enter the differential diagnosis, particularly on fine needle aspiration cytology.[2-5]

CASE REPORT

A 40-year-old male presented with a painless swelling below the right ear lobule, since five years, with a history of a rapid increase in the size of the swelling since three months.

On examination, there was a right parotid swelling of 7 × 4 cm, which was hard in consistency. The overlying skin was stretched and shiny. There was no evidence of either facial nerve involvement or regional lymphadenopathy. Chest radiograph was normal. Clinically, there was no evidence to suggest prostatic or breast carcinoma. The patient underwent superficial parotidectomy based on the FNAC report of Adenocarcinoma [not otherwise specified] [Figures 1 and 2].

Pathological findings

Grossly the specimen consisted of a roughly ovoid, nodular mass of 7 × 4 × 3 cm with a bosselated surface and the adjacent remnant of normal salivary gland parenchyma. The cut surface showed a well-encapsulated, gray-white tumor, predominantly solid, with areas of necrosis and small cystic spaces containing mucoid material [Figure 3].

Histologically, it was a salivary duct carcinoma infiltrating, as evidenced by the pleomorphic cuboidal epithelial cells forming solid nests, cribriform and comedone patterns, papillary epithelial projections into duct-like structures, and densely sclerotic hyalinized stroma [Figures 4-9]. The tumor was compressing the adjacent normal-looking salivary acinar component.

Cytopathology

The H and E stained slides were subjected for review. The smears were moderately cellular comprising of cuboidal-to-columnar epithelial cells with pleomorphic vesicular nuclei exhibiting anisonucleosis, open chromatin, and mildly acidophilic cytoplasm attempting acinar structures, with inflammatory necrotic debris.

DISCUSSION

Salivary duct carcinoma is regarded as a high-grade aggressive tumor with morphologic resemblance to ductal carcinoma of the breast. There have been several reports describing the cytologic features of salivary duct carcinoma; however, accurate diagnosis by FNAC can still be difficult due to its nonspecific, high-grade nuclear features.[2-5]

The cellular yield on FNAC of salivary duct carcinoma can vary from low to high, depending on the degree of desmoplasia and necrosis. The tumor cells are large cuboidal or polygonal-to-round in shape with moderate amount of finely granular to finely vacuolated, intact-to-fragile cytoplasm some of the cells have plasmacytoid appearence with mild or moderate degree of nuclear pleomorphism and hyperchromasia. Nucleoli may

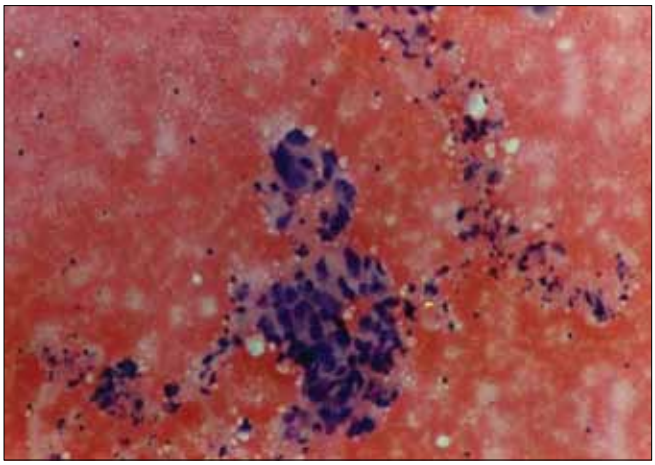

Figure 1: F.N.A.C. — cuboidal to columnar epithelial cells with pleomorphic, vesicular nuclei, mildly acidophilic cytoplasm attempting acinar structures (H and E, 20 x 10)

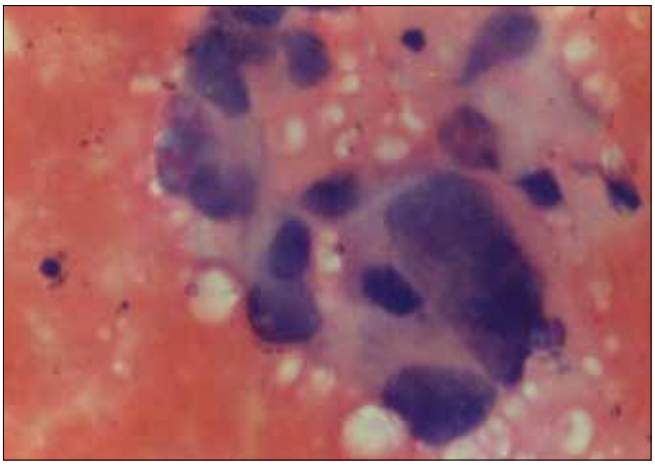

Figure 2: F.N.A.C. — cuboidal to columnar neoplastic cells having abundant delicate cytoplasm, round-to-oval nuclei attempting acinar / ductal structures (H and E, 40 x 10)

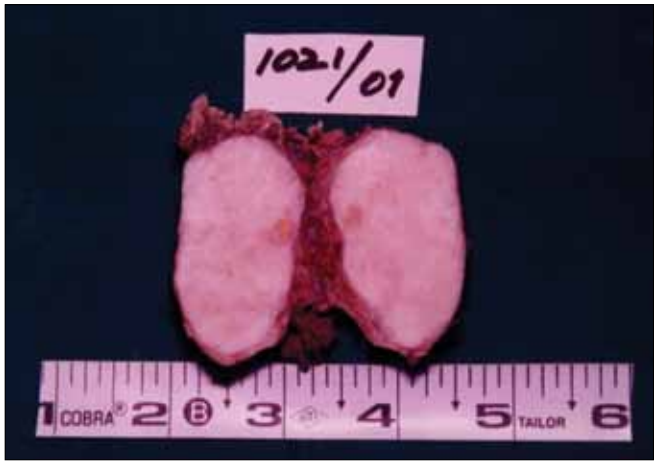

Figure 3: Salivary duct carcinoma — cut section — gray-white homogeneous surface with foci of necrosis and tiny cystic spaces

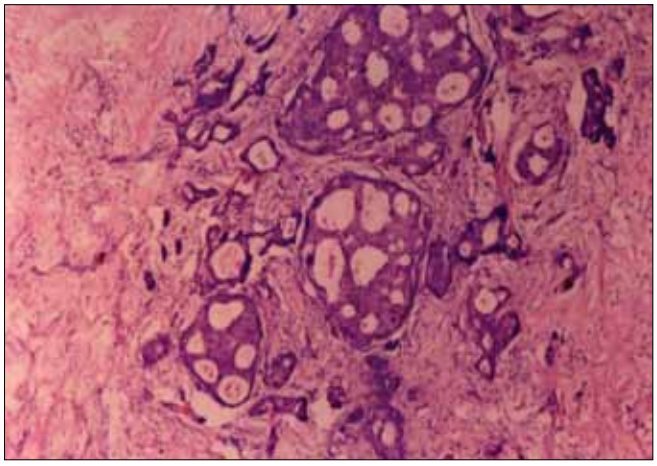

Figure 4: Salivary duct carcinoma — cribriform growth pattern of the neoplastic cells with surrounding hyaline sclerosis of the stroma (H and E, 10 x 10)

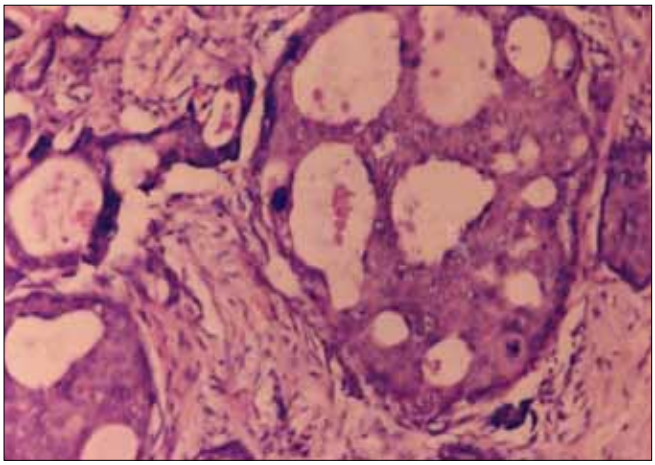

Figure 5: Salivary duct carcinoma — cribriform growth pattern of neoplastic cells (H and E, 20 x 10)

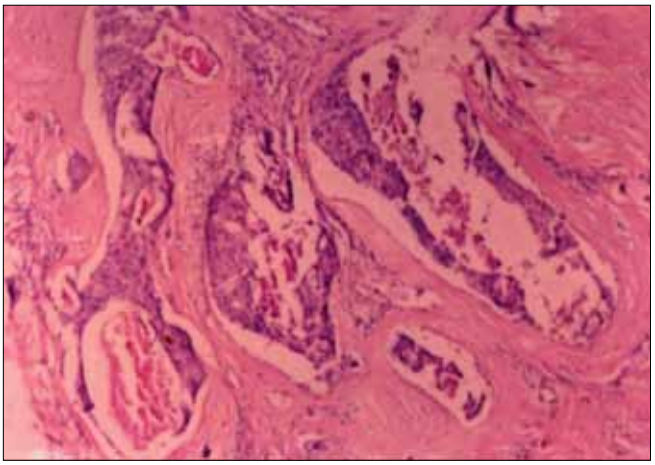

Figure 6: Salivary duct carcinoma — multiple comedones surrounded by hyalinized, sclerotic stroma (H and E, 10 x 10)

or may not be conspicuous. The cells are arranged singly, in loosely cohesive groups, three-dimensional clusters or flat sheets. Background necrosis is variable. Papillary clusters and cribriform pattern are occasionally seen. Cribriform and comedo necrosis patterns are most obvious in cell block material.[2-7]

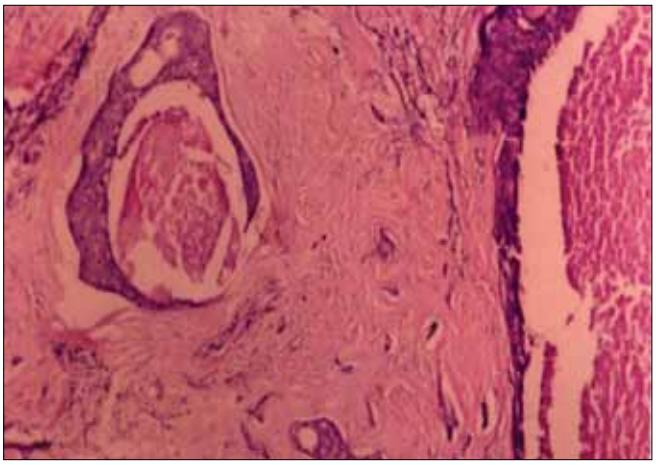

Figure 7: Salivary duct carcinoma — large comedones surrounded by stroma showing dense hyaline sclerosis (H and E, 20 x 10)

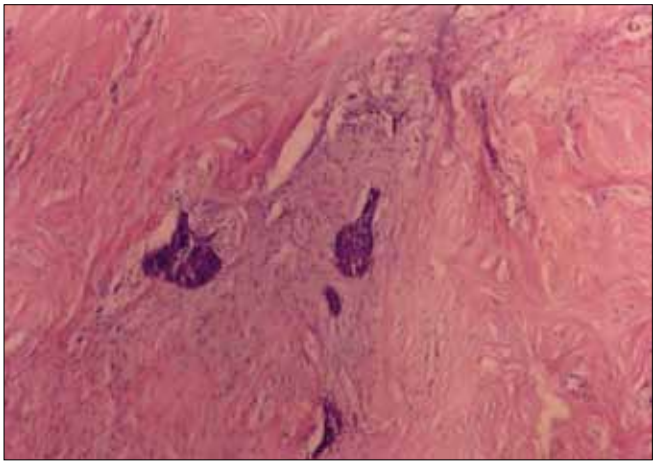

Figure 8: Salivary duct carcinoma — hyalinized sclerotic stroma with duct cell proliferation (H and E, 4 x 10)

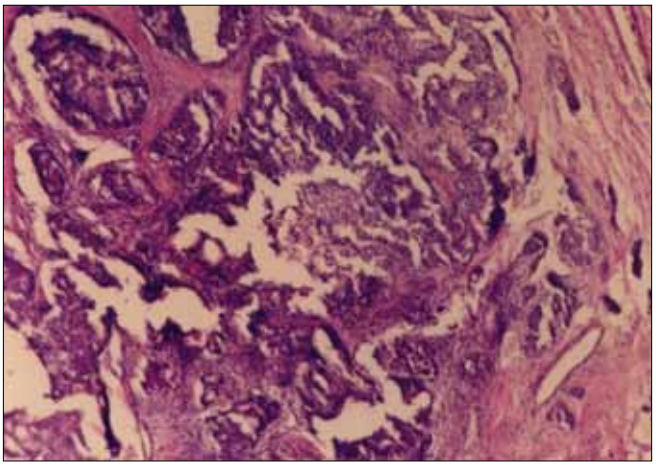

Figure 9: Salivary duct carcinoma — papillary epithelial projections into duct-like structures (H and E, 4 x 10)

It is important to exclude metastatic carcinoma particularly from breast, prostate and lung.[3-5] Although immunohistochemical staining for prostate specific antigen (PSA) and prostatic acid phosphates (PAP) may be useful to identify metastasis from prostatic carcinoma,[3] PSA secreting salivary duct carcinoma with elevated serum levels of PSA, but PAP negative has been reported.[8] Exclusion of primary in the breast and lung must be made largely on clinical grounds, as their cytological appearance may be identical.[3] Expression of the oestrogen receptor is stated to be useful in the definitive diagnosis of these tumors, on cytology.[9] Salivary duct carcinoma is estrogen-receptor negative and occasionally progesterone-receptor positive. It shares most of the other markers of mammary carcinoma. It has been suggested that a negative estrogen receptor together with diffuse intense staining for carcinoembryonic antigen, favor a diagnosis of salivary duct carcinoma over breast carcinoma.[10]

At the time of FNAC, a diagnosis of salivary duct carcinoma is very rarely made. The differential diagnosis offered are high-grade mucoepidermoid carcinoma, adenocarcinoma not otherwise specified (ADC-NOS), oncocytic neoplasms, Warthin's tumor (WT) with nuclear atypia and acinic cell carcinoma.[2-5] Confusion with high-grade mucoepidermoid carcinoma may arise due to the possibility of finding cells with vacuolated and dense cytoplasm resembling mucous and squamoid cells.[2-5] The cytologic features of ADC-NOS may be indistinguishable from salivary duct carcinoma.[5] The apocrine features of salivary duct carcinoma may mislead to a diagnosis of oncocytic neoplasms.[4,5] Salivary duct carcinoma shows a higher nuclearcytoplasmic ratio, less granular cytoplasm, and many three-dimensional clusters. Warthin's tumor, with nuclear atypia, and paucity of lymphoid cells in the background may be mistaken for salivary duct carcinoma. The presence of cribriform, papillary, and comedo patterns, which are best seen on cell block should alert the pathologist to the possibility of salivary duct carcinoma.[4,5] These features are not seen in any of the above-mentioned tumors. The papillary cystic variant of acinic cell carcinoma (ACC) may exhibit a papillary pattern. The variability of cell cytoplasm and absence of nuclear atypia and comedo necrosis in ACC helps in differentiating these lesions from salivary duct carcinoma.[1] Salivary duct carcinoma usually demonstrates a moderate-to-severe degree of nuclear atypia. Of late, low-grade salivary duct carcinoma, exhibiting a mild degree of nuclear atypia is described. A false negative diagnosis of pleomorphic adenoma has been made in these cases.[9]

By FNAC, given the known difficulty in making an accurate diagnosis of salivary duct carcinoma, the identification of a tumor exhibiting a variable nuclear grade, with cribriform, papillary, and comedo patterns, in the appropriate clinical setting of elderly patients with parotid mass and facial palsy, should suggest the diagnosis of this uncommon tumor after excluding metastatic carcinoma, although the present case is relatively younger and without the usual features suggestive of malignancy. This case is being reported because of its rarity and also to add one more case to the existing literature.

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Source of Support: Nil, **Conflict of Interest:** None declared.