Diagnostic Pitfalls of Salivary Duct Carcinoma (SDC)—report of a rare apocrine variant

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INTRODUCTION
Salivary duct carcinoma (SDC) is an uncommon salivary gland malignancy with a highly aggressive behavior and poor prognosis. It occurs either de novo or as part of carcinoma ex pleomorphic adenoma with 5-year-survival rate around 34-50%. Histologically, the tumor resembles high grade breast ductal carcinoma and thought to be derived from intra- or interlobular excretory ducts. The cytological features usually appear as high grade cohesive carcinoma cells requiring consideration of many differential diagnoses. It’s challenging to precisely diagnose at the time of fine needle aspiration (FNA) cytology without ancillary studies. We encountered a rare SDC which exhibited bland oncocytoid features with prominent cytoplasmic granularity leading to undergraded diagnosis.

CLINICAL PRESENTATION
The patient, a 76-year-old male, came to medical attention for left facial swelling over the parotid area for several months and left facial paralysis one week prior to admission. The ultrasonography of the neck revealed a well-defined hypoechoic nodule in the left parotid gland with focal microcalcification. The fine needle aspiration was performed. Facial nerve conduction velocity study showed severe lesion in the left facial nerve. CT scan of the neck soft tissue was ill-defined 3.5 x 3.1 cm moderate enhancing soft tissue mass. The patient later underwent parotidectomy.

MATERIALS AND METHODS
The FNA was performed with a 23 G needle and two smear were obtained, one air-dried slide for Romanowsky stain and one alcohol fixed slide for Papanicolaou stain. The surgical specimen was fixed in formalin, embedded in paraffin and stained with hematoxylin and eosin, and some more slides for immunohistochemical analysis. Immunohistochemistry was performed on a Ventana BenchMark XT automated staining instrument according to the manufacturer's instructions. The antigen-antibody reaction was visualized with the chromogen 3,3'-diaminobenzidine (DAB). The sections were lightly counterstained with hematoxylin.

CYTLOGICAL FINDINGS
The cytological findings showed richly cellular smear with loosely cohesive clusters of round-to-oval cell clusters with slightly enlarged vesicular nuclei, occasional prominent nucleoli, abundant granular cytoplasm and distinct cell borders. Necrosis was minimal. On account of its uniform oncocytic of apocrine features, oncocytoma or oncocytic carcinoma were considered. (Fig.1). The monotonous oncocytoid cells in our SDC case best fit in the diagnostic category IVB (salivary gland neoplasm of uncertain malignant potential) (SUMP) in the Milan system.

DISCUSSION
SDC is an aggressive carcinoma with close histologic resemblance to ductal carcinoma of the breast. The characteristic SDC FNA include cellular smear with cohesive 3D clusters and broad flat sheets with cribriform/papillary pattern, polygonal or low columnar epithelial cells, finely granular or vacuolated cytoplasm, frequent mitotic figures and abundant necrotic debris in the background. Metastatic carcinoma, high grade mucoepidermoid carcinoma, oncocytic carcinoma are usually considered in the differential diagnoses.

Most cases of the SDC in FNA exhibit frank high grade malignant cytological features which can be classified as category VI in the Milan reporting system without reservation. The monotonous oncocytoid cells in our SDC case had abundant granular cytoplasm, low grade nuclear features and low N/C ratio. No cribriform pattern was identified. The cytological diagnosis was placed in the category IVB (SUMP) in the Milan reporting system.

The tumor cells were later confirmed to be histiocytoid variant of apocrine carcinoma cells of SDC based on the histology ground and immunophenotypical findings. We hereby share the experience of unusual low grade cytological features of SDC to add more diversity into the known difficulties in the FNA diagnosis of SDC.

CONCLUSION
Most SDC has features of high grade adenocarcinoma. We hereby share the experience of unusual low grade cytological features of SDC to add more diversity into the known difficulties in the FNA diagnosis of SDC.

REFERENCE
4. Salivary duct carcinoma, Hidehito Takei, MD; Dina R. Mody, MD