Primary small cell carcinoma of the parotid: Fine needle aspiration and immunohistochemical features of a neuroendocrine variant

ABSTRACT
Salivary gland small cell carcinoma (SGSmCC) is extremely rare, accounting for less than 1% of salivary gland tumors. A 42-year-old female patient came to the outpatient clinic due to a mass localized in the left submandibular space and that had been growing since 3-4 months. The fine needle aspiration cytology (FNAC) matched with small cell carcinoma (SmCC). As no other focus was detected by computerized tomography (CT), it was accepted as a primary neoplasm of the parotid gland. The histopathological assessment of the excised material and immunohistochemical staining demonstrated a neuroendocrine differentiation of SmCC. No recurrence was observed during the 54-month follow-up period. We believe this to be the second case of SmCC with neuroendocrine differentiation of the parotid glands reported in Turkish medical literature and will be added to the English database as one of the favorable SmCC cases.

Key words: Fine needle; neuroendocrine; parotid gland; small cell carcinoma (SmCC)

Introduction
Due to its early systemic spread, small cell carcinoma (SmCC) is a neoplasm displaying an aggressive behavior and frequently presents in the lungs.[1] Salivary gland small cell carcinoma (SGSmCC) is extremely rare, observed by less than 1% in malignant parotid tumors, and has a bad prognosis.[2]

Detecting either primary or metastatic SmCC plays a major role in shaping the treatment.

Fine needle aspiration cytology (FNAC) is a simple, cost-effective, and minimally invasive method, applied in head and neck masses.[2,3] Although it is not possible to make a separate distinction as primary or metastatic, its assessment along with the clinical and radiological correlation results in an accurate diagnosis. We are presenting the SmCC case localized at the parotid gland that we had diagnosed with FNAC, along with its histopathological and radiological findings.

Case Report
A 42-year-old nonsmoking female patient came to the outpatient clinic with a painless left parotid mass that had been slightly growing within the last 3-4 months. A mobile mass of 2 cm × 2 cm in diameter was palpated in the left parotid lodge. On magnetic resonance (MR) examination a 14.8 mm lesion was observed in the left parotid superficial...
lobe. It was isointense to parotid gland on T2 spin-echo (SE) and hypointense to parotid gland on T1 SE sequences. No mass was detected in the lungs by computerized tomography (CT). Aspiration materials were quite cellular and some of them were formed of singular cell clusters while others were formed of loose cell clusters. Moderately pleomorphic small cells with a narrow cytoplasm, oval-round nucleus, displaying a nuclear molding, and having a salt-and-pepper chromatin pattern were observed in the May-Grünwald-Giemsa (MGG) stain [Figure 1a]. These findings were consistent with SmCC.

Upon the diagnosis of a SmCC, left superficial parotidectomy with facial nerve preservation and a left modified neck dissection in levels I-IV were performed.

The microscopic findings were consisted with SmCC. Mitotic rate was higher (>50 per 10 HPF) and there were necrotic areas in the neoplasm [Figure 1b]. Immunohistochemical staining provided a positive result with neuron-specific enolase (NSE), Synaptophysin, [Figure 1c] and Chromogranin A while epithelial membrane antigen (EMA), carcinoembryonic antigen (CEA), cytokeratin (CK) 7, CK20, thyroid transcription factor 1 (TTF-1), and S-100 protein were negative. Based on the cytomorphological and immunohistochemical findings, it was diagnosed as SmCC displaying a neuroendocrine differentiation. The surgical margin was negative. The patient underwent postoperative chemotherapy and radiation therapy. Postoperative 20 Gy radiation was administered. No recurrence was observed during the 48-month follow-up period.

Discussion

SmCC that mostly presents in the lungs is more rarely reported in the nonlung areas.[1] Available data were retrieved for 44 cases that fully satisfied the inclusion criteria; the median age was 64.25 years and the male:female ratio was 2.4:1. The overall 1-, 2-, and 5-year survival rates were 75.3%, 56.4%, and 36.6%, respectively.[4] The patients presented with a short-term nonsensitive soft tissue mass. Our patient, who was a 42-year-old female, came to the hospital with a painless left parotid mass that had been growing within the last 3-4 months.

SmCC localized in the salivary glands, which is seen by less than 1% among major glands, occurs at a rate of 2.8% among minor salivary gland tumors.[2] Due to its rare localization, the possibility of metastasis from nonsalivary gland areas should be excluded when making a diagnosis of SmCC.[3]

Clinical findings have limitations in detecting malignant parotid tumors. Therefore, preoperative aspiration cytology and imaging has assumed a major role in surgical planning for assessing the location and malignancy of the tumor.[2,3]

In the differential diagnosis for our case, metastatic carcinomas were considered. The clinical and radiological exclusion of the presence of tumor in the lungs and nonlung areas made us shy away from the diagnosis of metastatic carcinoma. Although, the uniformly round shape of the nucleus rather than being irregular and spindle-shaped, its presentation with less pleomorphism, and the detection of cytoplasmic red granulations in the MGG stain in some of the cells was interpreted as Merkel cell carcinoma,[5] there were no dermatological lesions and defined cytological features in the left parotid localization of our case.

Certainly, it is necessary to include lymphoma in small round cell neoplasms into differential diagnosis and it is important not to detect any lymphoglandular material.[3] We did not observe any red granulations and lymphoglandular entities. We did not observe thin acidophilic rims that are in favor of Merkel cell carcinoma and hematoxylin and eosin (H&E) cross-sections in the cytoplasm.

In the majority of SmCC cases, the tumor cell expresses at least one of the neuroendocrine markers.[6-8] We detected that the tumor cells expressed all three endocrine markers.

The SmCCs of the parotid gland display a better prognosis compared to SmCCs localized in the lungs and nonlung areas.[3,4]
The treatment is composed of surgery, complementary radiation, and chemotherapy. Nagao et al. reported in their study on SmCCs localized in the salivary gland in 15 cases that the tumor diameter was >3 cm and the CK20 was negative, which significantly reduced average survival in the decreased neuroendocrine marker immunoreactivity. The fact that our case had a tumor with a diameter of 1.5 cm and the positivity of all three neuroendocrine markers demonstrate that the disease will probably have a better course. We observed no recurrence or metastasis during the 54-month follow-up period.

Due to the rarity of primary neuroendocrine SmCC, there is currently no definite treatment regimen, and there is little prognostic data on neuroendocrine SmCC of the parotid gland. We believe that our case will be the second case of primary small cell neuroendocrine carcinoma of the parotid gland reported from Turkey and will be added to the English database as one of the favorable SmCC cases.

We would like to propose that while making a diagnosis with FNAC in a SmCC localized in the extrapulmonary area, it should be noted that it can only be primary and that it should be correlated clinically and radiologically and then substantiated via immunohistochemistry.

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Conflicts of interest
There are no conflicts of interest.

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