Case Report

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A Case Report and Literature Review of Metastatic Small Cell Carcinoma in Parotid Gland

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ABSTRACT

Small cell lung cancer usually presents as a progressive disease in over 70% of patients. Common organs of metastasis include the liver, adrenal glands, bones, and brain. However, metastasis to the parotid gland is uncommon, as it has been discussed only in case reports. Among all parotid tumors, small cell cancer is rare, seen in only 1.7%.A 60-year-old man presented with a slow-growing, painless tumor of the left parotid gland and peripheral facial paralysis. Neck ultrasound identified a solid mass in the left parotid gland with enlarged lymph nodes in the parotid gland and ipsilateral neck lymphadenopathies with pathologic features in levels 2 and 3. Chest computed tomography (CT) demonstrated subsegmental collapse in the lingula with peribronchial cuffing in this lobe and mild cylindrical bronchiectatic changes in the left lower lobe. CT also showed multiple mediastinal lymphadenopathies in prevascular, paraaortic, and paratracheal spaces. Core needle biopsy was done, and initial analysis revealed small cell carcinoma in the left parotid gland. Immunohistochemical analysis of the specimen demonstrated and confirmed the diagnosis. The patient was then referred to the radiation oncology unit for treatment. Chemotherapy was initiated with a combination of cisplatin and etoposide. No complications of the chemotherapy were observed after three cycles; treatment and follow-up are ongoing. No irradiation was performed after evaluation by the radiation oncology department. Due to the advanced stage of his disease, treatment is set for palliative purposes only.

Small cell lung cancer diagnosed from solitary metastasis to the parotid gland is very rare. Physicians should keep pulmonary origin in mind when faced with a parotid tumor, as without careful examination, the primary focus may be overlooked, negatively impacting survival rates and the prognosis of the patient. Overall, this finding carries a poor prognosis, but the mainstay of treatment is palliation with systemic chemotherapy and possibly irradiation to control symptoms.

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Introduction

Primary parotid tumors are mainly benign pleomorphic adenomas in adults [1]. Malignant lesions are not common, but mostly include mucoepidermoid carcinomas, adenocystic carcinomas, and malignant mixed carcinoma [2]. Small cell carcinoma histology of parotid tumors is rarely observed, accounting for only 1.7% of parotid gland tumors [1].

Small cell carcinoma is considered the most aggressive type of neuroendocrine carcinoma. According to epidemiological reports, small cell carcinomas most commonly occur in the lung, and extrapulmonary small cell carcinoma is very rare, only accounting for 2–4% of all small cell carcinomas [3]. Small cell carcinoma of the salivary glands can occur in both major and minor salivary glands, with most cases affecting the parotid gland [4].

This rare cancer occurs mostly in men over 50 years of age. Patients usually present with a painless mass that may develop rapidly over several months and then gradually present with pain, paresthesia, and facial nerve palsy. Histological examination is the most reliable way to confirm small cell carcinoma of the salivary gland, defined as a primary malignant tumor of the salivary gland composed of small, undifferentiated cells with neuroendocrine differentiation [5].

Small cell carcinoma often shows aggressive behavior associated with higher metastatic potential and poor survival. Similarly, a previous case series showed that 50% of salivary gland small cell carcinomas had regional lymph node invasion and 41.7% of them had distant metastases [6]. Surgery, radiotherapy, and chemotherapy are considered the main treatments. Due to earlier detection related to the superficial location of this tumor, small cell carcinoma of the salivary gland seems to have a favorable survival time compared with other sites. Available information from case reports suggests that the most consistent predictors of overall survival for patients may be age, tumor size, and metastasis [6-8].

The current report presents a rare case of small cell parotid carcinoma metastasized most probably from the lung that was diagnosed in a 69-year-old man. The report also describes the examination and treatment plan and provides a review of the literature on current standards of care.

Case Presentation

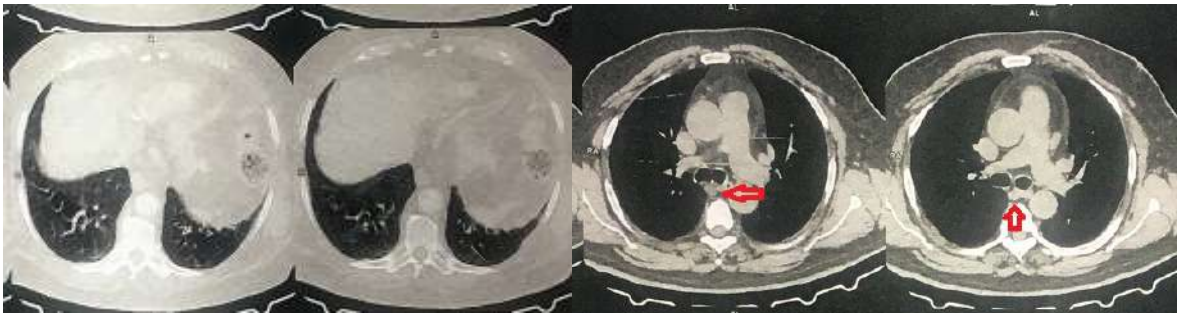
In February 2024, a non-smoker 69-year-old man presented at the Department of Otolaryngology, Head and Neck Surgery, Hospital of Amiralam, Tehran University of Medical Sciences, Tehran, Iran with a painless mass below the left ear that had been present for four months. Additionally, peripheral left facial paralysis had been added to his symptoms for a month. The patient showed no symptoms of coughing, expectoration, or haemoptysis. A physical examination revealed a 3.0 × 2.0 cm mass with poor mobility in the left parotid region. The accompanying peripheral facial paralysis on the left side was classified as House-Brackmann Grade six (Figure 1).

Fig. 1. Left parotid mass with ipsilateral facial paralysis

Neck ultrasound identified a solid mass in the left parotid gland with enlargement of the left lymph nodes in the gland and left neck levels two and three with pathologic features.

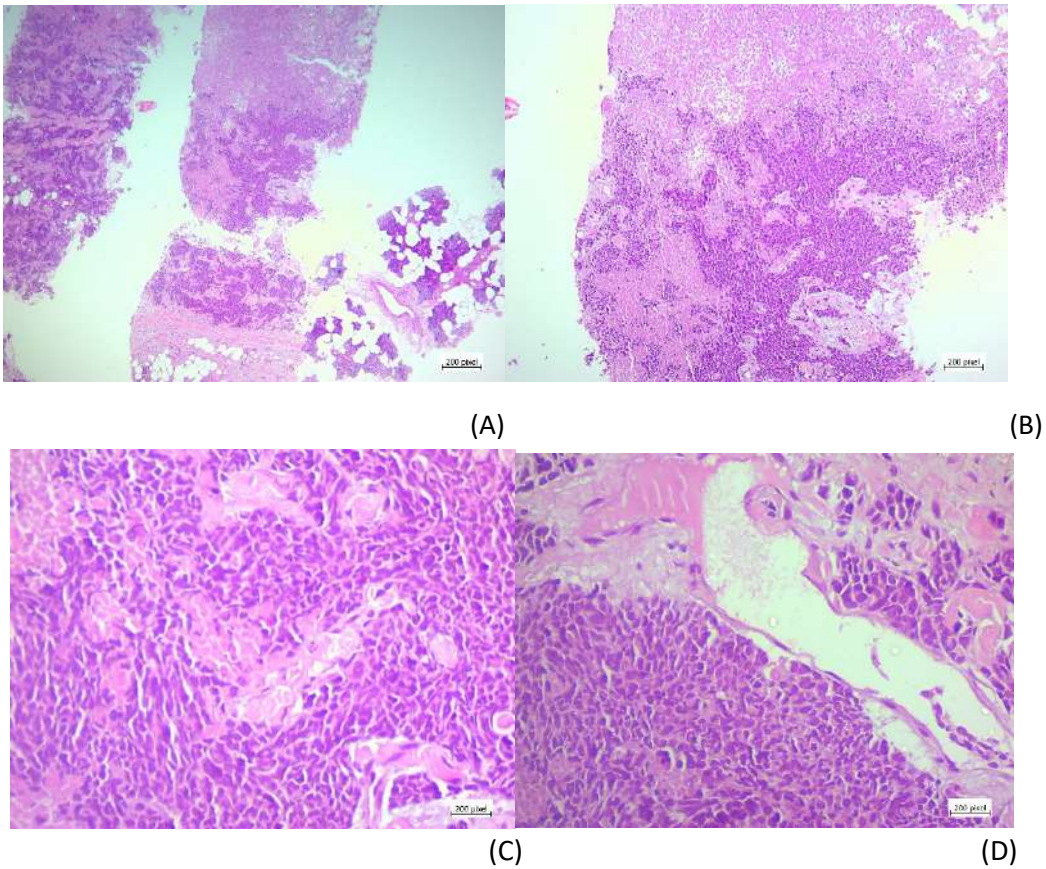
Chest computed tomography (CT) demonstrated subsegmental collapse in the lingula with peribronchial cuffing in this lobe and mild cylindrical bronchiectatic changes in the left lower lobe. CT also showed multiple mediastinal lymphadenopathies in prevascular, paraaortic, and paratracheal spaces (Figure 2).

He was referred to a radiologist, and a core needle biopsy of the left parotid mass was done. Haematoxylin and eosin staining was performed on sections from the parotid gland. The results identified an invasive small cell carcinoma (Figure 3). Immunohistochemical analysis of the core needle biopsy specimen indicated positive staining for synaptophysin, C-kit, AE1/AE3, and Thyroid Transcription Factor-1 (TTF-1). Ki-67 was more than 70% positive, revealing a high proliferation index (Figure 4).



(A) (B)

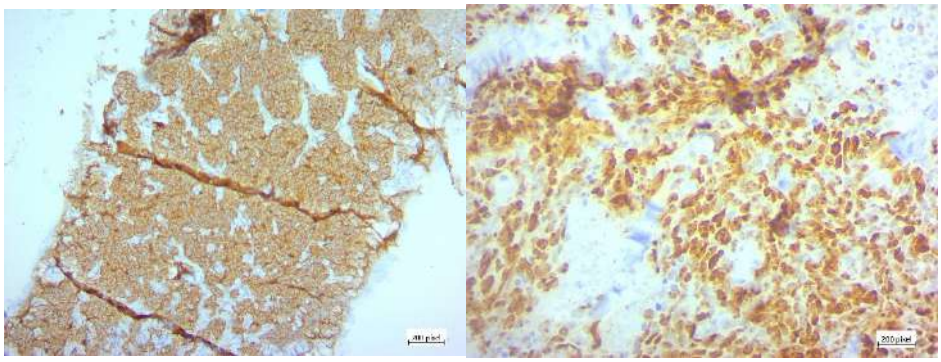
Fig. 2. Lung CT scan showing (A)subsegmental collapse in the lingula with peribronchial cuffing in this lobe and mild cylindrical bronchiectatic changes in the left lower lobe. and (B) multiple mediastinal lymphadenopathies (red arrows)



(A) (B)

(C) (D)

Fig. 3. Hematoxylin and eosin staining of the parotid gland core needle biopsy specimen (A – D). Magnification: 200



(A) (B)

Fig. 4. Immunohistochemical analysis of core needle biopsy of the parotid gland. A: Positive staining of synaptophysin B: Positive staining of Ki-67. Magnification: 200

He subsequently underwent a metastasis workup. A CT scan of the head, abdomen, and pelvis showed no other metastasis. The patient started to undergo six cycles of chemotherapy with a combination of cisplatin and etoposide: days 1-3, 75 mg/m² cisplatin intravenously and 100 mg/m² etoposide intravenously; day 4, 100 mg/m² etoposide intravenously; day 5, 50 mg/m² etoposide intravenously, and the cycle was repeated every 20 days. Supportive therapy was also provided. No complications of the chemotherapy were observed after three cycles; treatment and follow-up are ongoing. No irradiation was given after evaluation by radiation oncology. Due to the extensiveness of his disease, treatment is set for palliative purposes only.

Ethical approval was not required for this case report. The patient provided written informed consent for the publication of their data.

Discussion

Typical metastatic sites for small cell lung cancer are the liver, adrenal glands, bones, brain, and rarely the parotid gland. Metastasis to the parotid gland itself is very rare. The most common sources of metastasis to the parotid gland are the skin of the head and neck and upper trachea-esophageal structures. 80% of parotid metastases originate from head and neck malignant tumors [9]. Distant metastases to the parotid gland can arise from sources such as the kidney, colon, prostate, breast, and bronchus. In a series on 520 patients with parotid gland tumors, 33 patients had metastatic origin: 23 squamous cell carcinoma, 7 melanoma, 2 breast cancer, and 1 rhabdomyosarcoma [10]. Small cell lung carcinoma can spread via lymphatic, hematologic, or direct invasion. The spread of primary small cell lung cancer from the right hilum to the unilateral parotid gland is most likely via a direct or hematogenous route. Isolated metastases may be due to individual variations in anatomy and lympho-vascular drainage. The proximity of the primary tumor to blood vessels, as well as tumor-induced angiogenesis and lymphangiogenesis, are essential components for tumor growth and metastasis [11].

Because of its rarity, metastases of small cell lung cancer to the parotid gland have only been described as case reports. To the best of our knowledge, only eight cases have been reported (Table 1) [1, 12-16]. Previous observations in cases of small cell lung carcinoma metastasizing to the parotid gland have shown that these patients rarely survive more than 10 months [1]. The median survival rate of patients with small cell lung cancer indicates a poor prognosis for these patients.

Comprehensive physical examination, imaging, and histopathology are required for diagnosis. Although solid masses with poor mobility and high growth rates are usually associated with a high grade of malignancy, the decisive diagnosis relies on needle and excisional biopsies. It is important to perform a chest X-ray, CT scan, and ultrasound to identify the primary lesion. Additionally, metastasis of small cell lung cancer suggests an advanced stage of lung cancer, so screening for metastases, including a CT scan or whole-body Positron Emission Tomography (PET) scan, is necessary.

The treatment of metastatic parotid tumors is a topic of debate. Parotid metastasis, although isolated, can be a sign of late-stage advanced small cell lung cancer. In limited small cell lung cancer, early disease can be cured with a combination of chemotherapy and irradiation, while widespread disease rarely has a positive outcome. Based on the available literature, metastasectomy does not improve overall survival. However, systemic chemotherapy may improve quality of life and potentially improve survival in some patients [9]. It is essential to differentiate between primary and metastatic parotid tumors based on pathology and imaging studies due to different treatment modalities and prognosis. It is critical

Table 1. Previous case reports of metastasis of small cell lung cancer to the parotid gland

Number	Author/Year	Sex/ Age (year)	Examination/ primary lesions	Other systemic metastases	Treatment	Survival
1	Joel et al. [12]/ 1988	Male/ 54	Chest X-rays, Chest CT and sputum cytology/ left hilar lung mass and mediastinal adenopathies	Liver, adrenal	Radiation and chemotherapy	Living at the time of the report
2	Ulubas et al.[1]/ 2010	Male/ 59	Chest X-rays and CT/ left lung	Bone	Chemotherapy	Died 10 months since his diagnosis
3	Shi et al. [13]/ 2014	Male/ 61	Chest X-rays, Chest CT/ right upper lung lobe mass and mediastinal adenopathies	Not mentioned	partial parotidectomy and facial nerve dissection, adjuvante radiation and chemotherapy	Not mentioned
4	Stephani C. Wang et al. [14]/ 2017	Male/ 75	Chest CT/ Right hilar mass and mediastinal adenopathy	No metastasis	Chemotherapy	Not mentioned
5	Yu Cui et al. [15]/ 2019	Male/64	Chest CT/ upper and middle lobes of the right lung and intermediate bronchus	Liver	Total parotidectomy, adjuvant chemotherapy	Living at the time of the report
6	Rulan Wang et al. [16]/ 2022	Male/ 42	Chest CT/ right hilar mass	Head, right adrenal	Radiation and chemotherapy	Died nine months after the completion of treatment
7	Rulan Wang et al [16]/ 2022	Male/ 61	Chest CT/ left hilar mass	Right lung, left axillary nodes, left adrenal and head	Chemotherapy	Died three months since his diagnosis.
8	Rulan Wang et al [16]/ 2022	Male/ 50	underwent the surgery for early left lung cancer	Head, parapharyngeal space	Radiation and chemotherapy	Lost contact after four cycles of chemotherapy

to consider the possibility of small cell lung cancer metastasis in cases of parotid tumors.

In this present case, chemotherapy combining cisplatin and etoposide was administered because of the sensitivity of small cell lung cancer to these drugs. No obvious complications were seen after three cycles of treatment, and no disease progression has been observed during follow-up.

Conclusion

Small cell lung cancer metastases to the parotid gland are rare and have a poor prognosis. Physical examination, diagnostic imaging, such as chest X-ray, CT scan, MRI, and histopathological analysis are necessary for a definitive diagnosis.

The standard of care for extensive-stage remains cisplatin or carboplatin with etoposide. However, there is no known optimal treatment protocol for those with parotid metastasis from small cell lung cancer that can prolong survival. Irradiation for pain control and early palliative care interventions to improve quality of life remain important aspects of the overall management of this deadly malignancy.

Ethical Considerations

Compliance with ethical guidelines

There were no ethical considerations to be considered in this article.

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Conflict of Interests

The authors have no conflict of interest to declare.

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