

Facial Nerve Preservation In Treatment Of Primary Parotid Squamous Cell Carcinoma: A Case Report

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Abstract

Background

Primary squamous cell carcinoma rarely occurs in parotid gland. Partial, superficial or total parotidectomy as well as radical resection is performed based on patients' conditions. For patients with symptoms of facial nerve weakness or dysfunction, facial nerve preservation is considered justifiably, whereas groundlessly if the malignancy is asymptomatic. We hereby reported a case of symptomatic primary parotid squamous cell carcinoma performed with total parotidectomy and facial nerve preservation.

Case summary

With the complaint of an asymptomatic mass in right parotid gland for five years and it grew aggressively and pricked recent months, a 46-year-old man visited the local hospital two week ago. A biopsy was performed and squamous cell carcinoma in right parotid gland was diagnosed. He was subsequently referred to Tongji hospital in Wuhan, China. Physical exam revealed a scar in the right parotid gland and impaired function of right facial nerves. An immovable mass was touched in lower and posterior pole of right parotid gland. The mass was about 2.1*3.1 cm without clear boundary, and moderate pain was observed. No obvious enlarged lymph node was touched in right submandibular region and neck. Magnetic resonance imaging revealed a 1.6*2.4 cm nodular located in a diffuse suspicious mass in right parotid gland. Radical resection of the malignancy was rejected due to the inevitable facioplegia. Considering the short history of tumor aggressive behaviors, unique anatomical structure of parotid gland and absent sign of lymph node metastasis, total parotidectomy with facial nerve preservation and elective right neck dissection were performed. Final pathological examination confirmed squamous cell carcinoma of right parotid gland. Post-operation radiotherapy was scheduled in the following month. Restoration of facial nerve function was observed in two months later, absent local recurrence and distant metastasis was observed in the three years' follow-up.

Conclusion

Primary parotid squamous cell carcinoma is rarely observed in clinical and facial nerve sacrifice requires great attention in treatment. Based on carefully evaluation of patients' conditions before treatment, individualized treatment is crucial for improvement of patients' quality of life while completely dissection of the malignancy.

Core Tip

A rare case of symptomatic primary squamous cell carcinoma in right parotid gland was reported here. After comprehensive consideration of short history of aggressive behaviors, unique anatomical structure of parotid gland nerve and absent sign of neck lymph node metastasis, total parotidectomy with facial nerve preservation, rather than a radical resection of this malignancy was performed. The patient received

post-radiotherapy in the following month. Restoration of facial nerve function, absent local recurrence and distant metastasis was observed in the three years' follow-up.

Introduction

Parotid gland is an organ with irregular shapes underneath the face, which can be roughly divided into superficial and deep lobe area. Facial nerves generally locate between the superficial and deep lobe area, which is sensitive to stimulations such as pressure, inflammation and tumor invasion, *etc.* Therefore, malignancies adjacent to/invoke facial nerve may be more easily noticed at early stage than other anatomic sites. In addition, the anatomical structure of parotid gland is unique. Superficial and deep lobe area of parotid gland, even gland bubbles are enclosed by dense parotid fascia. In purulent parotitis, parotid fascia inhibits purulent secretion flowing among gland bubbles, which may serve as a physical barrier to inhibit cancer invasion from/to superficial skin or nearby nerves/muscles either. Therefore, prognosis of patients with malignancies occurred in parotid gland may be better than other anatomic sites.

Squamous cell carcinoma is a common malignancy occurred in oral and maxillofacial-head and neck. Experiments and clinical evidence suggest squamous cell carcinoma may infiltrate into surrounding tissues, which is associated with local recurrence and poor prognosis^{1,2}. Therefore, radical excision with reconstruction by free thigh flap or transposition of flap if necessary is routinely performed to ensure negative surgical margins and restore partial function. Squamous cell carcinoma rarely occurs in parotid gland³. In consideration of poor prognosis of this high-grade malignancy in other anatomic sites, facial nerve sacrifice is presumably performed for parotid squamous cell carcinoma with facial nerve weakness/dysfunction world widely. For patients suffering from this malignancy without facial nerve symptoms, decision of facial nerve sacrifice is based on doctors' experience rather than clinical guidelines/evidences.

In this study, we report a rare case of symptomatic primary squamous cell carcinoma in parotid gland, whereas total parotidectomy with facial nerve preservation, elective neck dissection and post-operation radiotherapy was performed. Facial nerve function was restored in next two months, absent local recurrence and distant metastasis was observed in the three years' follow-up. We aim to inform clinicians that individualized treatment is crucial for improvement of the quality of life.

Case Presentation

Chief complaints

A 46-year-old man was referred to Tongji hospital in Wuhan, China, with the diagnosis of squamous cell carcinoma in right parotid gland.

History of past illness

With the complaints of an asymptomatic mass in right parotid gland for five years and it grew aggressively and pricked recent months, the patients visited the local hospital two weeks ago. A biopsy was performed and squamous cell carcinoma of right parotid gland was diagnosed.

Personal and family history

The patient had a history of tobacco consumption (two cigarettes per day for over ten years), and he was generally in good health.

Physical examination upon admission

A scar was found in the right parotid gland and impaired function of right facial nerves was observed (mild distortion of commissure). An immovable mass was touched in lower and posterior pole of right parotid gland. The mass was about 2.1*3.1 cm without clear boundary, and moderate pain was observed. No obvious enlarged lymph node was touched in right submandibular region and neck.

Laboratory examinations

The blood biochemical test showed no significantly abnormality.

Imaging examinations

Magnetic resonance imaging (MRI) showed a 1.6*2.4 cm nodular located in a diffuse suspicious mass in right parotid gland, and no obvious swelling lymph node in the neck (Fig.A-B). Other examination results, such as B ultrasonography for lymph node in neck and CT for chest, were normal.

Treatment

In consideration of potential disseminated planting in first biopsy operation, occult surrounding invasion and lymph node metastasis at this attendance, a radical resection and elective right supraomohyoid neck dissection was prior recommended, which was refused by the patient due to the unacceptable facioplegia. Though pre-warning with the risk of local recurrence and poor prognosis, an alternative plan, total parotidectomy with facial nerve preservation and right supraomohyoid neck dissection, was accepted. During the surgery, the malignancy was found to be locating in the superficial parotid gland and adjacent to facial nerves. This patient was prescribed postoperative radiotherapy in the following month (local intensity-modulated radiotherapy, 3 Gy per day for 28 days).

Outcome and follow-up

Final pathological examination confirmed squamous cell carcinoma in right parotid gland and no lymph node metastasis in neck (Fig.C-D). Restoration of right facial nerve function was observed two months after operation, and no local/regional recurrence or distant metastasis was detected in the three years-postoperative follow-ups.

Discussion

Primary squamous cell carcinoma of parotid gland is a rare malignancy, whereas 5-year survival rate is reported less than 50%⁴. Diagnosis of primary parotid squamous cell carcinoma requires the malignancy is pre-ruled out of invasion and metastasis from respective cancers of nearby and distant anatomic sites, as well as distinguished from other malignancies such as mucoepidermoid carcinoma⁵. In this case, the patient had no history of other malignancies before the first attending, physical exam and image test excluded invasion and metastasis of other malignancies and pathologists confirmed squamous cell carcinoma of parotid gland. Therefore, we considered the patient suffered from primary squamous cell carcinoma of parotid gland in stage T2N0M0.

Impaired function of facial nerve is partially, if not all, attributed to cancer invasion in most cases, whereas facial nerve dysfunction was more likely associated with the injury due to biopsy in present report. However, disseminated planting may accompany the surgery. Superficial/total parotidectomy with facial nerve sacrifice is empirically, rather than evidence-based, performed for these symptomatic patients in our institution, which is presumably occurred world widely. In this case, beside with patient's persistent of facial nerve function, other cofactors associated with decision on the facial nerve preservation include: 1) as introduced above, the unique anatomical structure of parotid gland inhibit tumor progression. 2) MRI suggested the malignancy was constricted in the superficial parotid gland. 3) therapeutic effect of postoperative radiotherapy was further scheduled.

Clinical guideline, even expert consensus, of facial nerve preservation in surgical treatment of parotid squamous cell carcinoma with facial nerve abnormalities is lacking. Recently, one analysis from a cohort comprised of 195 patients with various gland malignancies, such as mucoepidemoid carcinoma, salivary duct carcinoma and squamous cell carcinoma, suggests there is no statically different survival between facial nerve preservation and sacrifice, which is in consistent with several reports⁶⁻⁹. These evidences informed that facial nerve preservation in treatment of the gland malignancy was applicable, though cofactors in these reports such as absent information of facial nerve dysfunction, tumor budding, various pathological histology such as perineural/lymphatic invasion, cancer grade as well as the small scale of patients involved, make it is difficult to draw a definite conclusion. More evidences are required to explore the impact of facial nerve preservation over patients' prognosis.

It is reported that primary squamous cell carcinoma of parotid gland has no different characteristics relative to squamous cell carcinoma of other atomistic sites¹⁰. Still, evidence-based survival estimates of superficial and total parotidectomy for the symptomatic superficial parotid malignancy are lacking. In this case, total parotidectomy was performed based on the following considerations: i) potential intraparotid node metastasis. A study consisted of a series of 53 parotid primary squamous cell carcinoma specimens suggests there is a considerable rate of occult/obvious intraparotid node metastasis, which is believed to be associated with local recurrence and poor survival³. ii) occult tumor budding. For squamous cell carcinoma, tumor budding is reported to be positive in 37.5% and 83.3% surrounding tissues of early localize and metastatic ones, respectively². iii) to remove the "seeds"

associated “soil”, such as the accompanied cancer associated macrophages, neutrophils and fibroblasts, which play a vital role in cancer local/regional relapse¹¹.

Conclusion

Taken together, we present a case of squamous cell carcinoma in right parotid gland with facial nerve symptoms in the article. In considering of the short history of tumor aggressive behaviors, unique anatomical structure of parotid gland and absent sign of lymph node metastasis, local tumor resection, total parotidectomy with facial nerve preservation, right supraomohyoid neck dissection was performed and post-operation radiotherapy. The patient was further prescribed postoperative radiotherapy. Restoration of facial nerve function, absent local/regional recurrence and distant metastasis was observed in the followed-up. This case informs facial nerve preservation based on comprehensive evaluation of patients’ conditions before treatment, is essential to improve patients’ quality of life.

Declarations

Ethics approval and consent to participate

This study was approved by the institutional review board of Tongji Hospital, Tongji Medical College, Huazhong University of Science and Technology.

Consent for publication

Informed written consent for participation and publication was acquired from the patient.

Data availability statements

The datasets used during the current study are available from the corresponding author on reasonable request.

Competing interests

All authors declared no competing non-financial interests.

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This study has no funding.

Authors' contributions

Dr. Zhao: study design, data collection, analysis and manuscript preparation. Dr. Cheng, Luo and Huang: data collection, analysis and manuscript preparation.

The study protocol is performed in accordance with the relevant guidelines.

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Figures

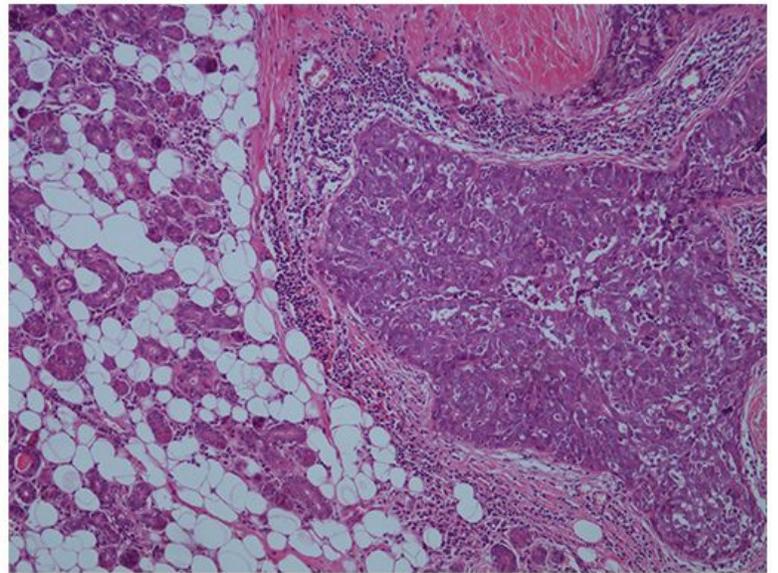
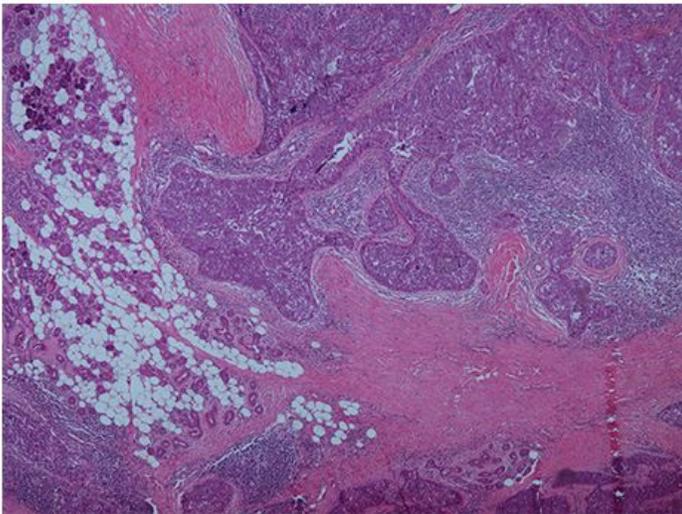
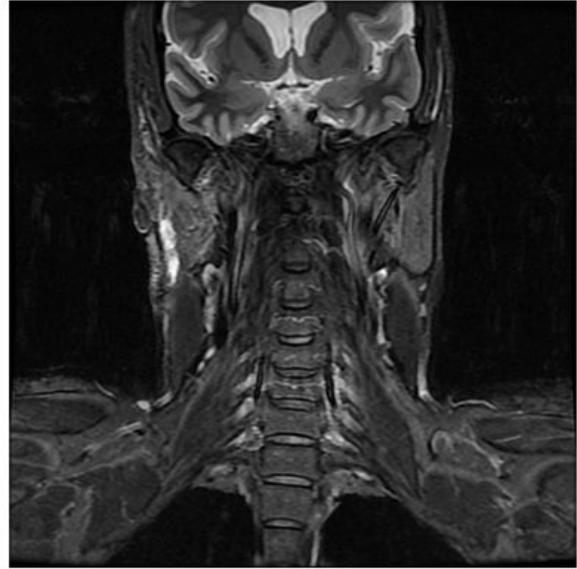
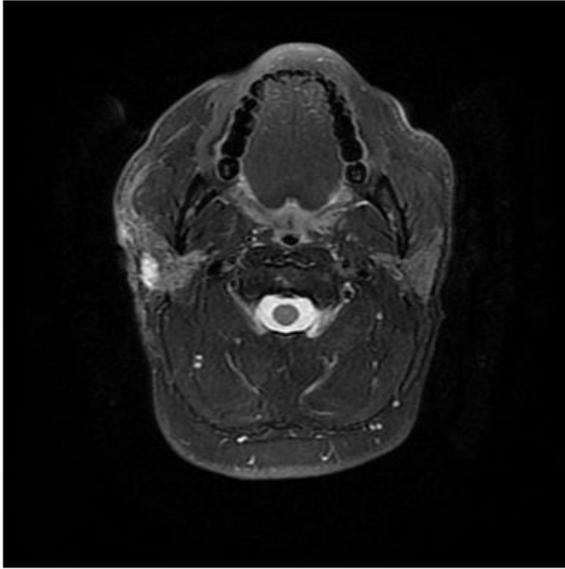


Figure 1

A: Axial T2-weighted image with fat-suppression technique (T2 IDEal) showed superficial parotid lobes was involved by the mass. B: Coronal plane with fat-suppression technique suggested (OCor STIR) the mass involvedg lower parotid lobes and partial cleidomastoid. C: Destruction of parotid lobes in right superficial parotid gland and squamous cell carcinoma cells arranged in nest-like bulk (x4). D: Squamous cell carcinoma was medium differentiated and No evidence of perineural invasion and tumor budding