

ORIGINAL ARTICLE

Metastasis to parotid gland from non Head and Neck tumors

Enzo Emanuelli¹, Andrea Ciorba², Daniele Borsetto¹, Diego Cazzador¹, Samantha Sarcognato³, Filippo Marino³, Stefano Fusetti⁴, Chiara Bianchini², Francesco Stomeo², Stefano Pelucchi²

¹Department of Neuroscience, Operative Unit of Otorhinolaryngology, University of Padua, Padua, Italy; ²ENT & Audiology Department, University Hospital of Ferrara, Cona, Italy; ³Department of Medicine-DIMED, Anatomic Pathology and Cytopathology Unit, University of Padua, Padua, Italy; ⁴Department of Neuroscience, Maxillofacial Surgery Service, University of Padua, Padua, Italy

Summary

Purpose: Most primary tumors spreading metastasis to the parotid gland are usually located in the head and neck region, nonetheless, rarely, parotid gland can also be the target of metastatic localization site of distant primary tumors. The purpose of this study was to describe a clinical series of metastasis to the parotid gland from distant primary tumors (non Head & Neck).

Methods: The clinical databases of parotid tumors in two academic centers have been analyzed and 11 cases of parotid metastatic cancers from distant primary tumors were found.

Results: Primary tumor was lung cancer in 8 cases, and

breast cancer, gastric carcinoma and pancreatic carcinoma in one case each.

Conclusions: Parotid metastases can be the first clinical manifestation of a malignant tumor from a distant site and can manifest years after curative-intent treatment of the distant primary. Histopathology and immunohistochemistry can help in the identification of the primary site. Parotidectomy with complete excision of the parotid lesion may have diagnostic and/or loco-regional control and/or curative intent, however there is still no international consensus about the therapy of parotid malignant metastasis.

Key words: distant primary, fine needle aspiration cytology, malignant, metastasis, parotid, tumor

Introduction

Metastases to the parotid gland are rare [1]. Most primary tumors spreading metastasis to the parotid gland are usually located in the head and neck, however parotid gland can also be the target of metastatic localization site of distant primary tumors. Even though this occurs rarely, clinician should always be aware of this possibility [2]. Cancers can spread to the parotid gland through the blood and lymphatic systems. So far there are only some case reports in the literature and very few series of metastases of distant primary

tumors to the parotid gland. In particular, such metastases have been reported from breast cancer [3], renal cell carcinoma [4], small cell carcinoma of the lung [5], melanoma [6], endometrium [7], gastrointestinal tract [7,8], liver [9], testicular seminoma [10], prostate and infraclavicular skin [11-13].

The purpose of this study was to present a clinical series of metastasis to the parotid gland from distant primary tumors, describing also the clinical features and their management.

Methods

Parotid tumors registered between January 1st 1965 and December 31st 2015 in the databases of two academic centers (University Hospital of Ferrara and Padua) were retrospectively analyzed. A total of 11 cases of parotid metastatic cancers from distant primary tumors have been identified. Patients with a primary Head and Neck cancer have been excluded from this study.

For each identified case, the medical history, side, surgery, histology and origin of the primary cancer have been collected. Ultrasound, fine-needle aspiration cytology (FNAC), ultrasound-guided core biopsy, CT and MRI have been performed in most cases.

Staging prior to surgery included neck ultrasound examination, thyroid and salivary glands assessment in all patients. Contrast-enhanced CT scans or MRI have been performed in some cases.

Surgical treatment options were incisional biopsy, superficial parotidectomy, total parotidectomy even with facial nerve sacrifice in one case.

Postoperative histopathological examination was performed in every case. Re-staging in relation to the primary tumor was then necessary, as it was clear that the nature of the parotid lesion was metastatic.

Results

Of the 11 diagnosed cases with parotid metastasis, 7 were males and 4 females. The average age at diagnosis was 66 years (range 55-85). The 11 cases were divided in three subgroups: (i) the first in which parotid metastasis was the first clinical manifestation of an unknown primary distant tumor; (ii) the second in which the parotid tumor was a metastatic localization of a known distant malignant tumor (histopathology confirmed the metastatic nature of the parotid lesion); (iii) the third group in which the parotid tumor represented recurrence of a previously treated tumor (Table 1).

The first group included 6 cases: 5 had pulmonary primary carcinoma and 1 pancreatic adenocarcinoma. Within the 5 cases of lung cancer, case no.9 and case no.10 had a particular history. Case no. 9 had a previous history of non Hodgkin lymphoma that occurred 10 years ago, and was evaluated due to the presence of neck nodes' swelling and a parotid mass. The patient underwent a parotid biopsy and histology revealed lung carcinoma; no surgical intervention to the parotid gland was attempted due to the poor patient's clinical condition. An atypical onset of disease was also present in case no.10: the patient developed a sudden parotid swelling, cytology revealed the presence of malignant cells and a total parotidectomy was performed: the final histological examination revealed a lung adenocarcinoma. In the other 4 cases a total parotidectomy was performed owing to clinical and cytological suspicion of a parotid primary malignant tumor; however the final histological examination revealed an origin different from the parotid.

In the second group, there were 2 cases (no.6 and no.11): both patients were treated for a lung cancer by radio and chemotherapy, however they developed a parotid swelling, and the cytological examination confirmed the presence of lung carcinoma metastasis in both cases. Case no. 6 was treated by total parotidectomy. Case no. 11 suffered an uncontrolled metastatic lung carcinoma complicated also with cerebral metastases.

In the third group these were 3 cases. All these patients were previously treated for primary tumors, and the parotid lesions represented recurrences of the previously treated tumors. In all cases there was no evidence of recurrence at the primary tumor site and the parotid lesions represented distant metastases. Metastases occurred

Table 1. Patient demographics, histology and treatment data

Patient number	Age (years)/Sex	Site of primary tumor	Histology	Parotid management	Group
1	58 F	Lung	SCLC	TP	1
2	58 M	Lung	SCC	TP	1
3	70 M	Lung	SCLC	TP	1
4	63 M	Pancreas	Adenocarcinoma	TP	1
5	55 F	Breast	Adenocarcinoma	TP	3
6	82 M	Lung	Basaloid SCC	TP	2
7	65 M	Stomach	Adenocarcinoma	SP	3
8	73 F	Lung	Neuroendocrine	TP + FN+ FND	3
9	52 M	Lung	Large cell carcinoma	OB	1
10	75 F	Lung	Adenocarcinoma	OB + TP	1
11	61 M	Lung	Adenocarcinoma	FNAC	2

TP: total parotidectomy, FN: facial nerve sacrifice, OB: open biopsy, FND: functional neck dissection, M: male, F: female, SP: superficial parotidectomy, SCC: squamous cell carcinoma, SCLC: small cell lung cancer, FNAC: fine needle aspiration cytology

after 12 months from the first tumor diagnosis in case no. 8, after 18 months in case no. 7 and after 16 months in case no. 5. Therefore, considering all the studied patients (Table 1), total parotidectomy was performed in 8 cases with facial nerve sacrifice and functional neck dissection in one case. Case no.7 was treated with superficial parotidectomy. One case (no.9) underwent open biopsy alone as the clinical condition did not allow a total parotidectomy under general anesthesia. Finally, case no.11 underwent diagnostic cytology due to the presence of cerebral metastasis.

The concordance between the preoperative FNAC and the final histology was of 63.6% (7 of 11 patients).

All patients died between 1 and 23 months from the diagnosis of metastatic disease; no specific statistical analysis was performed for overall survival, due to the histological heterogeneity of the group.

Discussion

Metastatic tumors to the parotid gland are uncommon. The vast majority of primary tumors giving metastases to the parotid gland are usually located in the head and neck region; metastatic localizations from distant primary tumors are even more rare.

Primary tumors outside the head and neck region may give metastases to the parotid gland or its nodes (oncologically, there is no distinction between metastases located in the parotid parenchyma and metastases in parotid lymph nodes) [7] through the thoracic duct or the Batson's paraspinous venous plexus, bypassing pulmonary vascular filtration [14,15]. The route of haematogenous metastasis is much less defined: Seifert et al. postulate that metastases in the parotid lymph nodes may be an expression of lymphatic metastasis, whereas the diagnosis of a parenchymal metastasis is an indication for haematogenous metastasis [7].

Clinically, parotid metastatic lesions often appear as soft swellings, without involving the skin or producing facial nerve palsy. The diagnostic work-up include echography, cyto/histo-pathologic assessment, CT and MRI. In the last years, PET-CT is also becoming a relevant tool in the study of metastatic disease and in the search of the primary site.

In recent reports, the sensitivity of parotid FNAC in the diagnosis of malignancy has been reported to be in the range of 54-92%, with specificity in the range of 86-100%. The false-negative rate ranges from 2 to 31% and the false-positive rate from 0 to 7% [16,17].

A reported alternative to FNAC is ultrasound-guided biopsy or an open biopsy [18]; these need local anaesthesia and a small skin incision compared to FNAC. A needle (usually 18 or 20G) is deployed by means of a spring-loaded automated biopsy device to obtain a core of intact tissue.

CT and MRI are used both as preoperative examinations and could be very helpful in evaluating and detecting the nature of a parotid mass. Parameters such as site and number of lesions, overall morphology, size, margins, extraglandular infiltrative growth pattern, perineural spread, presence of cervical adenopathy, radiological enhancement of lesions, diffusion weighted sequences, all are able to increase the specificity up to 0.96 and the sensitivity up to 0.88 in the differential diagnosis between benign and malignant lesions [19].

However, secondary metastatic localizations to the parotid gland are still often diagnosed by their histological features [2], as in our clinical series: 9 patients discovered their primary tumor only after the surgical procedure.

There is no international consensus about the treatment of parotid metastasis so far, and the agreement of a standard consensus management of parotid metastasis is a difficult challenge due to the complexity of the variables that affect patient survival. Some authors suggest parotidectomy with negative margins and with preservation of the facial nerve when possible in single parotid metastasis.

Shi et al. [20] for example, advocate even an ipsilateral neck dissection when the spread occurred predominantly via the lymphatic system, whereas, in cases of haematogenous spread from distant sites, neck dissection is thought to be unnecessary. Other authors consider that parotid surgery does not improve life expectancy, since the prognosis of such patients is poor with a 5-year survival rate of only 10% and the only place that parotid surgery could find is symptoms' control [21].

It has also been reported that in skin cancers (squamous cell carcinoma and melanoma), the presence of parotid and neck nodal metastases implies more aggressive disease with poorer prognosis. Surgical management of the parotid and eventually the neck nodes combined with radiation therapy remains the mainstay for the local (parotid) control, but without improvement of prognosis [15].

In case of metastasis from lung cancers, treatment of metastatic parotid lesions is advocated with the only aim of locoregional control. In particular, Bumpous et al. suggest a combination of surgery and adjuvant irradiation [6]; Jecker et al.

reported that radical parotid surgery had poor effect in improving the life expectancy and concluded that all the current therapeutic procedures are ineffective [21].

In conclusion, there is still no international consensus about the therapy of parotid malignant metastasis, and the overall prognosis of this disease remains very poor.

Acknowledgements

The authors thank Mrs Frances Coburn for her help in revising the English text.

Conflict of interests

The authors declare no conflict of interests.

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