Auris Nasus Larynx xxx (2015) xxx–xxx

Contents lists available at ScienceDirect

Auris Nasus Larynx

journal homepage: www.elsevier.com/locate/anl

# Parotid gland metastases of distant primary tumours: A diagnostic challenge

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ARTICLE INFO

*Article history:*
Received 9 April 2015
Accepted 30 September 2015
Available online xxx

*Keywords:*
Parotid neoplasms
Metastasis
Differential diagnosis
Therapy

ABSTRACT

*Objective:* Metastatic disease is common among parotid malignancies. The majority of primary tumours are located in the head and neck, but primary tumours below the clavicle must also be considered, especially in histological types not usually found in primary parotid or skin tumours.
*Methods:* We performed 644 consecutive parotidectomies between 1980 and 2012. Benign tumours were found in 555 patients (86%) and malignant tumours in 89 patients (14%).
*Results:* Of 89 malignant tumours, 39 were metastases (44%). In 5 cases, the primary tumour was located below the clavicle (6% of malignant tumours). A carcinoma of the bronchus was subsequently diagnosed in three patients: one patient had breast carcinoma and one renal cell carcinoma.
*Conclusion:* The majority of metastases in the parotid gland arise from primary tumours of the head and neck. In 10–20% of metastases, the primary tumour arises below the clavicle. Parotid metastases can be the first clinical manifestation of a malignant tumour, and can also occur years after curative intent treatment. Histopathology and immunohistochemistry will offer clues to a possible metastatic process and to primary tumour location. Parotidectomy with complete excision of the tumour can be a curative measure or form an essential part of symptom control and should be considered in all but the most moribund patients.


## 1. Objective

Malignant tumours of the parotid gland show great variety of histological types; they include epithelial and non-epithelial neoplasm of the parotid; in addition to this, the parotid gland is frequently affected by metastasis through the lymphogenic and haematogenic routes. Metastases usually arise from primary tumours of the head and neck, with primaries of the skin of the head and neck the most common type of primary tumour. Metastasis from primary tumours below the clavicle is less common [1]. We present five cases which metastasised into the parotid gland from a tumour located below the clavicle, out of a group of 644 parotidectomy patients, and discuss the diagnostic challenges, differential diagnoses to consider as well as management, considering previously published series and changes in management of parotid tumours.

## 2. Patients and methods

We retrospectively examined 644 consecutive cases of parotidectomy. All procedures were performed by the same Consultant Head and Neck Surgeon in a Head and Neck unit at a university teaching hospital between 1980 and 2012. Either total conservative parotidectomy with facial nerve preservation where possible or superficial parotidectomy was performed. In cases where the tumour infiltrated the facial nerve, the facial

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http://dx.doi.org/10.1016/j.anl.2015.09.010
0385-8146/

nerve was sacrificed. Neck dissections were not performed contemporaneously. Postoperative histopathology examination was performed in-house with samples being sent to reference laboratories where appropriate.

Staging examinations prior to surgery included an ultrasound examination of the neck, thyroid and salivary glands in all patients. In some cases, a computed tomography of the neck thorax would be performed prior to surgery. Re-staging procedures were tailored to the primary tumour and would always include an ultrasound examination of the neck and abdomen. In some cases, computed tomography of the abdomen and the thorax, a bronchoscopy and mammogram would be performed. All patient data were obtained by hand searching of patient records. Data were maintained in an anonymised database and analysed using a statistical software package.

### 2.1. Ethical considerations

In this retrospective chart review series, where study subjects are anonymised and cannot be identified, federal state ethics approval was not required. All investigations and treatments were carried out according to accepted clinical practice and compliant with the medical principles of the Declaration of Helsinki and German federal law. Written consent was obtained prior to surgery and prior to reporting cases to the state tumour registry.

## 3. Results

We operated on 644 consecutive patients with a parotid tumour. A benign tumour was found in 555 patients (86%), and 89 patients (14%) had a malignant tumour. Metastases of a primary tumour located outside the parotid gland were diagnosed in 39 patients or 44% of all malignant lesions. The majority of primary tumours were located in the head and neck. 26 patients, or 67% of all patients with metastatic lesions, had a primary squamous cell carcinoma of the skin. Other types of malignant skin tumours were not found in our patients. An infraclavicular tumour was found to be the origin of parotid metastasis in 5 patients. In all five cases, the metastatic lesion infiltrated the parenchyma of the parotid gland. This accounts for 13% of all metastatic, 6% of all malignant and 0.8% of all parotid lesions examined. Three patients were female and two patients male. Three patients had a carcinoma of the bronchus as their primary tumour, one had a carcinoma of the breast and one had a renal cell carcinoma (Table 1).

The cases in detail are:

**Patient 1**: A 62-year-old male presented with a rapidly growing painless swelling at the left angle of mandible. He had been a smoker of 10–20 cigarettes per day for over 40 years; medical history was unremarkable. The swelling represented a mobile intraparotid tumour of approximately 1.5 cm in diameter. On ultrasound it appeared hypoechoic and with smooth borders. Histology following subtotal parotidectomy revealed an intraparotid lymph node infiltrated by a partially small cell, partially undifferentiated carcinoma, which was typed as a neuroendocrine tumour by immunohistochemistry. Further staging investigations by computed tomography (CT) and bronchoscopy identified a small cell carcinoma of the left upper lobe bronchus to be the primary tumour, with further metastases found in the mediastinum. Interestingly, a previous chest radiograph done 4 weeks pre-operatively showed only a mild widening of the mediastinum but no definite lesions. The patient received chemoradiotherapy targeted at lung and mediastinum but died seven months after diagnosis from tumour-related illness.

**Patient 2**: A 72-year-old female presented with a four-week history of left painless pre-auricular swelling. She was noted to be cachectic and generally unwell looking. A tough lump was

**Table 1**
Patients from our series with a parotid metastasis of an infraclavicular tumour (A) and origin of all parotid tumours (B). All patients underwent total conservative parotidectomy with facial nerve preservation.

| | Demographics | Histology | Primary | Years since primary tumour | Other tumour manifestations | Additional therapy |
|---|---|---|---|---|---|---|
| **A. Patients with parotid metastasis form infraclavicular tumour** | | | | | | |
| 1 | Male 62 years | Small cell carcinoma | Bronchus | 0 | Mediastinum | Chemotherapy, cancer-related death 7 months after diagnosis |
| 2 | Female 72 years | Small cell carcinoma | Bronchus | 0 | Disseminated | Chemoradiotherapy, cancer-related death 6 months after diagnosis |
| 3 | Male 71 years | Squamous cell carcinoma | Bronchus | 0 | None | Chemoradiotherapy, in complete remission at 1 year after diagnosis |
| 4 | Female 74 years | Renal cell carcinoma | Kidney | 6 | None | None |
| 5 | Female 69 years | Adenocarcinoma | Breast | 9 | None | None. Lung metastasis at one year and cancer-related death 18 months after parotidectomy |

| Number of patients | Histology | Primary |
|---|---|---|
| **B. Summary of patients with parotid metastasis from other locations** | | |
| 26 | Squamous cell carcinoma | Skin of Head and Neck |
| 8 | Squamous cell carcinoma | Oropharynx and Larynx |

Please cite this article in press as: Franzen AM, et al. Parotid gland metastases of distant primary tumours: A diagnostic challenge. Auris Nasus Larynx (2015), http://dx.doi.org/10.1016/j.anl.2015.09.010