

Metastatic breast carcinoma in the parapharyngeal space

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Abstract

The parapharyngeal space is a complex anatomical area, which can give rise to a variety of both primary and metastatic neoplasms. We present an unusual case of metastatic adenocarcinoma of the breast, masquerading as a deep lobe parotid neoplasm, 15 years after the primary presentation. Metastatic breast carcinoma has been previously reported at other sites in the head and neck but this is the first report of metastases in the parapharyngeal space with an oropharyngeal presentation.

Key words: Breast Neoplasms; Neoplasm Metastasis; Pharynx

Introduction

Parapharyngeal tumours account for 0.5 per cent of all head and neck neoplasms.¹ Nearly half of all parapharyngeal space masses are of salivary origin, primarily representing benign pleomorphic adenomas arising from the deep lobe of the parotid, followed in frequency by paragangliomas and neurogenic tumours. Metastatic tumours in the parapharyngeal space are usually of squamous cell origin from head and neck primaries, although isolated reports of metastatic thyroid carcinoma have been reported in the literature.^{2–4} Metastatic breast carcinoma in the head and neck has been reported at various different sites including the larynx, nose, sinonasal tract, nasopharynx and the temporal bone.^{5–8} However intra-oral presentation as a parapharyngeal mass has not been reported in the world literature.

Case report

A 63-year-old lady presented to ENT casualty with a six-month history of a 'sensation of something stuck in her

throat' recently associated with a painless swelling inside the left side of her oral cavity. There was no history of dysphagia, dyspnoea, hoarseness, loss of appetite or weight, masses in the neck or elsewhere in the body. There was no history of oral bleeding, pain, epistaxis or nasal symptoms. Relevant past history included a left partial mastectomy with axillary node sampling in 1985, that revealed infiltrating ductal carcinoma of the breast. Subsequently the patient also required a left simple mastectomy in 1986 and six separate operations for



FIG. 1

Clinical photograph with mouth open showing left sided intra-oral mass.

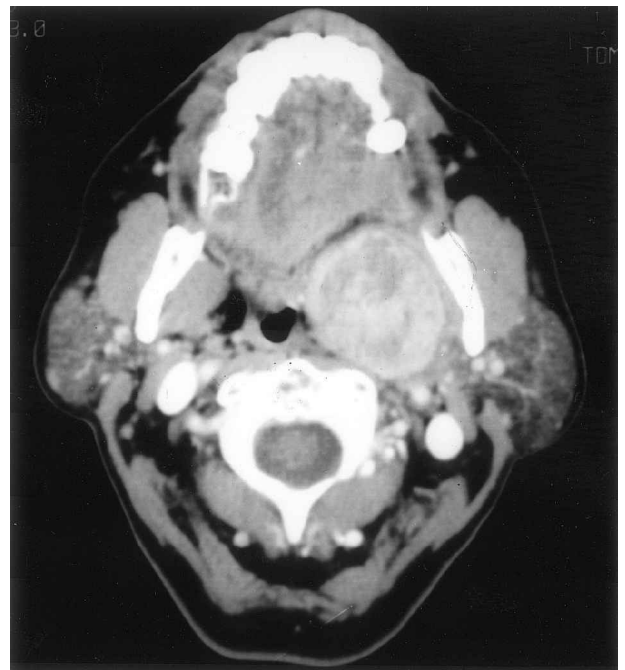


FIG. 2

CT scan with contrast showing a well-defined enhanced mass in the left parapharyngeal space.

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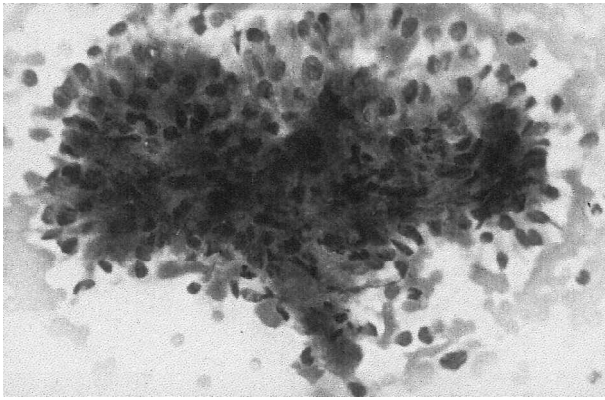


FIG. 3

Cytology microphotograph showing clusters of plasmacytoid cells with some extracellular matrix material (Giesma; $\times 250$).

excision of local recurrences, the last of which in 1996 showed infiltration into the muscles of the chest wall. Staging investigations such as isotope bone scan, chest X-ray and ultrasound abdomen until recently, had all been negative. During the course of her treatment, the patient had undergone radiotherapy, and was on long-term treatment with tamoxifen, megestrol acetate and anastrozole.

On examination, an intra-oral mass was seen occupying the left side of the oropharynx behind the left soft palate and filling the left post-nasal space. The soft palate was pushed medially and the mass was firm on palpation (Figure 1). The rest of the ENT examination was normal. Neck examination did not reveal any obvious lymphadenopathy. A computed tomography (CT) scan of the head and neck revealed a well-defined large enhancing mass (3.5 cm \times 3 cm) in the left parapharyngeal space extending from the pterygoid plate to the angle of the mandible inferiorly (Figure 2). The clinical impression was a deep lobe parotid tumour in the parapharyngeal space, most likely a pleomorphic adenoma. Intra-oral fine needle aspiration cytology showed squamous metaplasia in areas suggesting possibilities of it being a mucoepidermoid carcinoma, carcinoma ex pleomorphic salivary adenoma or a malignant mixed tumour (Figure 3).

At surgery, after a mandibulotomy to gain access, an intra-oral frozen section biopsy was carried out which suggested metastatic breast carcinoma following which the patient underwent a total resection of the left para-

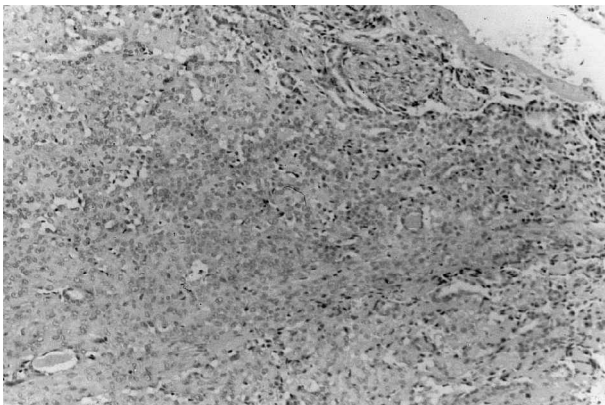


FIG. 4a

Microphotograph showing typical histological features of metastatic breast adenocarcinoma (H & E; $\times 40$)

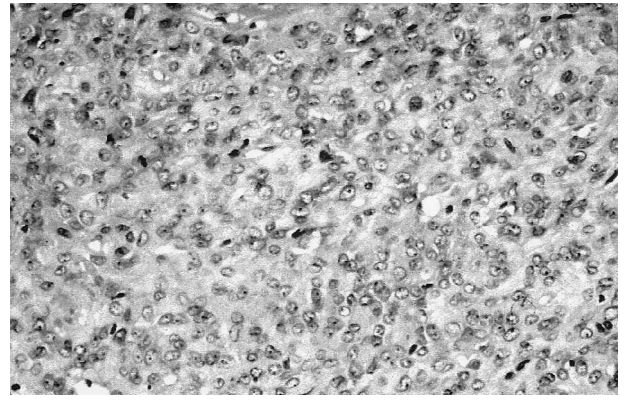


FIG. 4b

Histology microphotograph (H & E; $\times 250$).

pharyngeal tumour. Histopathology confirmed metastatic soft tissue adenocarcinoma in keeping with recurrence of her primary breast carcinoma (Figures 4a & b). Squamous metaplasia was not identified in the sections examined histologically as suggested by the fine needle biopsy. Post-operative recovery was uneventful and in view of the histology, the patient has undergone further chemotherapy. A 12-month review has not revealed any evidence of recurrence.

Discussion

Metastatic neoplasms from infraclavicular sites to the head and neck are unusual. Although metastases have been reported from a variety of sites, tumours of the genitourinary tract, breast and lung are among the more common primary sites.⁹ The sinonasal tract is the most common site of secondary disease in the head and neck from infraclavicular locations.⁹ Renal cell carcinoma, which accounts for more than 50 per cent of the cases, is the most common primary site followed by breast carcinoma.¹⁰

Metastases from infraclavicular sites may occur by haematogenous or lymphogenous routes. Several possible routes for metastasis have been proposed. Increase in intra-abdominal or intrathoracic pressure propels tumour emboli into the circulation passing through the valveless veins of Batson's vertebral plexus to end in the head and neck, bypassing the pulmonary circulation. Metastases may also reach the head and neck through the systemic circulation either by way of the inferior vena cava, bypassing the pulmonary filter, or from release of tumour emboli from established pulmonary foci.^{6,11} In the present case, haematogenous spread seems to be the most likely cause with the patient having had multiple local metastases, that necessitated multiple surgical interventions. Repeated surgery and recurrent tumour growth is associated with neo-vascularization which provides pathways for the distant spread of the tumour.

The latent period from the initial primary to the metastasis varies amongst individual cases. In the case cited above, it has taken 15 years for the primary breast cancer to manifest in the parapharyngeal space. The variability in the latent period in breast carcinoma can be explained by clinical studies, that demonstrate a period of dormancy amongst tumour cells followed by a rapid growth during relapse.¹²⁻¹⁴ Thus, a dormant tumour population remains clinically undetectable for months or years and consequently poses a continuous risk of recurrence. Various mechanisms including hormonal, immune, and cell cycle effects have been proposed to

explain this phenomenon. All these mechanisms assume that within a dormant tumour, the neoplastic cells are not dividing. Holmgren *et al.*¹⁵ and Murray¹⁶ have shown that metastases remain dormant when tumour cell proliferation is balanced by an equivalent rate of cell death and that angiogenesis inhibitors control metastatic growth by indirectly increasing apoptosis (programmed cell death) of tumour cells.

The signs and symptoms of metastatic disease to the head and neck may be non-specific. Clinical manifestations can mimic primary neoplastic or inflammatory disease. In the case cited above, an intra-oral presentation with a long-standing history prompted us to a clinical diagnosis of a deep lobe parotid tumour. Radiographic findings are frequently not characteristic, although CT and magnetic resonance imaging (MRI) may be helpful in defining location, extent, and presence or absence of bony destruction. Differentiation of parapharyngeal tumours from masses in the deep lobe of the parotid relies on detection of fat planes and displacement of vascular structures.¹⁷ This feature does not apply when the mass is large enough to efface the fat planes necessary to make the distinction.¹⁸

Malignant tumours of the breast, kidney and lung, that can metastasize to the head and neck, may show histological features that are similar to those of primary tumours of the parotid region.¹⁹ However, after review of the slides from the primary breast tumour and local recurrences, the histological features of this latest biopsy were seen to be identical to the original tumour, confirming the diagnosis of metastatic breast carcinoma, rather than a co-incident primary salivary gland tumour.

Metastatic breast carcinoma to the head and neck is associated with a poor prognosis because the primary disease is usually advanced and widespread by the time secondary disease manifests clinically.^{11,20} However, long-term survivors have been reported in cases metastatic to the larynx and sinuses.^{21,22} Curative surgical resection followed by post-operative chemotherapy is the preferred option in cases of a solitary metastasis provided a complete metastatic workup has ruled out evidence of other systemic metastases.⁸

Conclusion

High index of suspicion, thorough review of systems, detailed past medical history, complete physical examination, radiology and fine needle aspiration cytology are the key to diagnosis of metastatic disease to the head and neck. Early recognition of metastatic disease to the head and neck improves survival, minimizes the number of invasive procedures necessary, prevents inappropriate therapy and optimizes palliation.

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