



# Metastasis of Renal Cell Carcinoma to the Head and Neck: Report of Three Cases and Literature Review

Deng Gao LIU<sup>1</sup>, Xu Chen MA<sup>1</sup>, Chuan Bin GUO<sup>2</sup>, Fu Yun ZHAO<sup>2</sup>, Hai Yan LUO<sup>3</sup>

**Abstract:** Renal cell carcinoma (RCC) is the third most frequent infraclavicular tumour to metastasise to the extracranial region of the head and neck. Metastasis occurs in about 15% of patients with RCC, but only 1% of the patients have metastasis confined to the head and neck. This paper reports three cases of RCC with metastases to the unilateral parotid, the bilateral parotid and the paranasal sinuses. The clinical behaviour and radiographic appearance are reviewed, and the treatment options are also discussed.

**Key words:** renal cell carcinoma, metastasis, head and neck

Metastasis of renal cell carcinoma (RCC) to the head and neck region is not often encountered by oral and maxillofacial surgeons, although it is the third most frequent infraclavicular tumour to metastasise to the head and neck, following breast and lung carcinoma<sup>1</sup>. Only 1% of the patients with RCC have metastasis confined to the head and neck<sup>1,2</sup>. From 1986 to 2006, there were three RCC patients with metastases to the unilateral parotid, the bilateral parotid, and the paranasal sinuses treated in the Department of Oral and Maxillofacial Surgery, Peking University Hospital of Stomatology.

Here, we report the clinical behaviour, radiographic appearance and treatment options of the three cases, and discuss a literature review.

## Report of Cases

### Case 1

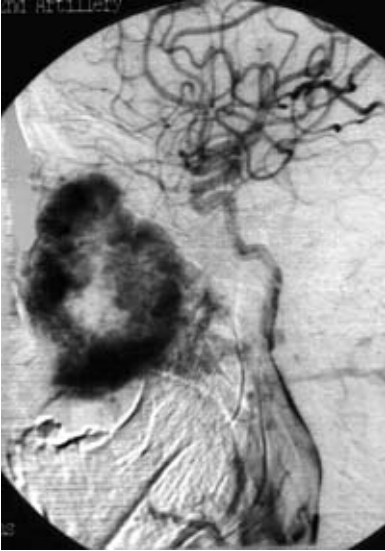
A 64-year-old man presented to the Department of Oral and Maxillofacial Surgery in July 1993 with a chief complaint of a slowly enlarging mass in the right parotid. The mass had been present for 1 year without pain. His past medical history included a left nephrectomy for renal carcinoma 5 years before. Physical examination revealed a 4 cm \* 3 cm, well-defined non-tender mass in the inferior pole of the right parotid. The facial nerve was not involved. His admission laboratory values, electrocardiograph and chest radiograph were uneventful. A superficial parotidectomy was performed with preservation of the facial nerve. The pathohistology appeared as nests with clear, watery cytoplasm, compact eosinophilic peripheral cell membranes and small hyperchromatic nuclei. Therefore, it was diagnosed as metastasised acinic cell carcinoma. The patient was referred to a medical centre for further radiotherapy.

1 Department of Oral & Maxillofacial Radiology, Peking University School and Hospital of Stomatology, Beijing, P.R. China.

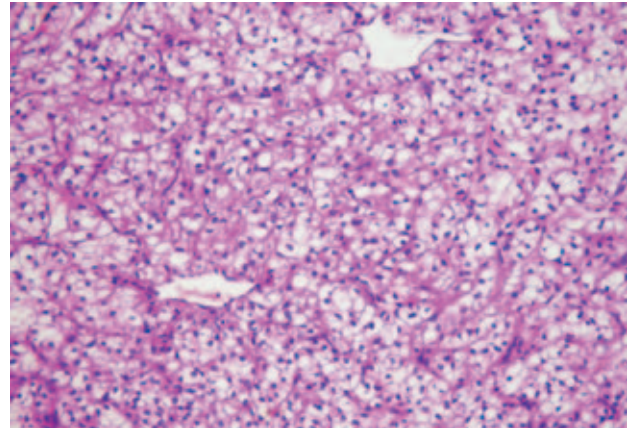
2 Department of Oral & Maxillofacial Surgery, Peking University School and Hospital of Stomatology, Beijing, P.R. China

3 Department of Oral Pathology, Peking University School and Hospital of Stomatology, Beijing, P.R. China.

**Corresponding author:** Dr Deng Gao LIU, Department of Oral & Maxillofacial Radiology, Peking University School and Hospital of Stomatology, #22 Zhongguancun Nandajie, Haidian District, Beijing 100081, P.R. China. Tel: 86-10-62179977 ext 2327; Fax: 86-10-62173402. E-mail: kqldg@bjmu.edu.cn



**Fig 1** Lateral view of right carotid arteriography revealed a huge vascular mass in the para-nasal region.



**Fig 2** Photomicrograph of the paranasal sinus mass showed a lesion composed of nests of cells with clear watery cytoplasm and small hyperchromatic nuclei (haematoxylin and eosin, \*200).

However, in November 1998, the patient presented again for a slowly enlarging mass in the left parotid. The mass was firm, non-mobile and ill-defined. The left facial nerve was intact. A computerised tomography (CT) scan showed an ill-defined enhancing mass in the left parotid, measuring about 4 cm \* 5 cm. The patient's general condition was uneventful. A superficial parotidectomy was carried out again; in the operation, the mass was found to be a highly vascular tumour and had already invaded the main stem of the facial nerve. However, the facial nerve was preserved. The pathohistological appearance of the mass was the same as that shown in right parotid 5 years ago. Therefore, the final diagnosis was bilateral parotid metastases of RCC. The patient was then referred for further radiotherapy and chemotherapy. The patient died of pancreas metastasis 10 months later and no local recurrence was found before his death.

### Case 2

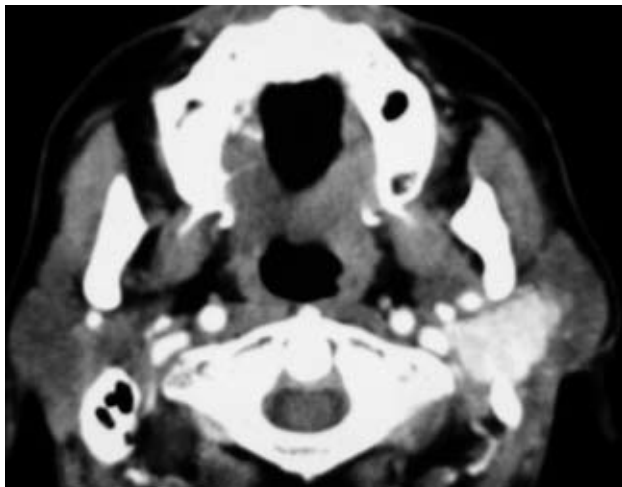
A 76-year-old man presented to the hospital in March 2002 with a chief complaint of right palatal mass and ipsilateral nasal obstruction for 5 months. His past medical history included radical nephrectomy for a left-side renal cell carcinoma in 1991. His admission laboratory values and chest radiograph were uneventful. A CT scan showed that a bulky mass occupied the right maxillary sinus, and extended into the right nasal cavity and ethmoid sinus. The palatal mass was pulsatile on palpation and bled profusely after needle biopsy, so that an angiographic examination was performed. Angiography

demonstrated a large highly vascular mass in the paranasal region (Fig 1). The feeding arteries to the tumour were successfully embolised with polyvinyl alcohol (PVA) particles. Radical maxillectomy was performed, with 900 ml of intraoperative blood loss. The pathohistological diagnosis of the tumour was metastatic RCC (Fig 2).

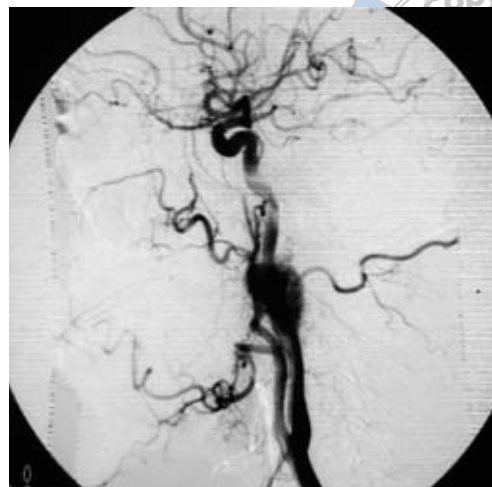
In February 2003, the patient presented to the hospital again with a recurrent mass in the maxilla region and intermittent bleeding. A CT scan showed the recurrent mass extended from the remnant maxilla to the right ethmoid sinus. The recurrent tumour again showed high vascularity on angiogram and then was completely embolised with PVA and Gelfoam. The patient refused further operation for radical resection of the tumour. After a short period of regression, the tumour enlarged and bled intermittently, and the general condition became worse. The patient died 13 months later.

### Case 3

A 65-year-old man presented to the hospital in August 2005 with the chief complaint of a painless mass in the left preauricular region for 2 months. His past medical history included a left nephrectomy for RCC in November 2001. By physical examination, the tumour showed movable and non-tender, and the facial nerve and overlying skin were not involved. Regional parotidectomy was performed, and the mass was highly vascular and ill-defined. However, pathohistology failed to find any tumour cells, just parotid gland tissue with features for



**Fig 3** Axial view of a CT scan revealed a left parotid mass, which was located mainly in the deep lobe and homogeneously enhanced.



**Fig 4** Lateral view of left carotid arteriography showing a densely stained mass in the parotid region.

chronic parotitis. In June 2006, the patient presented to the hospital again with a recurrent mass in the same region of the left parotid. The tumour had slowly enlarged in the past 3 months with mild pain. On palpation, the pre-auricular mass was slightly pulsatile and tender. A CT scan revealed a solid mass involving mainly the deep lobe of the left parotid. The mass was intensely and homogeneously enhanced with contrast agent (Fig 3). Angiographic examination further demonstrated a highly vascular tumour in the parotid region (Fig 4). The tumour was completely embolised with Gelfoam particles. Positron emission tomography with fluorine-18 fluorodeoxyglucose (FDG) revealed an increased FDG uptake in the left parotid region, suggesting RCC metastatic tumour. Parotidectomy was performed with preservation of the facial nerve. Since the pathohistological appearance of the tumour was strikingly similar to his primary RCC, it was diagnosed as RCC metastasis. The patient further received iodine-125 brachytherapy 1 month after surgery and was followed-up for 6 months with no signs of local recurrence.

### Discussion

RCC (hypernephroma) is the most common malignant tumour of the kidney, and more than 80% of RCCs are of clear cell type<sup>3</sup>. Approximately 14–16% of the patients with RCC have extracranial head and neck metastases. Only 1% of the patients with RCC have metastasis confined only to the head and neck<sup>1,2</sup>. It has been

noted that the clinical behaviour is often unpredictable in its rate of growth, in the timing of metastases, and in the patterns of metastatic spread. Some hypernephromas regress spontaneously, whereas some metastasize many years after a curative resection of the primary lesion as seen in case 2<sup>1–3</sup>.

RCC is the most frequent infraclavicular metastatic tumour in the nasal cavity and paranasal sinuses. Case 2 of this report had nasal obstruction and pulsatile mass in the palate. Angiography showed the highly vascular nature. Though nonspecific, the vascular nature, the destruction and lack of tumour calcification should suggest metastatic RCC as a part of the differential diagnosis<sup>1,2,4</sup>.

The commonest lesions to metastasize to the parotid are melanoma or squamous cell carcinoma of the head and neck<sup>5,6</sup>. Metastases from distant sites, such as the lung, breast, kidney, colon and rectum, represent from 0.16 to 4% of all parotid tumors<sup>7,8</sup>. In a review of English literature, Park and Hlivko<sup>9</sup> identified 25 cases of RCC metastasis to the parotid gland. We could identify six other cases with metastatic RCC in the parotid gland in a recent review of English literature<sup>5,8,10–12</sup>. In our cases, the parotid metastases appeared 4–5 years after curative treatment of the primary lesion. Therefore, unless one recognizes the unpredictable behaviour of RCC and keeps in mind a high index of suspicion, such metastasis of RCC to the head and neck region may be completely overlooked. Bilateral parotid gland metastasis of RCC is so rare that, to our knowledge, there are only two

cases reported so far in the literature<sup>9</sup>. Therefore, case 1 in our report is probably the third one with evidence of bilateral spread of RCC to the parotid gland.

The commonest presenting complaint of a parotid RCC metastasis was a movable parotid mass, with some patients having pain and tenderness<sup>9</sup>. There was only one case that presented with facial palsy<sup>5</sup>. In our report, the left parotid mass in case 1 was non-movable, ill-defined, and slightly tender on palpation. The recurrent parotid mass in case 3 was pulsatile and tender. In both cases, the highly vascular nature of the mass was confirmed by several imaging modalities. These appearances of imaging were nonspecific, and could only be referred to melanoma, lymphoma, paraganglioma, meningioma, haemangiopericytoma and haemangi endothelioma, etc. Therefore, final diagnosis still depends on the pathology. In fact, if the pathologist has not suggested the possibility of metastasis of RCC, then confusion with the primary RCC tumours may occur (as in case 1)<sup>2</sup>. The use of a special study, such as a periodic acid–Schiff test and enzymes (such as diastase), is helpful in distinguishing primary parotid tumours such as acinic cell and mucoepidermoid carcinoma from RCC<sup>9,13</sup>. Immunohistochemical studies can aid in the histological differentiation. Immunoperoxidase staining characteristics of keratin and vimentin positivity, as well as carcinoembryonic antigen negativity, support the diagnosis of RCC<sup>8,9</sup>.

The role of surgery for metastatic lesions of RCC has been questioned. Some believed that metastatic lesions of RCC should not be excised<sup>1,3</sup>. Gottlieb and Roland<sup>3</sup> and Pritchky et al<sup>1</sup> believed that head and neck metastases were likely to lead to severe disfigurement, airway compromise, bleeding, loss of vision and other catastrophic occurrences. Local resection, with preservation of vital structure, should be considered as a choice of treatment and might improve quality of life and provide a chance for cure in the head and neck<sup>9</sup>. Based on the vascularity and propensity for bleeding, intra-arterial embolisation should be employed to prevent massive haemorrhage during the excision.

RCC is traditionally described as a radioresistant tumour, but studies have reported the effectiveness of radiotherapy in the treatment of metastatic lesions. The

response to radiotherapy seems site specific, with bone and soft tissue metastasis showing the best response rate<sup>1,4</sup>. The patient in case 1 in our report received post-operative radiotherapy and no local recurrence was found before his death. The patient in case 3 received brachytherapy and was still under follow-up. Had the patient in case 2 received radiotherapy, his local control of the recurrent tumour would have been improved.

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