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Intramasseteric metastasis of renal cell carcinoma

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Abstract
In this case report, we present a solitary metastasis of renal cell carcinoma inside the masseter muscle. To our knowledge, it is the very first case ever encountered.

Key words: Carcinoma, Renal Cell; Neoplasm Metastasis; Masseter Muscle

Introduction

Although distant solitary metastases from renal cell carcinoma are not uncommon, the appearance of metastatic lesions in the area of the head and neck is unusual. So far, there have been a limited number of such cases published in the international literature, mostly located in the parotid[1–3] or in the thyroid gland,[2,4,5] as well as in the paranasal sinuses[2,6] and in the orbit.[7]

Case report

A 60-year-old male presented to our clinic with a progressively enlarging painless left lateral facial mass for approximately four months. The mass was palpated just above the left angle of the mandible. It appeared hard in consistency, firmly attached to the underlying tissues, its size being 1.5 cm in diameter. There was no evidence of ongoing inflammatory process, such as pain or erythema. There were no other palpable findings in the head and neck region. The remaining otorhinolaryngological physical examination was free of pathological findings.

The patient reported a history of a Grade 2 renal cell adenocarinoma in the left kidney, for which he had undergone a left total nephrectomy six months ago. His pre-operative history consisted of painless gross haematuria for 20 days prior to his presenting to the Urology Clinic of the University of Athens Medical School. Clinical examination was negative for palpable flank masses. A plain abdominal film (KUB) was free of pathological findings. An abdominal computed tomography (CT) with iv and po contrast showed a homogenous mass located in the upper pole of the left kidney, its dimensions being approximately 5×5 cm and its margins being indistinct from the surrounding renal parenchyma. Intravenous pyelography showed calyceal splaying and overall marked distortion of the collecting system. At that time, the remaining pre-operative work-up consisting of full body CT and bone scan was negative for distant metastases. No evidence of facial or lateral neck mass was encountered at that time and during five-month follow-up. The post-operative histological assessment of the surgical specimen placed the diagnosis of a Grade II moderately differentiated adenocarcinoma of the left kidney.

Three months later, he reported a small painless lump just above the left angle of the mandible, but did not pay any attention to it. Due to its progressive enlargement and rigidity, he was worried and was referred to our clinic for further evaluation. A neck CT (Figure 1) revealed a solid mass above the mandibular angle, without clarifying whether it emanated from the parotid gland or from the masseter muscle. There was no evidence of mandibular erosion or cervical lymphadenopathy.

The patient underwent local exicision of the mass, that was found to be located inside the masseter muscle. In addition, a superficial parotidectomy was performed, due to the direct contact of the tail of the parotid gland to the mass. The facial nerve was identified, skeletonized and left intact. Frozen sections sent during the operation were positive for malignancy. The final post-operative pathology report revealed metastatic invasion of striated muscle from solid clear cell adenocarcinoma of the kidney. The patient

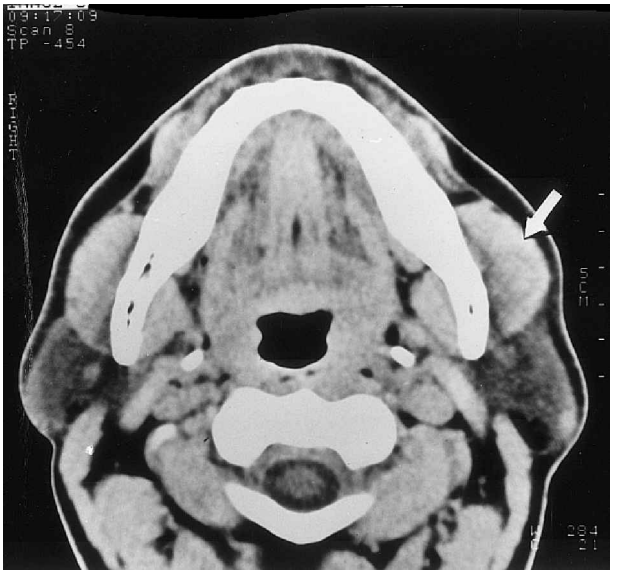

Fig. 1
Indistinct mass located in the left masseter muscle.

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had an uneventful post-operative hospital stay with adequate healing of the wound and was discharged in good condition. A combination of interleukin-2 and interferon-β was administered post-operatively for a period of three months. Up to the present, he has no further metastases.

Discussion

Renal cell carcinoma accounts for approximately 85 per cent of all primary renal neoplasms. It is known as "*internist's tumour*" because of its diverse and often obscure presenting signs and symptoms that challenge even the most astute diagnostician.

In 1993, its overall incidence was 7.5 cases/100,000 population, and it was estimated that there would be 25,000 newly diagnosed cases yearly. It is twice as common in males as in females.[8,9] It seems that renal cell carcinoma is more prevalent between Scandinavians and North Americans and less frequent in Asians and Africans. The incidence peaks between the ages of 50–70, although this malignancy can be diagnosed at any age. There appears to be a moderate association between the incidence of renal cell carcinoma and tobacco use,[10] as well as with a variety of chemicals and biological agents in animals. These substances include lead phosphate, demethylnitrosamine, prolonged administration of oestrogen, aflatoxin B, and streptozocin.[8,11–13]

Almost 25 per cent of patients with newly diagnosed renal cell carcinoma have evidence of metastases at presentation.[14] However, only approximately 15 per cent of patients with renal cell carcinoma have extracranial head and neck metastases.[15] Reports of distant metastases 17 years or more after excision of the primary lesion provide the feature of unpredictability in the metastatic spread of the tumour.[3]

Many theories concerning the pathway of metastatic spread to the head and neck have been postulated. A comparative examination of the most probable theories by Gottlieb and Roland[2] led to the conclusion that Batson's venous plexus, as described by Nahum and Bailey,[6] is most likely responsible for such an event. According to that theory, emboli from renal cell carcinoma could enter Batson's paraspinal venous plexus, travel up to the cranium through retrograde motion, and seed facial structures such as the paranasal sinuses, mandible, thyroid, larynx and parotid through combinations of anterograde and retrograde flow in an unusual pattern. The simultaneous existence of membrane and/or nuclear receptors to carcinogens and cell line promoters could additionally explain the appearance of solitary neck metastases.[2] That theory could similarly explain the intramasseteric solitary metastasis that was encountered in our case.

Opinions concerning excision of metastatic lesions of renal cell carcinoma are diverse. Patients who had undergone excision of solitary metastases following nephrectomy had a two-year and a five-year survival rate of 41 per cent and 13 per cent respectively, regardless of the interval between nephrectomy and diagnosis of metastatic lesion.[16] In contrast to the low biological aggressiveness of the tumour, which does not necessitate excision of metastatic lesions, it is believed that the sensitive and vital anatomical structures of the head and neck should not be left exposed to the compressive or erosive effects of the mass. It is, therefore, prudent to excise solitary metastatic lesions in the head and neck with careful preservation of all vital structures.[2] With these in mind, we decided to perform local excision of the tumour with careful preservation of the marginal mandibular branch of the facial nerve. Because of direct contact of the tail of the parotid with the mass, we decided to proceed to additional superficial parotidectomy.

The administration of adjuvant post-operative immunotherapy was proposed by Medical Oncology, based on recent studies which advocate the use of interleukin-2 (IL-2) either alone or in combination with interferons (IFN). In vitro studies have shown IFNs to be synergistic with IL-2 in stimulating NK cells' activity and increasing the expression of IL-2 receptors. Therefore, apart from the attraction of combining two agents that are known to be individually effective in renal cell carcinoma, there is reasonable scientific basis for using this combination. The regimen chosen for IL-2 treatment consisted of two five-day continuous intravenous infusions at a dose of 18×10^6 IU/m^2/day seperated by a rest period. Maintenance treatment began three weeks after the 2nd induction treatments and was given with up to four cycles of 18×10^6 IU/m^2/day for five days, repeated four-weekly. Recombinant IFN-β was simultaneously administered for a similar time pattern at a dosage of 20 MU three times weekly.

The use of radiotherapy in metastatic renal cell carcinoma has been controversial. Various reports document the inefficiency of its application[17] as a palliative method, as well as the lack of difference between its application and high doses of interleukin-2[18] in the treatment of metastatic renal cell carcinoma. Others support its application; nevertheless, this appears to be limited to bone meastases.[19] We, therefore, chose to avoid it, since the side-effects outweighed its limited efficacy.

Concluding, the existence of metastatic from renal cell carcinoma in the masseter muscle is a unique presentation of metastatic disease at a very distant site from its origin. Apart from being the very first of its kind, its presence stimulates the otorhinolaryngologist to recognize such an entity in patients with history of renal cell carcinoma.

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