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Pituitary gland metastases from renal cell carcinoma: A case report and literature update

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Abstract

Pituitary metastases are rare and metastatic pituitary lesions secondary of renal carcinoma are extremely rare. These lesions can be mistaken for pituitary adenomas and diagnosis can be very difficult. We report a 67-year-old Italian female complained of headache and visual impairment resulting from a sellar lesion with suprasellar extension. A transsphenoidal biopsy was performed and histological examination revealed a metastasis of renal cell carcinoma. Few casesof this type of pituitary metastasis is described and every treatment is palliative for the life of such patient. We updateliterature and discuss the clinical and radiological features and treatment of this case.

Abbreviations: CT: Computed Tomography, MRI: Magnetic Resonance

Introduction

Metastatic tumors involving the pituitary gland account for 1% of all pituitary tumor resections and for 1% to 25% at autopsy. Any malignant tumour can metastasize to the pituitary gland, but breast and lung cancer are the most prevalent, accounting for two thirds of the cases [1-3]. McCormik described a surgical series of 780 cases of transsphenoidal surgery with only six cases (0,8%) of pituitary secondary lesions [4]. Metastasis of renal cell carcinoma is extremely rare. Komninos reported a series of 360 cases in which 2.6% of metastatic pituitary lesions were secondary spread of renal carcinoma [5]. We present a case of a renal carcinoma metastatic to the pituitary gland and an updated review of the literature, discussing clinical and radiological characteristics of these lesions.

Case report

We present a 67-year-old Italian female complained of severe headache and visual impairment. For increasing of headache she was transferred to our department. There was no history of trauma or other systemic disease. Ophtalmological examination revealed deteriorating right vision and bitemporal hemianopsy. Ocular motion was normal and there was neither paresis nor sensory disturbance of the extremities. Endocrinological study indicated panhypopituitarism. Magnetic resonance (MR) imaging showed on T1-weighted image an isointense intrasellar mass with suprasellar extension (Figure 1), which compression of the optic chiasm and heterogeneous enhancement after administration of gadolinium. MR angiogram detected displacement of the carotid siphon bilaterally with normal signal intensity of flow. Computed tomography (CT) scan demonstrated clear demineralization and ballooning of the sellar floor and upper clivus (Figure 2). The patient underwent a trans-sphenoidal tumor biopsy (Figure 3A-3C). Histological examination revealed a metastasis of renal cell carcinoma. Post-operatively CT scan abdomen revealed renal mass without signs of other metastatic site. She underwent a right radical nephrectomy, radiotherapy with local irradiation of 41 Grey to the pituitary region and replacement hormonal therapy (Table 1).

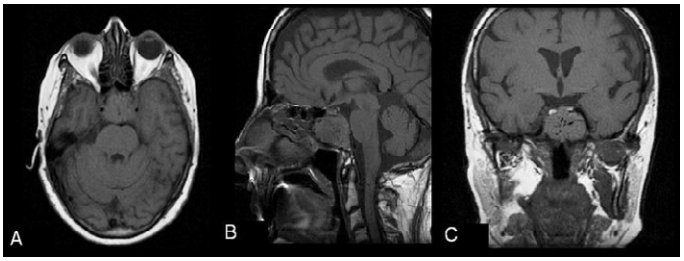

Figure 1: Axial (A), sagittal (B) and coronal (C) T1 weighted magnetic resonance (MR) images showing an isointense intrasellar mass with suprasellar extension.

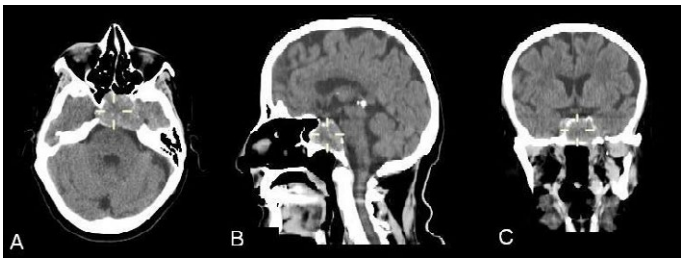

Figure 2: Axial (A), sagittal (B) and coronal (C) computed tomography (CT) scans demonstrating bony destruction of thehypophyseal fossa and upper clivus.

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Table 1. Reported cases of pituitary metastases from renal cell carcinoma.

Author (Year)	Age/Sex	Symptom	Endocrinological finding	Radiological finding	Other metastases
Anniko *et al.* [6]	59/M	Weakness, impotence, visual impairment	Hypopituitarism	Bony destruction	Controlateral kidney
Buonaguidi *et al.* [1]	53/M	Weakness, visual impairment	Hypopituitarism, diabete insipidus	Bony destruction, enhanced	NR
James *et al.* [2]	75/M	Visual impairment	Normal	Bony destruction, enhanced	NR
Eick *et al.* [10]	66/M	Weakness	Hypopituitarism	enhanced	NR
Horikoshi *et al.* [12]	51/M	Headache, visual impairment	Hypopituitarism	Bony destruction, enhanced	Lung
McCormick *et al.* [4]	35/F	Visual impairment	Hypopituitarism	Bony destruction, enhanced	NR
Koshiyama *et al.* [13]	57/M	Visual impairment	Hypopituitarism, diabete insipidus	enhanced	Pancreas
Nishio [16]	63/F	Visual impairment	Hypopituitarism	enhanced	NR
Weiss *et al.* [21]	59/M	Lethargy, impotence, visual impairment	Hypopituitarism	Bony destruction, enhanced	NR
Uchino *et al.* [18]	63/F	Visual impairment	NR	enhanced	NR
Beckett *et al.* [8]	56/M	Headache, Horner's syndrome	Hypopituitarism	enhanced	NR
Marar *et al.* [15]	54/M	Visual impairment	Hypopituitarism	NR	NR
	73/M	Asymptomatic	hypopituitarism	NR	NR
Weil [20]	53/M	Headache, impotence, 3th nerve palsy, visual impairment	Hypopituitarism, diabete insipidus	enhanced	NR
Weber *et al.* [19]	62/F	Headache, Visual impairment	Normal	enhanced	NR
Djimi *et al.* [9]	45/M	Visual impairment	Normal	enhanced	Lung
Basaria *et al.* [7]	77/F	Visual impairment	Hypopituitarism	NR	NR
Yokoyama *et al.* [3]	63/M	Headache, Visual impairment	Hypopituitarism, diabete insipidus	Bony destruction, enhanced	Lung
Pallud *et al.* [17]	70/M	Visual impairment	NR	NR	NR
Liu *et al.* [14]	54/M	Visual impairment	Hypopituitarism, diabete insipidus	Bony destruction, enhanced	NR
Gopan *et al.* [11]	67/M	Visual impairment	Hypopituitarism, diabete insipidus	NR	NR
	51/M	Visual impairment	hypopituitarism	NR	NR
	53/M	Visual impairment	Hypopituitarism, diabete insipidus	NR	NR
	67/F	Asymptomatic	Hypopituitarism	NR	NR
	61/F	Asymptomatic	Hypopituitarism	NR	NR
Present case	67/F	Headache, Visual impairment	Hypopituitarism	Bony destruction, enhanced	Absent

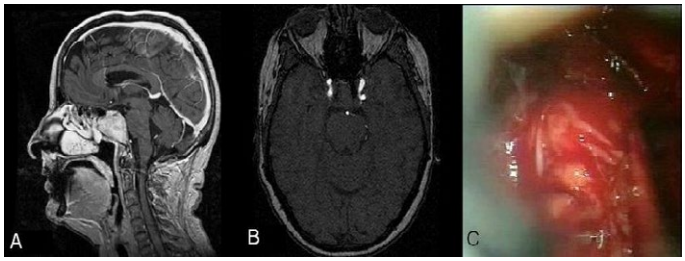

Figure 3: A) Sagittal T1 weighted MR image with gadolinium revealing marked contrast enhancement of the tumor without identifiable normal pituitary gland. B)Post-contrast axial T1 weighted MR angiogram showing displacement of the carotid siphon bilaterally with normal signal intensity of flow B) Intra-operative photograph of intrasellare mass.

Discussion

Symptomatic pituitary metastasis of renal cell carcinoma is very rare and only 25 cases have been described [1-4,6-21]. Only 7% of pituitary metastases are symptomatic [13,19,22]. Clinically diabete insipidus and visual field impairment are more frequent in pituitary metastasis than in pituitary adenoma, for involving of the posterior lobe of gland and the optic chiasm [6,16,20]. Gopan suggested pituitary metastases from renal cell carcinoma behave differently from other metastatic malignancies, more commonly involving the anterior pituitary [11]. In these cases hypopituitarism is more frequent than diabete insipidus. Cranial neuropathy can be present [8,12,15,20]. Radiological findings of pituitary metastases are very similar to those of primary pituitary tumor. On CT scan there are not important differences. MRI is not specific for pituitary metastases but particular signs, as isointensity on both T1 and T2 weighted images and loss of high intensity signal from posterior lobe of gland, can be suggestive [4,6,7,9,10,16-18,21].

Liu et al discovered that in many cases of pituitary metastasis there are a strong enhancement of the mass and a bone destruction without marked sellar enlargement [14]. McCutcheon *et al.* discovered that increased signal intensity in the contiguous hypothalamus on

T2-weighted MR images is frequently observed in these metastases [23]. Thickening of the pituitary stalk, sclerosis of the surrounding sellaturcica and invasion of the cavernous sinus may indicate a secondary lesion [24]. In some cases the diagnosis of the primary neoplasm was performed after the diagnosis of pituitary lesion. Rarely is it possible a total or subtotal surgical removal of the mass, while it is always recommended diagnostic biopsy. Chemotherapeutic agents like sorafenib and sunitinib can be useful [11]. The long-term benefit of postoperative radiotherapy is not known due to the rarity of such cases while stereotactic radiotherapy can be beneficial in sparing the optic nerves [22].

Conclusion

Pituitary metastases from renal cell carcinoma are very rare and may be difficult to diagnose. Clinical and radiological features may be suggestive. These lesions usually occur in highly disseminated renal cell carcinoma and every treatment can contribute to the improvement of the quality of life of such patients.

Consent

Written informed consent was obtained from the patient for publication of this case report and any accompanying images.

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