HYPOPITUITARISM CAUSED BY PITUITARY METASTASIS OF SUPRAGLOTTIC LARYNGEAL CARCINOMA: CASE REPORT

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SUMMARY - Intracranial metastases from laryngeal carcinoma are rarely clinically diagnosed. To our knowledge, this is the first report of hypopituitarism due to pituitary metastasis from laryngeal carcinoma. We report on a 70-year-old man who had a supraglottic squamous cell carcinoma, which was resected surgically followed by local full dose radiation therapy. Four months later, he presented with a sudden onset of diplopia, syncope, headache, general malaise and loss of appetite. Magnetic resonance imaging of the brain revealed a tumorous process of the sellar region. Endocrinological tests disclosed the presence of hypopituitarism. The tumor was subtotally resected endoscopically *via* endonasal transsphenoidal approach. Histopathology of tumor specimens indicated squamous cell carcinoma. Tumors of the sellar and parasellar region as in the case presented may easily be confused with pituitary adenoma. Pituitary metastases should be considered on differential diagnosis of unusual pituitary tumors, especially in patients with as well as in those without a history of malignant disease.

Key words: *Laryngeal neoplasms – complications; Larynx – pathology; Neoplasm metastasis; Pituitary neoplasms – diagnosis; Hypopituitarism – etiology; Case report*

Introduction

Laryngeal carcinoma is the second most common type of head and neck cancer. Laryngeal carcinomas are mainly squamous cell carcinomas. The incidence of distant metastases with laryngeal carcinoma varies from 3.7% to 16%[1]. The most common sites of distant metastasis are the lungs followed by bone and liver. Intracranial metastases in patients with head and neck cancer are rarely clinically diagnosed. The incidence of pituitary metastasis with malignant tumors is 1% to 3.6%[2-4]. Breast cancer is the most common tumor to metastasize to the pituitary gland, followed by lung cancer[4-6]. Diabetes insipidus secondary to pituitary metastasis is a common manifestation but hypopituitarism is rather rare[7,8]. We report on a 70-year-old man presenting with hypopituitarism secondary to pituitary metastasis from supraglottic laryngeal carcinoma. To our knowledge, this is the first case reported in the literature.

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Case Report

History

Five months before, the patient was diagnosed with squamous cell carcinoma of the left aryepiglottic fold of the larynx, stage IV A (T4a, N2b, M0). Radical neck

dissection was performed, the tumor was partially removed and residual tumor was left at the branching area of the common carotid artery. Local radiation therapy was administered in full dose. Four months later, he presented with a sudden onset of diplopia, syncope, headache, general malaise and loss of appetite.

Diagnostic evaluation

The patient was examined by the neurologist in a private polyclinic. Magnetic resonance imaging (MRI) of the brain with contrast revealed irregularly enhanced tumorous process of the sellar region, measuring 35×25×25 mm (Fig. 1). The mass extended upward to the suprasellar region without involvement of the optic chiasm. Based only on radiological findings, it was hard to determine the relationship between the mass and the cavernous sinus, but clinical picture suggested extension to the cavernous sinus. Two weeks later, the patient was admitted to our Department for further examinations and treatment for the sellar mass lesion. The patient had constant diplopia, headache, general malaise, loss of appetite, nausea, vomiting, and had lost 25 kilograms in the last 5 months. Neurological examination identified right sixth cranial nerve palsy and diplopia was reported in all directions. There was no evidence of lymphadenopathy. On abdominal examination, there was no hepatosplenomegaly and no palpable mass. Complete blood count, hepatogram and electrolytes were all within the reference values. Chest radiograph was normal. Endocrinological tests disclosed the presence of hypothyroidism, T3 0.972 (normal 1.1-2.8) nmol/L, T4 62.0 (normal 60-165) nmol/L, TSH 0.135 (normal 0.4-4.0) mIU/L; hypogonadism, LH 1.0 (normal 1.5-5.0) IU/L, FSH 1.6 (normal 1.0-10.5) IU/L, testosterone <0.7 (normal 10.5-49.0) nmol/L, borderline adrenal insufficiency, serum cortisol at 8 hours 189 (normal 138-800) nmol/L, at 17 hours 114 (normal 80-488) nmol/L, and free cortisol in urine 111 (normal 72.5-372.0) nmol/24h. Prolactin level was also slightly elevated, 34.2 (normal 2.0-20.0) mcg/L, probably due to pituitary stalk compression. Diabetes insipidus was absent and the function of the posterior lobe of the pituitary gland was preserved. Based on these studies and after consultation with a neurosurgeon and radiologist, the tumor was considered to be a nonfunctional pituitary adenoma. The patient was prepared for surgery and was transferred to Department of Neurosurgery.

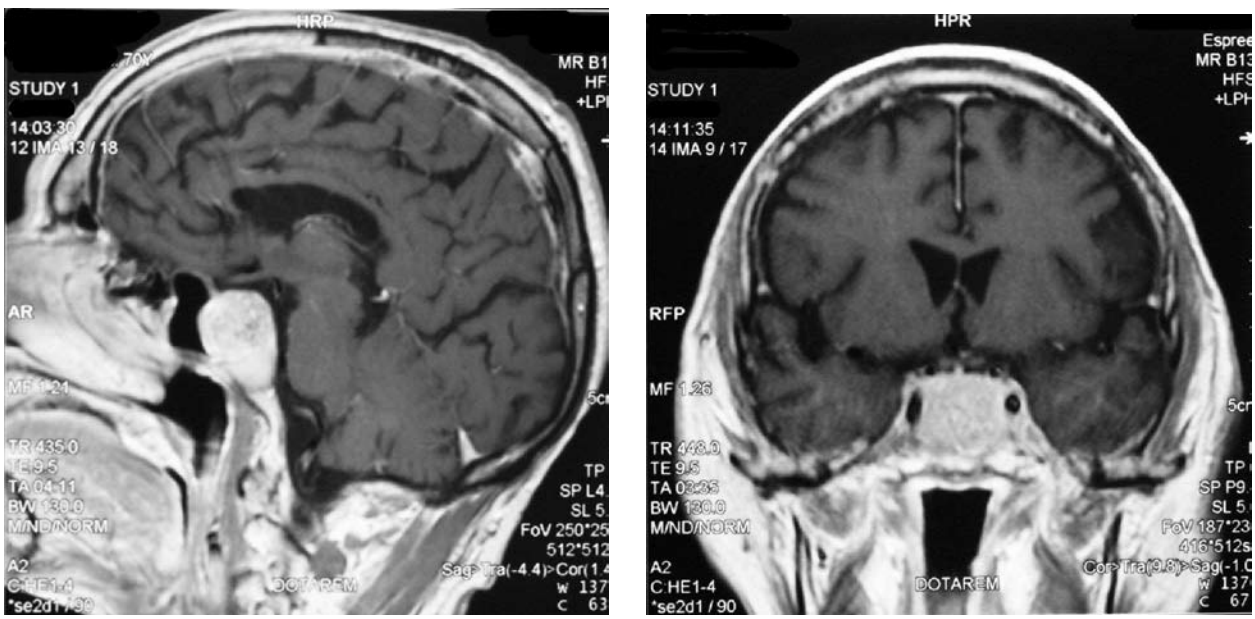

Fig. 1. Magnetic resonance imaging of the brain, sagittal and coronal T1-weighted postcontrast image: expansive tumorous process of the sellar region, which infiltrates sphenoidal sinus, partially destroys dorsum sellae and clivus, and expands to the prepontine and suprasellar cistern.

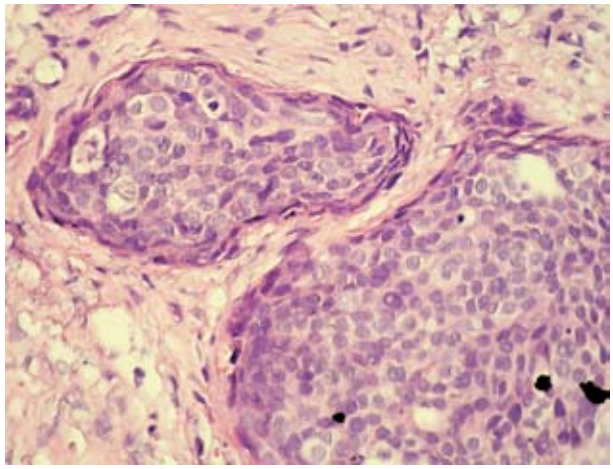

Fig. 2. H & E stained section (X400) shows poorly differentiated squamous cell carcinoma islands.

Treatment

The patient underwent endoscopic tumor resection using the binostril endonasal transsphenoidal approach[9]. The posterior wall of the sphenoidal sinus was partially destroyed by the tumor mass. Extremely firm tumorous tissue was reduced using the endoscopic technique with a wide variety of endoscopic instruments; and the CUSA instrument was used for the first time in endoscopic technique. Intraoperative histopathology revealed squamous cell carcinoma and the operation was discontinued. After the surgery, the patient was transferred back to our Department for initiation of replacement therapy. Histopathology of tumor specimens confirmed squamous cell carcinoma (Fig. 2). Transfer to Oncology Department was planned for palliative radiotherapy using linear accelerator.

Discussion

Patients with supraglottic carcinoma have a greater risk to be diagnosed with high-grade carcinoma than those with glottic carcinoma. This is due to fewer initial symptoms and denser lymphatic vascularity in the supraglottis. The risk of distant metastases in patients with laryngeal carcinoma significantly increases in high-grade carcinoma with advanced local and regional extension of the tumor. Our patient also had an advanced stage of supraglottic laryngeal carcinoma with tumor extension to the hypopharynx and with metastases to the regional lymphatic nodes. According to Spector and Sessions, the incidence of distant metastases in patients with laryngeal carcinoma treated with curative intent, depending on the localization within the larynx, are as follows: glottic 4%; supraglottic 3.7%; subglottic 14%; and aryepiglottic fold 16%[1]. The most common sites of distant metastasis are the lungs (58%) and bone (22%)[10]. Intracranial metastases from laryngeal carcinoma are rarely clinically diagnosed. To our knowledge, this is the first report of hypopituitarism due to pituitary metastasis from laryngeal carcinoma.

The incidence of pituitary metastases on autopsy is between 1% and 3.6%[4-6], and if parasellar region is included the incidence rises up to 27%[11]. Breast and lung carcinoma are the two most common forms of malignant tumors that metastasize to pituitary gland. Autopsy series and intraoperative histologic examinations in palliative hypophysectomy have documented pituitary metastases in 6% to 29% of breast cancer patients[11-14]. Within the pituitary gland, metastases are distributed as follows: 57% of the lesions are localized to the posterior pituitary alone, 13% to the anterior pituitary alone, 12% to both lobes, and the rest to the capsule or stalk. The highest involvement of the posterior pituitary is explained by direct arterial blood supply to neurohypophysis, whereas adenohypophysis receives its blood supply from the hypophyseal portal system[5]. Based on autopsy findings, only 7% of pituitary metastases are symptomatic[5]. According to Morita *et al.*, of all symptomatic patients 61% have diabetes insipidus, 47% anterior hypopituitarism, 39% headache, 33% visual deficits, and 25% ophthalmoplegia[15]. All these symptoms except for diabetes insipidus are common in pituitary adenomas. The question is how to differentiate pituitary metastasis from pituitary adenoma in patients with a history of malignant disease, but also in those in which pituitary metastasis is the initial symptom of a malignant disease. On autopsies of cancer patients, Max *et al.* found that 3.6% of all pituitary lesions were pituitary metastases and 1.8% were pituitary adenomas[3]. Pituitary metastases are more likely to produce visual deficits from suprasellar extension and from invasion of the cavernous sinus, due to invasiveness of tumors that metastasize to the pituitary[16]. The presence of diabetes insipidus also suggests pituitary metastasis[7,15]. In our case, the

patient had no visual deficits and no signs of diabetes insipidus. Right sixth cranial nerve palsy was present, but radiological findings could not confirm cavernous sinus invasion. There are few imaging characteristics that can help in differentiating pituitary metastases from pituitary adenomas: thickening of the pituitary stalk, loss of a high-intensity signal from the posterior pituitary, isointensity on both T_1- and T_2-weighted MR images, invasion of the cavernous sinus, and sclerotic changes around the sella turcica. They can be helpful but are in no way specific for pituitary metastases[15,17,18].

In conclusion, tumors of the sellar and parasellar region such as the present case are easily confused with pituitary adenomas. Metastases from tumors, including laryngeal carcinoma, to the pituitary gland are extremely rare. Despite their rarity, they should be considered on differential diagnosis of unusual pituitary tumors, especially in patients with, but also in those without a history of malignant disease.

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Sažetak

HIPOPITUITARIZAM UZROKOVAN METASTAZOM SUPRAGLOTIČNOG KARCINOMA LARINKSA U HIPOFIZU: PRIKAZ SLUČAJA

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Intrakranijske metastaze karcinoma larinksa se rijetko dijagnosticiraju. Prema našim spoznajama, ovo je prvi zabilježeni slučaj hipopituitarizma uzrokovanog metastazom karcinoma larinksa u hipofizu. Prikazujemo slučaj muškarca u dobi od 70 godina kojemu je dijagnosticiran supraglotički planocelularni karcinom larinksa koji je kirurški uklonjen te je provedena lokalna radioterapija u punoj dozi. Četiri mjeseca kasnije javljaju se naglo nastale dvoslike, glavobolja, sinkopa, opća slabost i gubitak apetita. Učinjena je MR mozga te je otkriven tumorski proces selarne i paraselarne regije. Endokrinološkim testovima otkriveno je postojanje hipopituitarizma. Tumor je djelomice odstranjen endonazalnim transsfenoidnim pristupom. Patohistološki nalaz pokazao je planocelularni karcinom. Tumori selarne i paraselarne regije, kao u ovom slučaju, lako se zamijene za adenom hipofize. Metastaze u hipofizu bi trebalo razmotriti u diferencijalnoj dijagnozi neobičnih tumora hipofize, pogotovo u bolesnika s poviješću maligne bolesti, ali također i u onih bez nje.

Ključne riječi: *Novotvorine larinksa – komplikacije; Larinks – patologija; Metastaza novotvorine; Novotvorine hipofize – dijagnostika; Hipopituitarizam – etiologija; Prikaz slučaja*