Cavernous sinus metastasis from oropharyngeal squamous cell carcinoma

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ABSTRACT

Metastasis to the cavernous sinus from head and neck cancer is uncommon and has been previously reported by a few authors. It is usually a late manifestation of the primary tumor and may be the first evidence of a widespread dissemination of the disease.

Main clinical findings are those related with involvement of cranial nerves III to VI as they pass through the cavernous sinus. Although diagnosis may be difficult, the appearance of clinical and radiological findings of cavernous sinus involvement in a context of head and neck cancer must alert us about an intracranial metastatic infiltration. In most cases treatment is palliative with radiotherapy and/or chemotherapy. The prognosis of this entity is poor, with survival of a few months.

We present the case of cavernous sinus metastasis from oropharyngeal squamous cell carcinoma and review the literature about the clinical presentation and management of this rare entity.

Key words: *Oral cancer, head and neck cancer, oropharyngeal cancer, squamous cell carcinoma, cavernous sinus, metastasis.*

RESUMEN

La metástasis al seno cavernoso procedente de carcinomas de cabeza y cuello es una rara entidad, que ha sido referida previamente por unos pocos autores. Normalmente es una manifestación tardía del tumor primario y puede ser la primera evidencia de una diseminación amplia de la enfermedad.

Los hallazgos clínicos fundamentales son aquellos relacionados con la afectación de los pares craneales III a VI, en su paso a través del seno cavernoso. Aunque el diagnóstico puede ser difícil, la presencia de hallazgos clínicos y radiológicos de afectación del seno cavernoso en un contexto de carcinoma de cabeza y cuello, debe alertar acerca de una infiltración metastática intracraneal. En la mayoría de los casos el tratamiento es paliativo con radioterapia y/o quimioterapia. El pronóstico de esta entidad es pobre, con supervivencia de unos pocos meses.

Presentamos un caso de metástasis de carcinoma epidermoide de orofaringe a nivel del seno cavernoso y realizamos una revisión de la literatura acerca de la presentación clínica y manejo de esta rara entidad.

Palabras clave: *Cáncer oral, cáncer de cabeza y cuello, cáncer de orofaríngе, carcinoma de células escamosas, seno cavernoso, metástasis.*

INTRODUCTION

The appearance of a local recurrence in head and neck cancer is not uncommon. Its correct management has been properly established in the literature. In contrast, involvement of distant locations from a primary tumour of the head and neck continue being a problematic question, moreover if an intracranial structure is implicated.

The affectation of the cavernous sinus (CS) from a tumour of the head and neck has been reported by only a few authors, probably due to its infrequent presentation and misdiagnosed nature. The presence of distant metastasis within the maxillary bones have also been reported (1,2). The appearance of more precise imaging diagnostic techniques have increased the number of reported cases in the last years (3-7). Since no direct extension from the primary tumour can be demonstrated, a metastatic nature of the CS involvement has to be considered.

Due to the existence of concomitant primary tumour, the surgical treatment of cavernous sinus metastasis (CSM) was not performed. Despite this, palliative management with radiotherapy and chemotherapy was performed, in order to avoid unnecessary morbidity and to obtain an improvement in quality of life.

CASE REPORT

A 64-year old man was referred to our Department with a left cervical mass and dysphagia in the past 2-3 months. In the physical examination there was a positive clinical neck, with a hard fixed node of 6x4 cm of diameter in left cervical level II, a hard mobile node of 1,5 cm of diameter in left cervical level III, and a hard fixed node of 5x3 cm in the right cervical level II. In the intraoral examination there was an exophytic and ulcerated lesion of the entire left tonsil, the left side of the uvula and extending to the vallecula, with a good mobilization of the tongue.

A Computed Tomography (CT) of head and neck was performed with the result of an increased mucosa of the left oropharyngeal space, with extension deeply into the parapharyngeal space. There were multiple cervical nodular images compatible with regional metastatic lymphatic nodes in left submandibular region and in left jugular chain and infiltrating common, internal and external carotid arteries. There were radiological positive nodes in level II and III of the right neck, with no infiltration of carotid arteries. Both jugular veins were collapsed and thrombosed. Both sternocleidomastoid muscles were infiltrated.

A Fine-Needle-Aspiration (FNA) was performed and it was informed as suggestive of oropharyngeal squamous cell carcinoma (SCC). Then a biopsy was performed with the result of SCC poorly differentiated of the oropharynx.

Due to the extension of the tumour, the surgical treatment was refused and radiotherapy was given in the oropharynx and cervical levels II, III and IV for 2 months with a total radiation of 7000 cGy. Simultaneously, chemotherapy with cisplatin firstly and taxol later were administered.

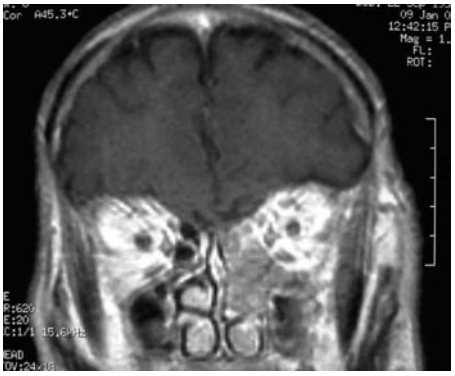

Fig. 1. MRI. Coronal view. Tumoral mass in the left nasal cavity and ethmoidal cells as a cranial extension of the oropharyngeal SCC.

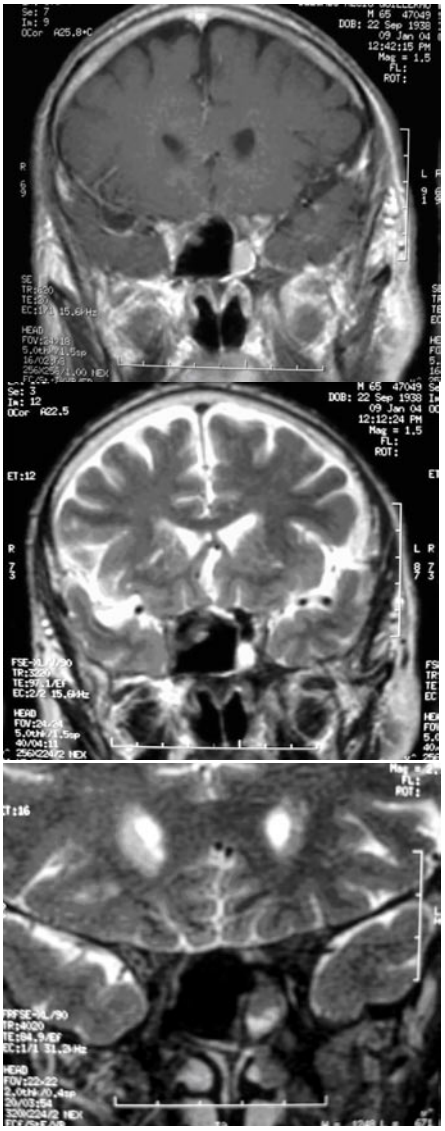

Fig 2,3,4. MRI. Coronal views. Engrossed right cavernous sinus suggesting mass compatible with metastasis from the primary tumor of the left oropharynx.

A new CT was performed two months after the administration of radiotherapy and chemotherapy with the result of probably residual metastatic nodes of 3 cm of diameter in cervical level II. The examination with fiberoscope did not show any disturbance in the tongue, lingual tonsil or vallecula, except for an edema in the epiglottis secondary to radiotherapy. A left radical neck dissection was then performed, after a balloon occlusion test of the left carotid artery and a cerebral arteriography were informed as normal. In the surgery it was extirpated the internal jugular vein, the spinalis nerve, and the common, internal and external carotid arteries, but the vagus nerve was preserved. No carotid bypass was performed. In the histological study it was observed a salivary submandibular gland with no alterations and five lymphatic nodes of level I and II with no microscopic alterations, but partial reactive fibrosis.

Seven months after the surgery a new left supraclavicular metastatic node appeared and it was treated with excision and postsurgical radiotherapy with 4750 cGy for 3 months. After that, the patient presented progressive dyplopia with the right gaze. There was no tumour in the oral cavity or the oropharynx, and no lymphatic nodes were appreciated in the cervical region. A CT scan was performed, but no alterations were observed. Then, a Magnetic Resonance Imaging (MRI) was performed with the result of an enlarged right cavernous sinus with occupation of the left cavum, left pterigopalatine fosse and left nasal cavity and ethmoidal cells (Fig. 1,2,3,4). A biopsy of the cavum was informed as SCC of the nasopharynx. The diagnosis was regional recurrence of oropharyngeal SCC in the left nasopharynx, with extension to the left nasal cavity and ethmoidal cells, and metastasis of oropharyngeal SCC in the right cavernous sinus. Palliative radiotherapy was administered in the skull base and the left pterigopalatine fosse, with a total dose of 5700 cGy. Concomitant palliative chemotherapy was administered with cisplatine for 3 weeks. At the end of the treatment an improvement in diplopia was observed. Six months after the surgery the patient remains alive.

DISCUSSION

Intracranial metastasis from head and neck SCC are rarely clinically diagnosed. Furthermore metastasis to the CS from head and neck cancer are uncommon too (4,9,10). It has been reported in a variety of primary tumours of the Head and Neck area such as SCC of the larynx (7,10-12), melanoma of the head and neck (3), SCC of the head and neck (4,5,14), nasopharyngeal carcinoma (4), oropharyngeal carcinoma (4), carcinoma of the oral cavity (4), thyroid papillary adenocarcinoma (6), rhabdomyosarcoma of the head and neck (13), salivary duct carcinoma of minor salivary glands and SCC of salivary glands (7).

Clinical findings are those related with involvement of cranial nerves III through VI as they pass the CS. Diplopia, ophthalmoplegia, decreased corneal reflex, dysesthesias, hypesthesia, headache, retroorbital pain and facial pain may be present (14). Our patient presented diplopia as a sign of an incipient affectation of the CS, with involvement of the abducens nerve. it is very interesting the frequent affectation of the cranial nerve VI, probably in relation with its more medial location in a reduced space such as the CS.

The affectation of structures such as the trigeminal nerve may cause alteration of facial sensation. The presence of pain or dysesthesia can be explained by the infarction of the nerve caused by cancer cell involvement of the vasa nervorum (5). Other symptoms such as ophthalmoplegia are in relation with lesions of cranial nerves III, IV and VI. Some metastatic tumours of the pituitary gland and the sellar region can involve cavernous sinus because of a lateral extension. Patients may present ptosis and diplopia, which are common in CSM. These symptoms can be associated with diabetes insipidus, because of the involvement of the posterior lobe of the pituitary gland. Our case presented diplopia with no other neuroendocrinologic disturbance, so a metastatic tumor of the pituitary gland was discarded.

Perineural metastasis has been described as a pathological feature of head and neck cancers (5). CS involvement may also be present, with abducens nerve palsy. This symptom is similar as reported by us, but in our case the perineural spread was not demonstrated, due to the absence of any cranial nerve symptom before the diagnosis of CS involvement was made. Instead of this, a vascular spread was thought to be the most probable cause of CS affectation in our patient. In relation to it, it is known that head and neck cancer situated in the proximity of the upper two divisions of trigeminal nerve may affect the CS by direct extension, in contrast with other tumours of the head and neck which involve CS by haematogenous metastasis (14). In our patient both jugular veins were thrombosed and there was infiltration of left common, internal and external carotid arteries. This is another reason why haematogenous dissemination was thought to be the more probable cause of CS affectation.

CT and MRI are useful for diagnosis of involvement of CS by metastatic disease. It is typical for CT to reveal a contrast-enhancing density in the parasellar region. Some authors (12) advocate for the use of thin tomographic sections of 5 mm or less, axial and coronal projections and large doses of intravenous contrast medium for the CS evaluation, to avoid a false-negative CT. Since MRI was introduced, a more acute diagnosis for CS lesions can be establish, due to its capacity for detection of solid masses of primary tumors or metastasis, and the presence of blood in cavernous sinus thrombosis (CST). In our case CT was not able to detect any abnormality, whereas MRI showed all the findings referred above. It is a well known finding for MRI to be more precise than CT for diagnosis of soft tissue disorders.

In concordance with other authors (15) we think that, in general, a suspected lesion of the CS with clinical and radiological findings, in a context of tumoral disease, should be considered metastatic until proven otherwise. In relation to it we think that the performance of a biopsy through a transphenoidal (8) or subtemporal (4) approach could be the confirmatory diagnostic procedure, but often not performed in the routine practice. In fact, few reports of CSM

are confirmed histopathologically. Surgical exploration of tumours in the CS has a high morbidity, so we preferred a diagnosis based in clinical findings and MRI to avoid additional damage.

An early diagnosis is fundamental for a proper management of the disease. The access of the tumor to the CS can be the first sign of a widespread dissemination. This is true in many cases, so a complete metastatic work-up with body-CT can be performed in order to determine the real extension of the disease. It is very important a correct differential diagnosis with other entities such as CST, carotid cavernous fistula, intracavernous carotid artery aneurysm, pituitary carcinoma and meningioma (16). Some authors (4) advocate for the use of a computer assisted stereotatic navigation and stereotatic radiotherapy with diagnostic and/or treatment purposes.

The treatment of metastasis and CS involvement has been mostly palliative, with the use of surgery, radiotherapy and chemotherapy. The trigeminal nerve section has been employed successfully in decreasing the facial pain (17). Radiotherapy has been the most frequently used treatment for CSM, with contrasted clinical improvement. It ranged from 2000 cGy to 8000 cGy in 10 to 30 fractions in the different works (11,14,17). Some authors (9) advocate for a more precise focused radiotherapy in the range of 6000 to 7000 cGy. We administered 5700 cGy to the skull base and left pterigopalatine fosse, which is in the range of total dose administered by most authors, and we observed a clear relief of symptoms with an improvement in patient´s quality of life.

Combinations of surgery, radiotherapy and chemotherapy have been successful used in the control of the CS involvement. Although we considered that there was not a curative treatment, a combination of radiotherapy and chemotherapy was performed in a palliative manner. The value of chemotherapy for the treatment of CS involvement from solid tumours of the head and neck has not been properly established. Due to the concomitant use of cisplatine and radiotherapy we performed, it is difficult for us to judge properly the efficacy of chemotherapy alone. As reported by other authors (14), we did not employ surgery for the treatment of the lesion in CS, although some authors (6) consider the possibility of a direct surgical management in order to obtain a transient symptomatic relief in extensive disease. Probably, surgical treatment may be performed when the primary tumour is under control. In cases of recurrence of the primary tumour and concomitant CSM, palliative management with radiotherapy and or chemotherapy may be indicated, moreover if we consider that this entity is in many cases the first sign of a widespread tumoral dissemination.

The prognosis of this entity is poor, with survival of a few months. Moreover, it is known a 75% to 85% expected mortality within two years (9). This is why the treatment is palliative in the vast majority of the cases. Despite this, a median survival of 3 to 6 months has been referred (4) for patients treated with radiotherapy in contrast with mean survival of 1 month for untreated patients. There is not a clear prognostic factor, but some authors (4) have found an association between the absence of active disease, the female sex and the age minor than 60 years with respect to an increased survival. Twelve months after the treatment our patient remains alive. This is more than the median survival, but follow-up is necessary to improve patients´ quality of life.

CONCLUSIONS

Cavernous sinus metastasis from oropharyngeal carcinoma is an extremely rare entity, which can be easily misdiagnosed. Clinical findings consisting in neurological disturbances related to cranial nerves III to VI, especially diplopia due to the affectation of abducens nerve, together with radiological findings of MRI, must make us to consider the existence of CS involvement in relation to metastasis of the primary tumour. Due to the oropharyngeal location of the primary tumour and the infiltration of cervical vessels in our patient, the haematogenous spread was though to be the most probable cause of CS affectation. This situation mostly implicates a widespread dissemination of the disease, with a poor prognosis. In cases of concomitant uncontrolled primary tumour we prefer to avoid any invasive diagnostic procedure such us the biopsy, due to the associated morbidity. In most cases treatment is palliative with radiotherapy with or without chemotherapy.

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