

Endoscopic-assisted microscopic decompression of adenoid cystic carcinoma of paranasal sinus extending to the sella: A case report and review of literature

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Abstract

Technological development in neuroendoscopy has lead to an expansion of its applications. The dimensions of a microsurgical approach to the brain can greatly be enlarged with the use of endoscope, making it possible to look behind structures and around corners. We performed an endoscopic assisted microsurgical decompression of an adenoid cystic carcinoma of paranasal sinus with intracranial sellar extension with good results.

Key words: *Adenoid cystic carcinoma, endoscopic assisted, microscopic decompression*

Introduction

Adenoid cystic carcinomas arising from minor salivary glands of the paranasal sinuses or nasal cavity are very aggressive neoplasms.^[1] They have a propensity to spread to contiguous intracranial structures like the sellar and parasellar areas. Long disease-free intervals have been observed in most cases following radical surgery and radiotherapy.^[1] However there is a high incidence of both local recurrence and distant metastasis. Radical excision through a transcranial approach of sellar extension of these tumors is usually fraught with increased post-operative morbidity.^[1] Endoscopic-assisted microscopic decompression is a minimally invasive technique and very safe for these tumors.^[2] The aim of this report is to describe a patient in whom an endoscopic-assisted microscopic decompression of a paranasal sinus adenoid cystic carcinoma with extension to sella was performed and also to review the literature.

Case Report

A 28-year old male presented with complaints of intermittent bloody nasal discharge from the left nostril

of 2 years duration, nasal blockage and blurring of vision in the left eye of 2 months duration. His general physical and systemic examinations were normal. There was no clinical evidence of metastasis. A local rhinoscopic examination revealed a pinkish red fleshy mass in the left nostril occluding the cavity partially extending to the nasopharynx through the choana. Neurologically, he was intact except for having the peripheral constriction of the visual field on the left side.

Magnetic resonance imaging (MRI) of the brain revealed a mass in the left ethmoid and sphenoid sinus extending to the sella superiorly and to the nasal cavity and nasopharynx inferiorly. The mass was iso to hypointense in the T1 weighted image and hyper intense in the T2 weighted image with inhomogeneous contrast enhancement [Figure 1]. The mass had eroded the lateral wall of the ethmoid sinus extending to the optic foramen on the left side. There was also an expansion of the sphenoid sinus and erosion of the roof and lateral wall on the left side through which it had invaded the sella, parasellar area and cavernous sinus. A MR-angiogram (MRA) showed normal vascular anatomy, no encasement of vessel and no tumor blush.

An endonasal endoscopic-assisted microscopic decompression of the tumor was performed. First, we performed an intra-tumoral decompression of the tumor popping out of the middle meatus left nostril with the help of a 0 degree neuroendoscope. Then, we performed an uncinectomy on the left side and a sphenoidotomy and, -excised the tumor mass in the ethmoid and sphenoid sinuses with the same endoscope. Then, -under microscopic vision, a transphenoidal excision of the sellar mass was performed. Finally, a 30 degree endoscope was placed in the parasellar area. The corners were visible and an endoscopic-assisted microscopic excision of residual tumor was performed. The tumor was pinkish-red in color, moderately vascular firm to soft in consistency arising from ethmoid and sphenoid sinus. A biopsy showed tumor cells arranged in a cribriform-pattern with hyper chromatic nuclei and-, a moderate amount of cytoplasm-, separated by fibro connective tissue consistent with adenoid cystic carcinoma. [Figure 2] Immediately following the operation the patient's nasal blockage had cleared. He had significant improvement in his vision on the left side. He was given radiotherapy and had regular follow-up visits. At the 6 months follow-up visit, he was asymptomatic and there was no clinical evidence of local recurrence or distant metastasis. A computed tomography (CT) scan of the head at that time [Figure 3] showed a small residual tumor in the cavernous sinus area.

Discussion

Adenoid cystic carcinoma of the paranasal sinus is a malignant tumor with a high propensity for metastasis and can spread to contiguous sites such as the sella and parasellar area. A radical or enbloc excision of this tumor through a transcranial approach is usually associated with increased morbidity.^[1] The minimally invasive approaches-such as the endonasal endoscopic transphenoidal, microscopic transphenoidal or endoscopic-assisted microscopic transphenoidal-are better options for these tumors where the basic goal of surgery-remains subtotal decompression.^[3-5] One can obtain adequate tumor tissue for histopathological diagnosis as well as can decompress the isolated optic nerve without much complication.^[6]

Endoscopic procedures have been classified according to their role on the neurosurgical procedure.^[7] They are: Pure endoscopic neurosurgery (EN), endoscopic-assisted micro neurosurgery (EAM), endoscopic-controlled micro neurosurgery (ECM), and endoscopic inspection (EI).^[8] EN uses the endoscope and surgical instruments inside it exclusively. EAM is a microneurosurgery procedure visually assisted by the endoscope. ECM uses micro neurosurgery instruments but not the microscope

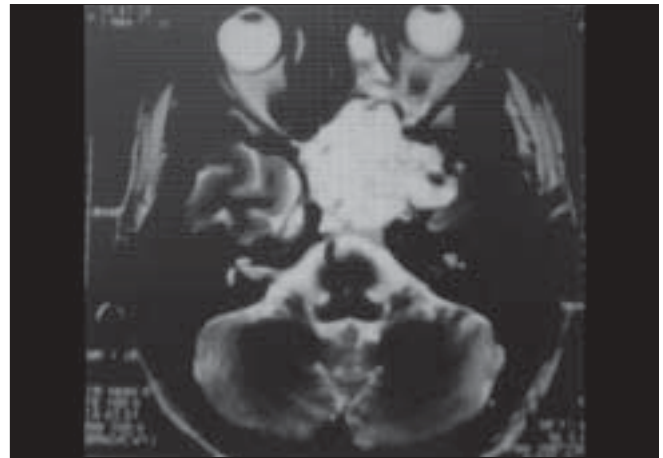


Figure 1: An MRI of the brain T2 weighted image showing a hyper intense mass in the ethmoid and sphenoid sinus extending to the sella

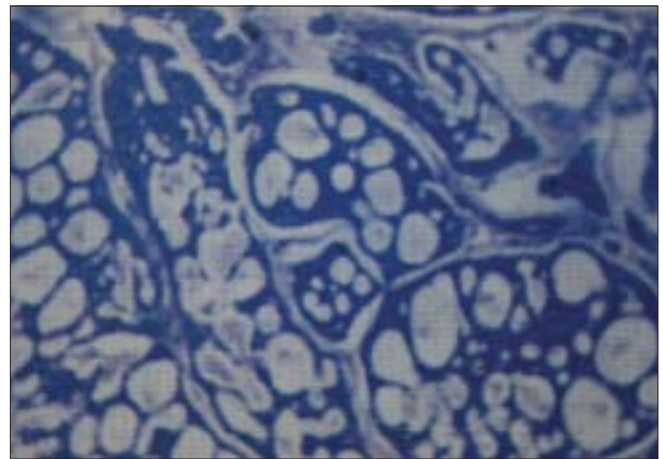


Figure 2: Photomicrograph showing histo-pathological features of adenoid cystic carcinoma

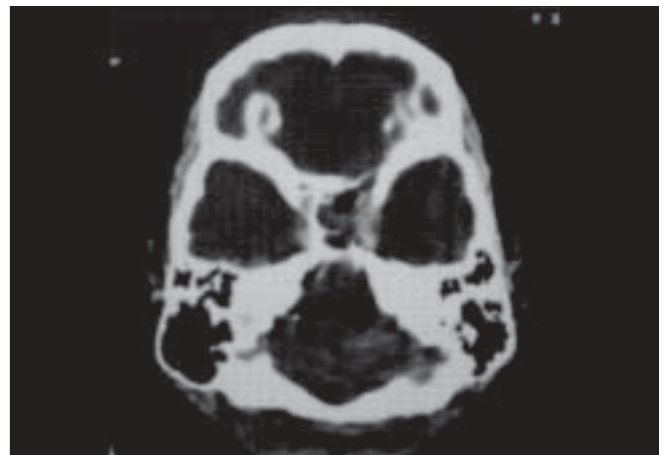


Figure 3: Follow-up CT scan of the head showing a residual tumor on the left side of the cavernous sinus

itself and vision is provided by the endoscope. EI may be used in any surgical procedure for inspection only. EAM improves the light and definition as well as allowing for a better lateral view of the areas next to the main

structures.^[7,8] The endoscope provides a less traumatic procedure, better light and better view of the places that the microscope would not allow. Also it makes possible inspection of bony orifices without tissue retraction.^[2,7,8] EAM has been given a lot of attention recently. Its indications and limits are not yet well defined. It allows for less invasive surgery and lower associated morbidity, which are goals of any surgical treatment. Advances in imaging methods have contributed to improve diagnosis and surgical planning. EAM may simplify the surgical approach to those lesions, and tumor removal, allowing for low morbidity.^[7,8,9] EAM's characteristic is to combine the advantages of micro neurosurgery and endoscopic surgery.^[7] Complex maneuvering is made through the microscope, and the endoscope allows identification of inaccessible regions, which improves the outcome of the surgery.^[8,9] The main disadvantages of the endoscope are related to the excessive amount of heading in the surgical field disturbing vision and the lack of three-dimensional view.^[2]

According to Gamea *et al.*, the endoscope allowed for better differentiation of the tumor and normal pituitary tissue, which helps in the complete removal of its supra and parasellar extension.^[4] In 1995, Helal reported that the combined micro endoscopic transphenoidal approach helps in radical excision of the tumor mass.^[5] Heilman *et al.*, used an endoscopic sphenoidotomy approach for sellar pathology and found post-operative nasal complications were nil in comparison with to the standard transnasal approach.^[10] Alfieri *et al.*, reported that endonasal endoscopic-assisted microscopic approaches to the cavernous sinus is a valid alternative approach to a transcranial one when the tumor is not likely to be pituitary adenoma.^[3] Kim *et al.*, described the endoscopic-assisted microscopic transphenoidal-decompression of a paranasal mass with sellar involvement.^[6]

Adenoid cystic carcinoma of the paranasal sinus is a locally aggressive tumor and usually spreads to the

sella and parasellar areas. Radical surgery followed by radiotherapy is the ideal treatment protocol for the local disease. An open craniotomy and decompression of-sellar and parasellar extension of the same results in increased morbidity and mortality.^[1] The endoscopic-assisted microscopic transphenoidal approach is a very safe and minimally invasive technique to decompress these tumors when presenting clinically with only isolated optic nerve compression features. Local recurrence and distant metastasis, particularly contiguous, that spread to the brain through the perineural route is very common in this type of tumor.^[1] Therefore long-term follow-up and a detailed clinico-radiological evaluation on each visit are essential for early detection of recurrence or distant spread of the disease.

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