Egyptian Journal of Ear, Nose, Throat and Allied Sciences 18 (2017) 241–246

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Contents lists available at ScienceDirect

Egyptian Journal of Ear, Nose, Throat and Allied Sciences

journal homepage: www.ejentas.com

Original article

Surgical strategy for frontal sinus inverted papilloma

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ARTICLE INFO

Article history:
Received 13 October 2017
Accepted 23 November 2017
Available online 6 December 2017

Keywords:
Frontal sinus
Sinonasal inverted papilloma
Modified lothrop procedure
Osteoplastic flap
Combined approach

ABSTRACT

Inverted papilloma (IP) is a benign tumor with a local aggressive nature and has a tendency to recur after excision. Despite the evolution of endoscopic techniques in the management of IP, external approaches still play a crucial role in frontal sinus involvement.

Objective: The present study aimed at planning a strategy for managing IP arising in or involving the frontal recess and/or frontal sinus.

Patients and methods: Ten patients with frontal sinus IP were enrolled in the present study. The type of surgical procedure was tailored according to the site of origin and extent of the tumor.

Results: Five combined surgeries and five extended endoscopic surgeries were performed in 1 year and 4 months with a follow up period of 2 years. Complete resection of the tumor was achieved in all the cases and no recurrences were reported at the end of the follow up period.

Conclusions: The exact approach to frontal sinus IP differ from one case to the other. Endoscopic frontal surgery is the mainstay in treatment of frontal sinus IP. External or combined approaches still remain a valid option for lesions affecting the mucosa of the frontal sinus extensively or extending far lateral.

1. Introduction

Management of the frontal recess and frontal sinus diseases pose a great challenge to rhinologists. In spite of the advances in the understanding of the anatomy and physiology of this area, surgical interference remains laborious. The tight anatomical boundary and vital surrounding structures of this region demand a highly qualified surgeon with expertise in endoscopic sinus surgery and external frontal sinus approaches.[1]Histologically, inverted papilloma (IP) is considered a benign tumor with an aggressive nature and a high tendency for recurrence after excision. The tumor is associated with malignant transformations and has the ability to destroy bones and extend to adjacent compartments.[2] Frontal sinus inverted papilloma may extend anteriorly eroding the anterior table of the sinus. Posterior extension into the anterior cranial fossa may involve the dura and cause frontal lobe manifestations. Orbital affection is caused by inferior extension of the tumor and may result in diplopia, proptosis and decreased visual acuity. The mass itself may obstruct the frontal sinus drainage and subsequently cause frontal sinusitis.[3]Currently, the approach of choice for the management in most of inverted papilloma cases is the endoscopic transnasal approach.[4,5] Some cases necessitate the creation of a wider access to the frontal sinus. This is obtained by performing an endoscopic modified Lothrop procedure Draf type IIb or Draf type III. The Draf IIb technique involves resection of the floor of the frontal sinus with the nasal septum as its medial boundary and the lamina papyracea as its lateral boundary. On the other hand, Draf III procedure aims at the creation of a common outflow tract to the frontal sinus through; removal of part of the nasal septum, the intersinus septum and the floor of the frontal sinus bilaterally. It provides maximum endoscopic exposure of the frontal sinuses allowing instrumentation through both nasal cavities. Tumors attached to the inferior and medial aspects of the frontal sinus may be amenable to such approaches.[6]In certain circumstances, the external and/or combined approaches are crucial to eradicate the tumor.[7] Endoscopically inaccessible lesions of the frontal sinus, whether benign or malignant, can be managed through an osteoplastic flap or a combined procedure.[8]Goodale and Montgomery started using osteoplastic flaps (OPF) as a substitute for endoscopic sinus surgery in these cases.[9,10] It is applicable for unilateral or bilateral lesions, which can be reached through a brow, mid-brow or coronal incision.[11]Due to the high rates of recurrence and the risk of malignant transformation, there is no

Peer review under responsibility of Egyptian Society of Ear, Nose, Throat and Allied Sciences.

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https://doi.org/10.1016/j.ejenta.2017.11.001
2090-0740/

definite strategy for inverted papilloma treatment. Etiology and pathology of IP are becoming more established. They increase the surgeons' knowledge about the nature of the disease enabling them to accomplish an efficient management of both primary and recurrent diseases.[7] The purpose of the current study is to plan a strategy to attack IP originating from or invading the frontal recess and/or the frontal sinus.

2. Patients and methods

A prospective study was conducted, after the approval of the Institutional Review Board (IRB) of Alexandria University Hospital, on the chart review of ten patients with frontal sinus inverted papilloma. These patients were operated upon using the endoscopic endonasal approach, external approach and/or a combination of both approaches at the Department of Otorhinolaryngology – Head & Neck Surgery, Alexandria Main University Hospital, from January 2013 to April 2014. Detailed history was taken from all patients, then they were subjected to a full otolaryngological examination including diagnostic nasal endoscopy. A biopsy under endoscopic guidance was obtained subsequently under local anesthesia, whenever possible. A detailed informed consent, including steps of surgery and the possibility to resort to the external approach, was signed preoperatively by all patients.

Preoperative evaluation: Preoperative radiology including CT and MRI after contrast medium administration was done for all the cases. In selected cases, the patient wore an electromagnetic headset before the CT was performed for navigation purposes.

Charts of the patients were reviewed for age, location(s) of the mass, extension of the tumor, surgical approach, histopathologic diagnosis and follow up. The various symptoms of the patients analyzed in the present study showed nasal obstruction as being the commonest symptom followed by frontal headache, epistaxis, facial pain and orbital complaints.

Endoscopic sphenoethmoidectomy and superior uncinectomy were initially performed. The tumor was identified and debulked carefully attempting to locate the attachment site/origin. After

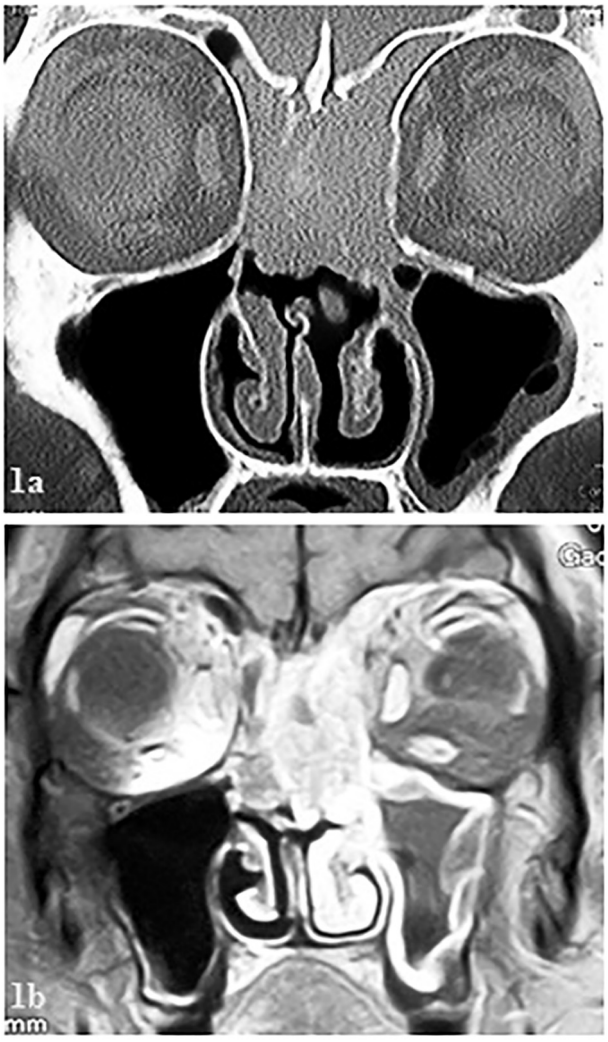

Fig. 1. Preoperative coronal CT scan (a) and a coronal T1 MRI post-contrast (b) showing a recurrent inverted papilloma which is occupying both nasal cavities, olfactory recesses, ethmoidal air cells, both frontal sinuses and invading the nasal septum.

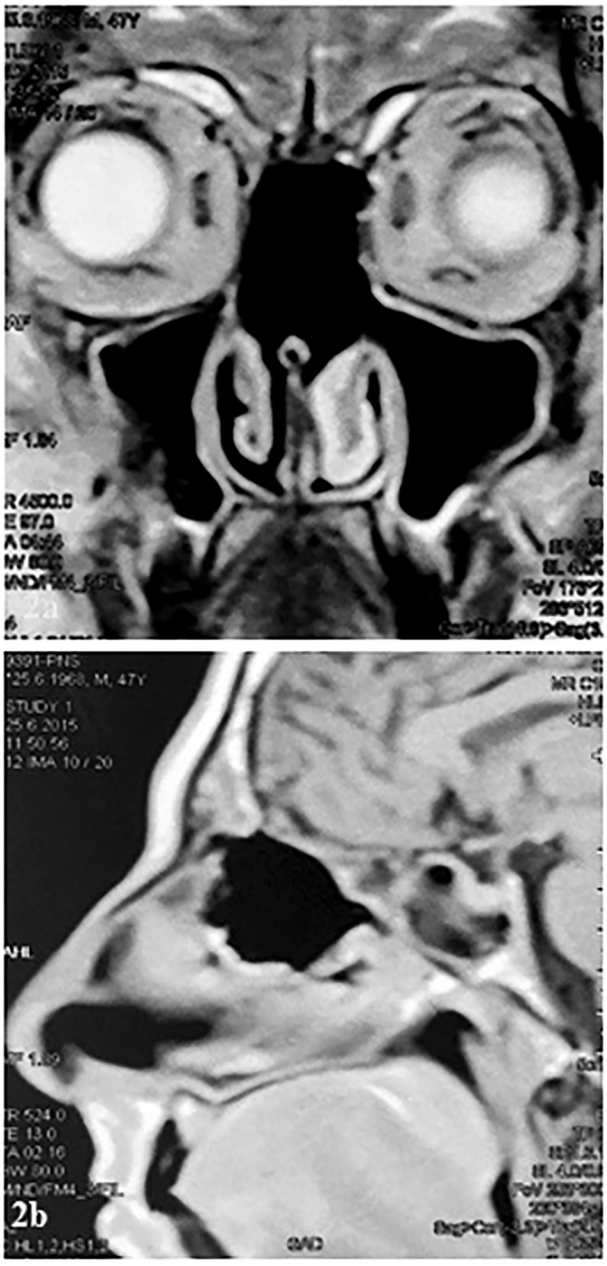

Fig. 2. Postoperative coronal T2 MRI (a) and sagittal T1 MRI post-contrast (b) of the first case showing complete resection of the tumor with mild scarring at the frontal recess area.