

Transpterygoid Endoscopic Approach for Inverted Papilloma of the Sphenoid Sinus: A Case Report

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ABSTRACT

We describe a clinical case of a woman with an inverted papilloma in the sphenoidal sinus. The sphenoid was highly pneumatized, and the inverted papilloma extended into a lateral recess of the sinus beyond the paraclival segment of the internal carotid artery, which was prominent. We performed a unilateral endonasal approach, combining a bilateral sphenoidotomy with a posterior septectomy and a transpterygoid approach to expose the lateral pneumatized recess of the sphenoid located behind the posterior wall of the maxilla. We resected completely the inverted papilloma with no evidence of recurrence.

Keywords: inverted papilloma, sphenoidal sinus, endoscopic surgery, transpterygoid approach

Abordaje endoscópico transpterigoideo para papiloma invertido del seno esfenoidal: Informe de un caso

RESUMEN

Se describe el caso clínico de una mujer que tuvo un papiloma invertido en el seno esfenoidal. El esfenoides fue muy neumatizado y el papiloma invertido se extendió a un receso lateral del seno, más allá de la arteria carótida interna paraclival, que fue proclivente. Se hizo un abordaje endonasal unilateral, combinando una esfenoidotomía bilateral con septectomía posterior con un abordaje transpterigoideo, para exponer el receso lateral neumatizado del esfenoides localizado detrás de la pared posterior del maxilar. El papiloma invertido fue resecado en forma completa, sin evidencia de recurrencias.

Palabras clave: papiloma invertido, seno esfenoidal, cirugía endoscópica, abordaje transpterigoideo.

INTRODUCTION

The inverted papilloma (IP) is a benign tumor that originates from the mucosa of the nasal cavities and paranasal sinuses. It is characterized by its local aggressiveness, tendency to recur, malignancy, and possible association with human papillomavirus infection¹.

The epithelium has an inverted growth pattern; it invaginates and grows within the underlying stroma, but the basal membrane remains intact².

Isolated involvement of the sphenoid sinus is rare, and complete tumor resection is challenging due to the tumor's potential to erode bone and extend to adjacent vital structures such as the optic nerve, oculomotor

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nerves, and internal carotid artery. Also, anatomical variants of the sphenoid bone, such as excessive pneumatization with large lateral recesses, dehiscence or prominence of the internal carotid artery, the optic nerve, or septa inserting into the second cranial nerve or the carotid artery, can increase the difficulties of surgical resection and complications.

We describe the case of a woman who had an isolated inverted papilloma in the sphenoid sinus, with lateral pneumatization distal to the paraclival carotid artery.

She was successfully treated using a transpterygoid endonasal approach to the sphenoid sinus with endoscopic assistance.

The rarity of the inverted papilloma's localization in the sphenoid sinus, the use of the transpterygoid approach to access the lateral recess of the sphenoid sinus occupied by the tumor, and the tumor's implantation in the carotid artery seemed relevant to us for describing this clinical case.

CLINICAL CASE

A 54-year-old woman reported left nasal obstruction and hyaline rhinorrhea lasting 10 months. Nasal endoscopy revealed a polypoid lesion in the posterior third of the left nasal cavity.

Computed tomography of the facial massif diagnosed a polypoid tumor occupying half of the sphenoid sinus and the posterior third of the left nasal cavity, with extension to the nasopharynx. The sphenoid bone showed bilateral lateral pneumatization without bony erosion. The protruding carotid arteries and septa inserted into them were observed (Fig. 1).

We performed an endonasal biopsy using endoscopes.

The histopathological report indicated nasosinusal inverted papilloma.

In the MRI with contrast, we observed an isointense lesion in T1 with a cerebriform appearance and

post-contrast enhancement, occupying the left sphenoid sinus and the posterior third of the nasal cavity (Fig. 2).

We indicated surgical treatment performed under general anesthesia using an endonasal-transmaxillary-transpterygoid approach with a left sphenoidotomy assisted by endoscopes.

A maxillary antrostomy and anterior and posterior ethmoidectomy were performed, with resection of the middle turbinate. We drilled the base of the pterygoid process, enlarging the previous left sphenoidotomy to expose the tumor within the sphenoid sinus and its lateral recess. The IP was resected by dissecting it from its site of implantation on the left paraclival carotid artery.

At the end of the surgery, we placed a hemostatic matrix, and nasal packing was not used (Fig. 3).

The patient remained hospitalized in a general ward and was discharged 24 hours later. She had a good recovery, and during follow-up consultations with endoscopy and magnetic resonance imaging, no recurrences of the inverted papilloma were detected over a one-year follow-up period (Fig. 4)

DISCUSSION

Inverted papilloma most frequently originates from the lateral nasal wall.

Its isolated localization in the sphenoid sinus is uncommon (between 1% and 12.7%).^{3,4}

When originating within the sphenoid sinus, it can remain asymptomatic for a long time until it erodes the anterior wall and causes nasal obstruction or headaches due to compression.

Computed tomography of the facial massif diagnoses partial or total occupation of the sphenoid sinus, and it can detect areas of hyperostosis that some consider to indicate the tumor's implantation site and areas of bone erosion.^{5,6}

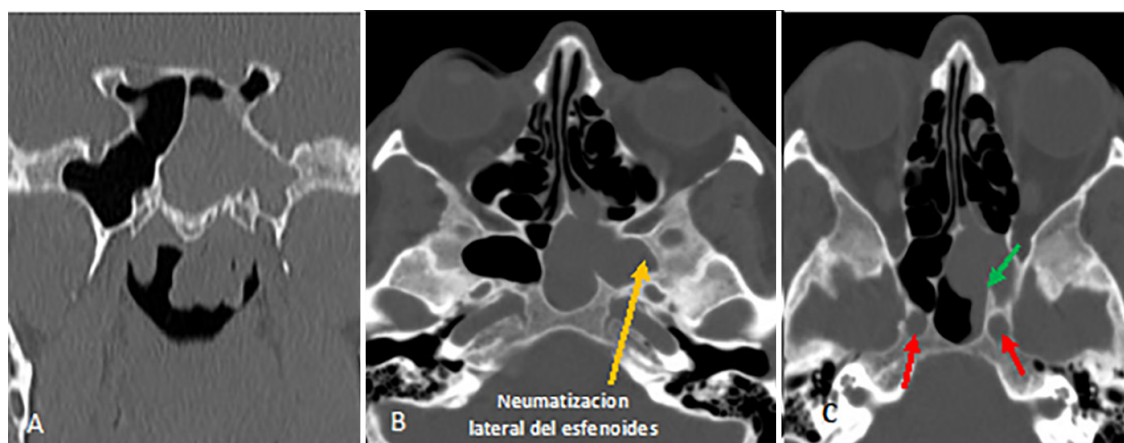


Figure 1. Computed tomography of the facial massif. A: Coronal slice; B and C: Axial slice. The left sphenoid sinus appears occupied by a polypoid extension reaching into the nasopharynx. The sphenoid sinus exhibits lateral pneumatization (yellow arrow), and the protruding carotid arteries are visible within the sinus (red arrows), with a bony septum inserted into the artery (green arrow).

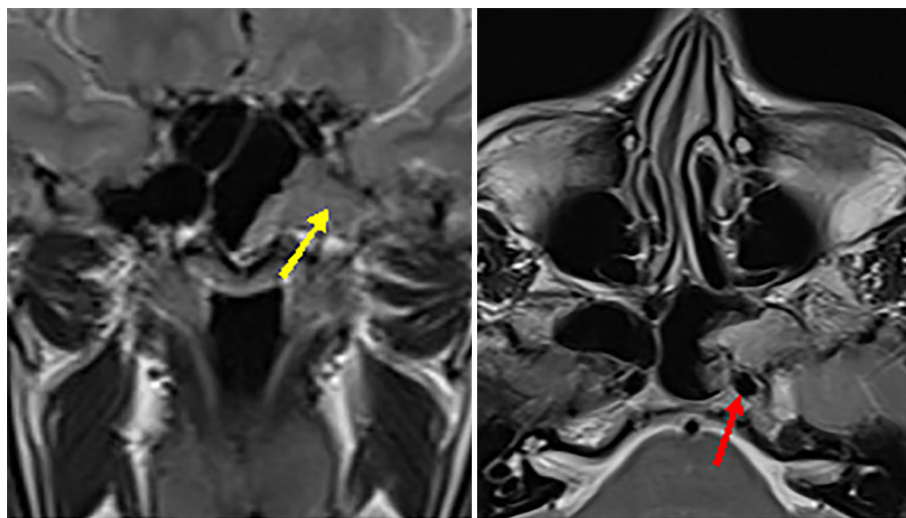


Figure 2. Magnetic resonance imaging (coronal and axial slices) after endonasal biopsy: the inverted papilloma is observed in the left sphenoid sinus with extension into the lateral recess (yellow arrow), the protruding internal carotid arteries within the sphenoid sinus, and the left carotid artery in contact with the tumor (red arrow)..

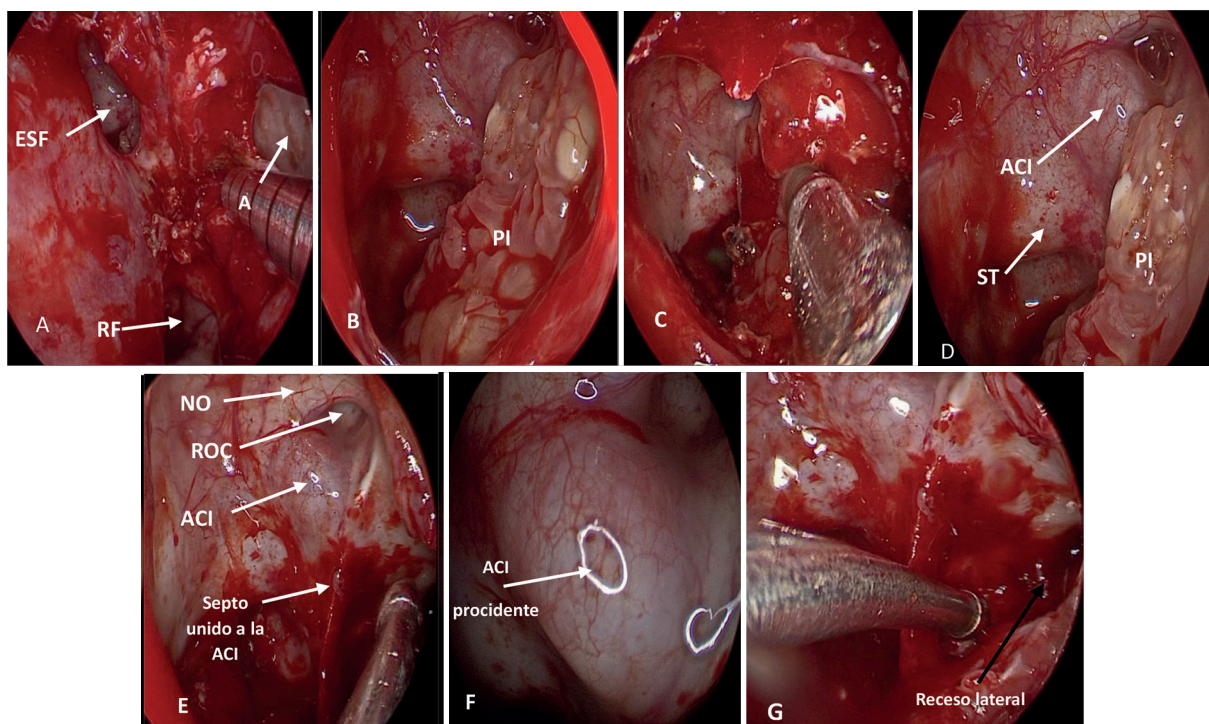


Figure 3. Bilateral paraseptal sphenoidotomy with posterior septectomy and transpterygoid approach (endoscopic image). A. View of the nasal corridor showing the maxillary antrostomy (AM), sphenoidotomy (ESF), nasopharynx (RF), and middle turbinectomy. B. The inverted papilloma (PI) is visible on the left side of the sphenoid sinus through the bilateral sphenoidotomy. C. Drilling the base of the pterygoid process to improve visualization of the PI in the left lateral sphenoid recess. D. The PI, the prominent internal carotid artery, and the sella turcica (ST) are visible. E. Protruding internal carotid artery (ICA), opticocarotid recess (OCR), optic nerve (ON), and septum inserted into the carotid artery. F. Protruding internal carotid artery (ICA). G. Lateral recess without PI after completing the surgery.

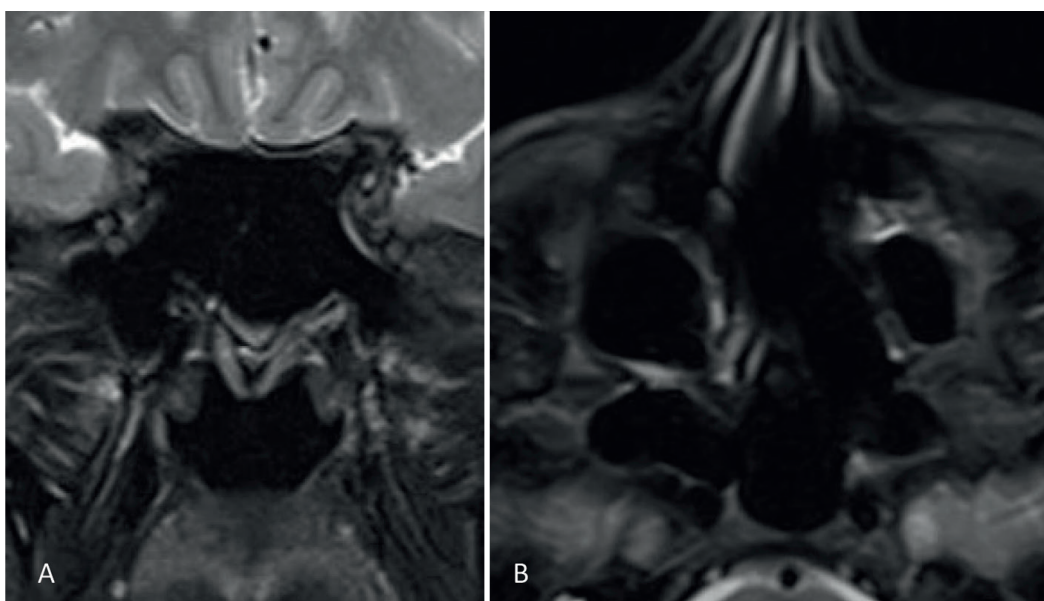


Figure 4. Magnetic resonance imaging, coronal section (A), and axial section (B). No evidence of inverted papilloma recurrence in the sphenoid sinus.

It is also possible to determine the degree of pneumatization of the sinus and the presence of lateral recesses that extend behind the posterior wall of the maxilla, as well as anatomical variations, such as protruding or dehiscent carotid arteries or optic nerves, with septa that may insert into these structures. That is crucial for planning the best endonasal surgical approach.

MRI provides a better diagnosis of the intracranial extension and allows differentiation between the IP and retained mucus.

Endonasal access with video endoscopy offers magnification and an angled view, making it the best surgical technique for exposing the sphenoidal sinus.

IP resection should be total to reduce recurrence rates.

Tumor implantation on the carotid artery, the floor of the sella turcica, the lateral walls of the sphenoid, excessive pneumatization, and bone erosion are factors that affect the possibility of achieving adequate local control and may increase complications⁷.

The dissection of a nasal corridor by performing a maxillary antrostomy, anterior and posterior ethmoidectomy, and unilateral or bilateral paraseptal sphenoidotomy with posterior septectomy is the most commonly used technique.

When the sphenoidal sinus has excessive pneumatization, accessing the lateral recesses beyond the paraclival carotid using only sphenoidotomy may be difficult.

The combination of sphenoidotomy with a transpterygoid approach allows access to the lateral sectors of the sinus and enables complete resection of the inflammatory polyp (PI).

The transpterygoid approach is also useful for accessing other regions of the skull base, such as the cavernous sinus, middle cranial fossa, petrous apex, nasopharynx, or infratemporal fossa (Fig. 5).

Intraoperative navigation and Doppler systems can enhance surgical precision and help reduce complications, though they were not utilized in the case described.

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Conflicts of Interest: The authors declare no conflicts of interest.

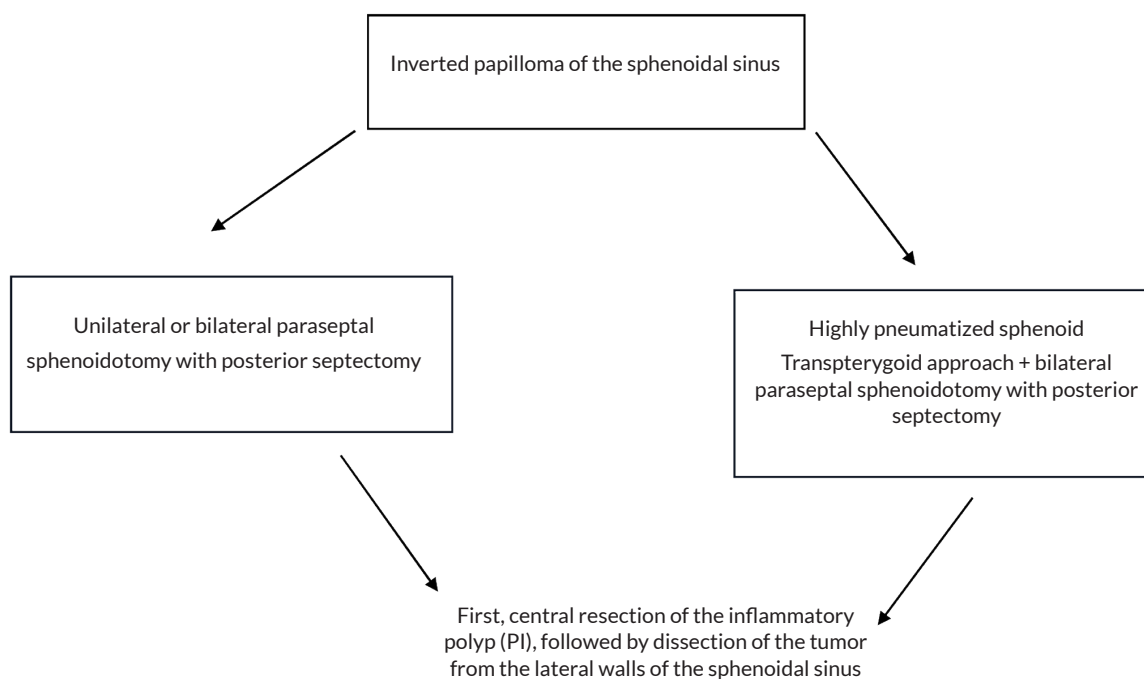


Figure 5. Endonasal surgical technique with endoscopes for the sphenoidal sinus based on pneumatization and dissection of the inverted papilloma

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