

## Isolated inverted papilloma of the sphenoid sinus

IOANNIS YIOTAKIS, IOANNIS PSAROMMATIS, LEONIDAS MANOLOPOULOS, ELEPHERIOS FEREKIDIS,  
GEORGIOS ADAMOPOULOS

### Abstract

Inverted papilloma is a rare benign sinonasal tumour, characterized by a potentially invasive nature. The lateral nasal wall represents the most common site of origin, whereas paranasal sinuses are quite frequently found to be involved by extension. In contrast, primary sinus inverted papillomas have rarely been reported. The present study describes an extremely rare case of inverted papilloma, isolated to the left sphenoid sinus, that was treated by a transnasal endoscopic procedure. The therapeutic approach chosen is discussed and the results of a two-year follow-up are also presented.

**Key words:** Papilloma, Inverted; Sphenoid Sinus

### Introduction

The inverted papilloma is a rare benign sinonasal tumour, usually arising from the lateral nasal wall when the schneideriay membrane inverts into the underlying stroma.<sup>1</sup> Although benign in nature, an inverted papilloma displays a peculiar biological behaviour that makes its management difficult. The tumour is characterized by its capacity to invade adjacent anatomical structures and by a high rate of recurrence after an incomplete resection, while it presents an index of associated malignancy which varies across different studies from less than two to 53 per cent.<sup>2–5</sup> For these reasons, the recommended treatment of choice consists of medial maxillectomy and en bloc tumour excision through lateral rhinotomy or a midfacial degloving approach.<sup>6–9</sup> However, recently a more conservative management via a transnasal endoscopic approach has been advocated by some authors and has produced good results.

Paranasal sinuses may often be involved by extension, but are only rarely reported as the site of origin of this tumour. In three recent and extensive series, there has been no reported case of primary sinus inverted papilloma.<sup>11,13,14</sup> Moreover, reviewing the whole literature one can hardly find any reports of inverted papillomas exclusively originating from the sphenoid sinus. In this study we present a rare case of inverted papilloma restricted to the sphenoid sinus and treated endoscopically. The surgical method applied to treat the lesion is justified and the results of a two-year follow-up are reported.

### Case report

A 46-year-old man presented with a one-year history of headache and left-sided facial pain. He also suffered from chronic anterior purulent nasal discharge and post-nasal drip. The patient was repeatedly treated with antibiotic courses and analgesics without showing any improvement. Anterior rhinoscopy and endoscopy revealed accumulated purulent secretions and hypertrophic nasal epithelium of the middle and superior meatus and a small, smooth,

polypoid-like mass just below the left sphenoid ostium (Figure 1). Computed tomography showed a homogeneously opacified left sphenoid sinus with no extension into the nasopharynx or posterior ethmoidal cells (Figure 2). The bony walls of the sinus were intact. The initial diagnosis was a sphenoid mucocele and the patient was scheduled for an endoscopic sphenoidotomy under general anaesthesia. By means of 30° and 0° 4 mm rigid endoscopes the anterior sphenoid sinus wall was removed to reveal a rather firm, greyish mass that filled the whole sinus. Its appearance was dissimilar to that of mucoceles or inflammatory polyps and a biopsy disclosed an inverted papilloma without evidence of malignancy (Figure 3). The tumour was meticulously removed, including the whole



FIG. 1

Pre-operative endoscopic view of a polypoid-like mass (arrow), just below the left sphenoid ostium (arrowhead).

From the Ear, Nose and Throat Department, University of Athens School of Medicine, 'Hippokraton' Hospital, Athens, Greece. Accepted for publication: 6 October 2000.



FIG. 2

Pre-operative computed tomography scan (coronal review). The tumour occupies the left sphenoid sinus, showing no extension to the nasopharynx or the nasal cavity.

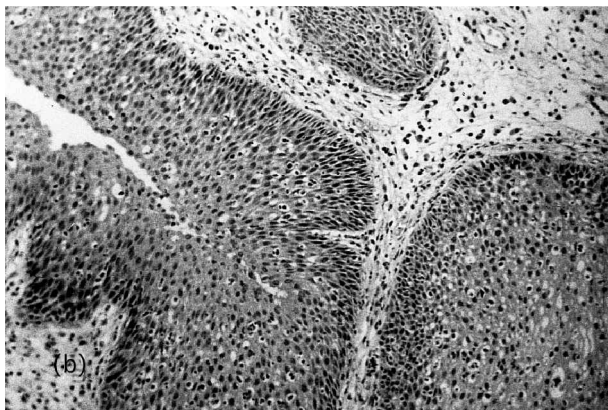
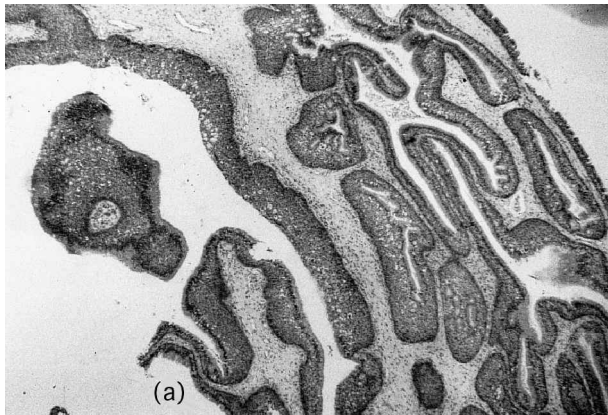


FIG. 3

(a) Low power histological appearance demonstrating endophytic epithelial growth into the connective tissue stroma (H & E; ×32). (b) A well-ordered hyperplastic respiratory epithelium predominates in this section. Inflammatory cell infiltration can also be seen in the underlying stroma (H & E; ×100).

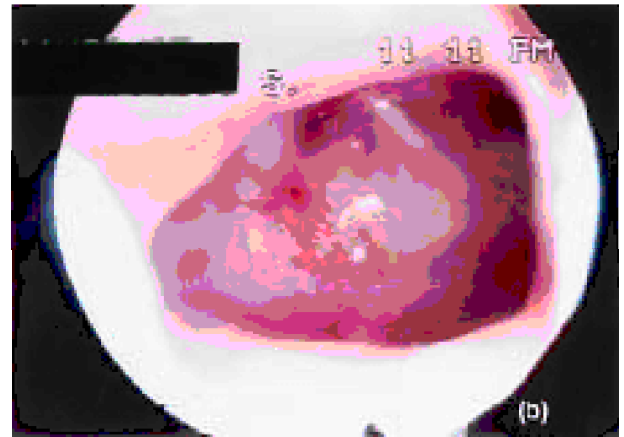
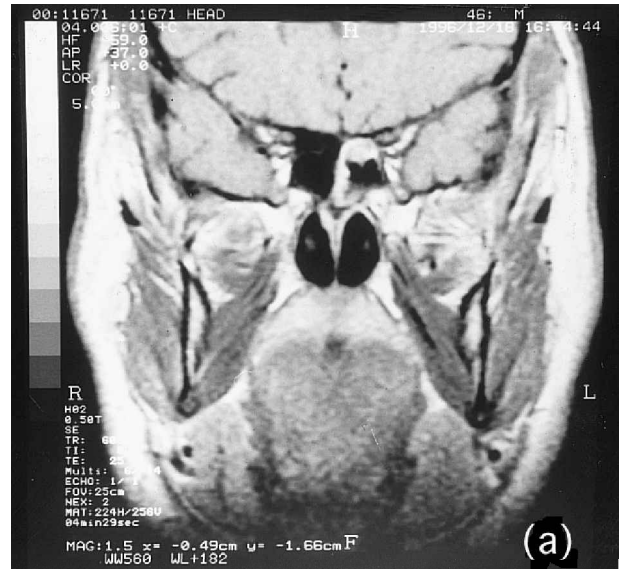


FIG. 4

(a) Post-operative magnetic resonance imaging (coronal view) a month after the tumour had been endoscopically excised. (b) Post-operative endoscopic view of the left sphenoid sinus through its enlarged ostium, two years after the transnasal endoscopic excision. The sphenoid sinus remains free of disease while well mucosalized.

sinus mucosa. Post-operatively, the patient did well and his symptoms were completely relieved. He was discharged the next day. A two year endoscopic follow-up failed to identify any recurrence (Figure 4b).

**Discussion**

Over the last years great interest has been focused on inverted papilloma and its idiosyncratic clinical behaviour. The tumour is more common in the fifth to seventh decades of life and has a clear male predominance.<sup>6,15</sup> Although benign in nature, it can erode adjacent bony structures by pressure, entering the paranasal sinuses, orbit or even endocranium. The management of this pathology remains controversial. The high rate of recurrence of inverted papillomas and the possibility of an associated malignancy advocate radical excisions through a lateral rhinotomy; however, equally good results have been reported from using a transnasal endoscopic approach.<sup>10-12</sup> Both methods demand total excision of the tumour, otherwise recurrence is highly possible.

The lateral nasal wall represents the most common site of origin of inverted papillomas.<sup>1,4,7,11</sup> The tumour may involve by extension the adjacent paranasal sinuses, most often affecting the ethmoidal labyrinth and maxillary antrum. Advanced lesions may involve the frontal and sphenoid sinus and the orbit as well. Hyams<sup>3</sup> reviewing 77 cases specified by their site of origin, reported maxillary sinus involvement in 64 per cent, ethmoidal cells in 25 per cent, frontal sinus in eight per cent and sphenoid sinus in four per cent of the cases. Waitz and Wigand<sup>11</sup> reported a tumour growth in the paranasal sinuses in 88 per cent of their patients (n = 51), the anterior ethmoid being the most frequently involved sinus (71 per cent) and the sphenoid sinus the least involved (10 per cent). Lawson *et al.*<sup>4</sup> found sphenoid sinus involvement in 10 per cent of their patients (n = 87), Smith and Gullane<sup>16</sup> in two per cent (n = 48) and Vrabec<sup>13</sup> in five per cent (n = 101), while McCary *et al.*<sup>12</sup> in their series found no sphenoid sinus involvement. Although solitary maxillary, ethmoid and frontal sinus lesions may rarely be described, a confined growth of an inverted papilloma into the sphenoid sinus was not reported in these studies. To our knowledge, the only case of an isolated inverted papilloma of the sphenoid sinus is that reported by Peters *et al.*<sup>17</sup> Peters *et al.* adopted a transeptal microscopic approach to treat their patient after a transnasal endoscopic method had failed to excise the whole mass.

The most common presenting symptom of inverted papillomas, nasal obstruction, was absent in our patient, this was expected given that the tumour was confined strictly within the sphenoid sinus. Epistaxis, the second most common symptom of inverted papillomas, was also absent. Although the sphenoid sinus is closely related to 13 fine and vulnerable neural and vascular structures,<sup>18</sup> neurological and ophthalmological examinations were normal. Having acquired several years' experience in treating sphenoid sinus pathologies endoscopically, a transnasal endoscopic approach was employed for many reasons. Firstly, the lesion was unilateral and limited within one anatomical site (left sphenoid sinus), showing no evidence of malignancy, as revealed by pre-operative CT scans and endoscopy and intra-operative histological examination. There are reported works which clearly state that limited inverted papillomas may be treated transnasally,<sup>4,10</sup> whereas Waitz and Wigand<sup>11</sup> believe that the treatment of even larger papillomas that are completely visualized can be accomplished endoscopically, without endangering the patient's life. Secondly, endoscopic surgery offers the advantages of avoiding surgical scars, cosmetic deformities and post-operative problems such as numbness of the face and moderate pain. It is generally accepted that reduced operating time, minimal blood loss and shorter post-operative hospitalization represent additional advantages of this method. Furthermore, direct visualization permits a precise evaluation of the boundaries of the tumour, while the site of its origin may be more easily determined. Alternative procedures (such as a lateral rhinotomy approach) could be adopted post- or even intra-operatively, if the tumour cannot be controlled completely during an endoscopic operation.<sup>11</sup> Finally, endoscopic follow-up can be reliably performed through the enlarged sphenoid ostium and recurrences can be detected early and excised.

The majority of recurrences of inverted papilloma usually occur early after treatment and are highly related to the method of surgical treatment, ranging from six to 78 per cent.<sup>12,19–21</sup> Generally, limited excisions are characterized by a high incidence of recurrence due to insufficient exposure and incomplete resection of the tumour, whereas radical excisions have resulted in significantly lower

recurrence rates.<sup>6,8,20,22</sup> Our patient was treated by a transnasal endoscopic approach and he remains free of disease two years after surgery. Although recurrence may occur in the following years, this case provides further evidence that the complete removal of the tumour is the crucial point in treating inverted papillomas, not the type or the extent of the surgery. Of course, open methods must be employed when a lesion cannot be completely excised endoscopically. Finally, the surgeon's experience plays a major role in deciding which operation will be applied. Irrespective of the surgical method implemented for excising inverted papilloma, a strict follow-up is strongly indicated in order for recurrences to be detected early. In general, three year follow-up seems to be sufficient, since a residual disease or a true recurrence would be manifested during this time-interval.

The non-specific symptomatology and the idiosyncratic clinical behaviour of inverted papilloma makes this neoplasm a diagnostic and therapeutic challenge for head and neck surgeons. Certainly, the extremely unusual case presented here proves that this distinctive nasal tumour should always be kept in mind when dealing with isolated sphenoid sinus pathology.

## References

- Batsakis JG. *Tumours of the Head and Neck* 2nd edn. Baltimore: Williams & Wilkins 1979
- Lampertico P, Russel W, MacComb W. Squamous papilloma of the upper respiratory epithelium. *Arch Pathol* 1963;7:293–302
- Hyams V. Papillomas of the nasal cavity and paranasal sinuses. A clinico-pathologic study of 315 cases. *Ann Otol Rhinol Laryngol* 1971;80:192–206
- Lawson W, Le Benger J, Som P, Bernard P, Biller H. Inverted papilloma: An analysis of 87 cases. *Laryngoscope* 1989;99:1117–24
- Dolgin S, Zaveri V, Casiano R, Maniglia A. Different options for treatment of inverting papilloma of the nose and paranasal sinuses: a report of 41 cases. *Laryngoscope* 1992;102:231–6
- Cummings C, Goodman M. Inverted papilloma of the nose and paranasal sinuses. *Arch Otolaryngol* 1970;92:445–9
- Vrabec D. The inverted Schneiderian papilloma: a clinical and pathological study. *Laryngoscope* 1975;85:186–220
- Segal K, Atar E, Mor C, Har-El G, Sidi, J. Inverting papilloma of the nose and paranasal sinuses. *Laryngoscope* 1986;96:394–8
- Phillips P, Gustafson R, Facer G. The clinical behavior of inverting papilloma of the nose and paranasal sinuses: report of 112 cases and review of the literature. *Laryngoscope* 1990;100:463–9
- Kamel R. Conservative endoscopic surgery in inverted papilloma. *Arch Otolaryngol Head Neck Surg* 1992;118:649–53
- Waitz G, Wigand M. Results of endoscopic sinus surgery for the treatment of inverted papillomas. *Laryngoscope* 1992;102:917–22
- McCary S, Gross C, Reibel J, Cantrell R. Preliminary report endoscopic versus external surgery in the management of inverting papilloma. *Laryngoscope* 1994;104:415–9
- Vrabec DP. The inverted Schneiderian papilloma: a 25-year study. *Laryngoscope* 1994;104:582–605
- Lawson W, Ho B, Shaari C, Biller H. Inverted papilloma: a report of 112 cases. *Laryngoscope* 1995;105:282–8
- Lawson W, Biller H, Jacobson A, Som P. The role of conservative surgery in the management of inverted papilloma. *Laryngoscope* 1983;93:148–55
- Smith O, Gullane PJ. Inverting papilloma of the nose: Analysis of 48 cases. *J Otolaryngol* 1987;16:154–6
- Peters B, O'Reilly R, Willcox J, Rao V, Lowry L, Keane W. Inverted papilloma isolated to the sphenoid sinus. *Otolaryngol Head Neck Surg* 1995;113:771–7
- Proetz AW. The sphenoid sinus. *Br Med J* 1984;2:243–5

- 19 Snyder RM, Perzin KH. Papillomatosis of nasal cavity and paranasal sinuses (inverted papilloma, squamous papilloma). A clinicopathological study. *Cancer* 1972;**30**:668–90
- 20 Suh K, Facer G, Devine K, Weiland L, Zujko R. Inverting papilloma of the nose and paranasal sinuses. *Laryngoscope* 1977;**87**:35–46
- 21 Eavey RD. Inverted papilloma of the nose and paranasal sinuses in childhood and adolescence. *Laryngoscope* 1985;**95**:17–23
- 22 Calcaterra T, Thompson J, Paglia D. Inverted papilloma of the nose and paranasal sinuses. *Laryngoscope* 1980;**90**:53–60

Address for correspondence:

I. Yiotakis,  
17 Thiseos Street,  
GR 14671, Kastrì  
Athens, Greece.

---

Dr I. Yiotakis takes responsibility for the integrity of the content of the paper.

Competing interests: None declared

---