

Endonasal endoscopic surgical treatment of paranasal sinus inverted papilloma - first experiences*

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SUMMARY

Purpose: Surgical excision is generally regarded as the treatment of choice for inverted papilloma. However, the approach and extent of surgery has been subject of much debate. The purpose of this study is to evaluate the results of endoscopic sinus surgery in the treatment of paranasal sinus inverted papilloma.

Patients and Methods: Thirteen cases of inverted papilloma of the paranasal sinuses treated via endoscopic sinus surgery were evaluated. The follow-up averaged from 9 months to 48 months with a mean of 27 months.

Results: A close follow-up of all patients was maintained. Seventy-seven per cent (10/13) of the patients had no recurrence after the initial endoscopic procedure. Three patients had recurrences of their tumor within 11 months after surgery, which means a rate of 23% (3/13). In 2 patients, the recurrences were treated endoscopically. In one patient, recurrence and malignant transformation (squamous cell carcinoma) developed after 36 months, which means that the associated carcinoma rate was 7% (1/13). This patient underwent radical maxillectomy and postoperative radiotherapy. None of the patients died of inverted papilloma.

Conclusion: Endoscopic sinus surgery is a viable treatment alternative for paranasal sinus inverted papilloma in selected cases. This approach should be performed by experienced surgeons and a close follow-up is mandatory. When the disease is more extensive, it should be approached by radical surgery, e.g. en-bloc excision by medial maxillectomy via lateral rhinotomy or mid-facial degloving.

Key Words: endoscopic sinus surgery, inverted papilloma, paranasal sinuses

INTRODUCTION

The treatment of nasal and paranasal sinus inverted papilloma is controversial due to the danger of recurrence, malignant transformation, or destructive growth beyond the boundaries of the nasal cavity. Although surgical excision is generally regarded as the treatment of choice, the approach and extent of surgery has been the subject of debate. Most otolaryngologists recommend medial maxillectomy and en bloc resection via lateral rhinotomy or midfacial degloving (Philips et al., 1990; Dolgin et al., 1992). However, conservative surgery has been reported to be effective in selected cases (Kamel, 1992; Waitz and Wigand, 1992; Stankiewicz and Girgis, 1993; Sham et al., 1998).

Inverted papillomas tend to recur with recurrence rates ranging from 0% to 78% (McCary et al., 1994). Although the tumor is initially unifocal, if not adequately removed it can become multifocal, which can be a recurrence problem (Stankiewicz and Girgis, 1993). The fact that most recurrences occur early and at the site of the original tumor, strongly suggests that incomplete

local resection is the main cause of recurrent disease (Waitz and Wigand, 1992; McCary et al., 1994). Additionally, inverted papilloma can be associated with squamous cell carcinoma. Lawson (1989) reported the rate of associated carcinoma to be between 2% to 53%, although most series place the incidence in the 5% to 15% range (Philips et al., 1990).

Because of the propensity of recurrence and the association of malignancy, most surgeons adopt the radical extranasal approach (Philips et al., 1990; Dolgin et al., 1992). With the introduction of the nasal endoscope, along with the radiologic advances such as computerized tomography (CT) and magnetic resonance imaging (MRI), the ability of the surgeon to localize disease has been greatly enhanced. Recently, a few authors have reported their experience with the treatment of inverted papilloma via an endoscopic excision (Kamel, 1992; Waitz and Wigand, 1992). The excellent visualization of the sinonasal cavity by endoscopic surgery with minimal aesthetic and functional loss suggests that it may be a valuable tool in the treatment of inverted papilloma.

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The present study reviews 13 cases of inverted papilloma treated via endoscopic surgery in an attempt to evaluate its indications, limitations and results.

PATIENTS AND METHODS

Patients

A retrospective evaluation was done of the clinical course of 13 patients with inverted papilloma of the nose & paranasal sinuses treated via endoscopic surgery at the Department of Otorhinolaryngology of the Istanbul School of Medicine. All patients were male with an age distribution ranging from 38 to 68 years. All patients were assessed preoperatively by endoscopic examination and coronal and axial computed tomography (CT) imaging. Three patients had an histopathologic diagnosis of inverted papilloma preoperatively.

Four patients had a history of previous nasal surgery, mostly polypectomies without histologic examination of the resected material.

The follow-up varied from 9 months to 48 months with a mean of 27 months and was performed in the clinic using rigid endoscopes.

Surgical Treatment

The endoscopic resection of the tumor was performed under general anesthesia. The nose was prepared using ribbon gauze soaked in 4% Cocain solution. Additionally, 1% lidocain + 1:100.000 adrenalin solution was injected to the lateral nasal wall mucosa. We resected inverted papillomas under endosco-

pic control, beginning with an immediate and macroscopically complete tumor debulking. After the gross tumor had been resected, residual suspicious areas and margins were sampled and sent individually to make paraffin sections. Lesions involving ethmoid sinuses and turbinates were resected directly. In two cases extending into the maxillary sinus, preserving the nasolacrimal duct, complete resection of the medial wall of the maxillary sinus together with the inferior turbinate was performed. During surgery, because of the pathology of inverted papilloma, one other sinus was always opened for histologic examination. We performed surgery with straight and angulated forceps and the underlying bone was burred with a diamond drill for clearance of deep-reaching tumor infiltration.

We preserved the unaffected mucosa and the nasal bony wall (lamina papyracea, the medial part of the orbital floor and the anterior wall of the maxillary sinus) to facilitate a functional recovery.

RESULTS

In the present study, 12 out of 13 patients with inverted papilloma were treated primarily with endoscopic surgery and the remaining 1 patient had secondary endoscopic resection (Table 1). This patient had been treated in another hospital with the external approach and the tumor was reported to be present only in the nasal cavity. The patient underwent endoscopic surgery for recurrence in our clinic. Except for this patient, the inverted papilloma was noted to arise on the lateral nasal wall in

Table 1. The characteristics of the patients.

Patient No	Age/sex	Tumor location	Surgery	SCC	Recurrence	Follow-up period (months)
1	53/M	LNW, inferior and medial wall of maxillary sinus	Endoscopic	-	yes	11 mo
2	58/M	Medial maxilla, ethmoid and sphenoid sinüs	Endoscopic	-	no	48 mo
			Radical maxillectomy + RT	+	no	42 mo
3	61/M	Lateral nasal wall	Endoscopic	-	no	37 mo
4	67/M	Lateral nasal wall	Endoscopic	-	no	34 mo
5	38/M	Lateral nasal wall	Endoscopic	-	no	31 mo
6	52/M	Lateral nasal wall	Endoscopic	-	no	29 mo
7	53/M	LNW, inferior turbinate inferior wall of maxillary sinus	Endoscopic	-	yes	9 mo
8	48/M	Nasal cavity ethmoid sinus	Endoscopic	-	no	26 mo
			Medial maxillectomy	-	yes	11 mo
9	62/M	Lateral nasal wall	Endoscopic	-	no	23 mo
10	62/M	Lateral nasal wall	Endoscopic	-	no	20 mo
11	68/M	Lateral nasal wall	Endoscopic	-	no	18 mo
12	39/M	Lateral nasal wall	Endoscopic	-	no	17mo
13	49/M	Lateral nasal wall	Endoscopic	-	no	14 mo
	63/M	Lateral nasal wall	Endoscopic	-	no	12 mo

LNW: Lateral nasal wall, RT: Radiotherapy

SCC: Squamous cell carcinoma

Table 2. Results of previous reports for Inverted papilloma.

Authors	Recurrences:	Recurrences:
	Extranasal	Endonasal
Cummings and Goodman (1970)	2/8 (25%)	15/22 (68%)
Suh et al. (1977)	4/30 (13%)	6/21 (29%)
Calcaterra et al. (1980)	5/33 (15%)	14/18 (78%)
Waitz and Wigand (1992)	3/16 (19%)	6/35 (17%)
Stankiewicz and Girgis (1993)		5/15 (33%)
Mc Cary (1994)	7/17 (17%)	0/7 (0%)
Sham et al. (1998)		6/22 (27%)
Brors et al. (1999)		4/22 (18.2%)
The present study		3/13 (23%)

all other patients. The tumor was limited to the lateral nasal wall in 9 patients. In 2 patients, the inverted papilloma extended to the inferior medial walls of the maxillary sinus and the inferior turbinate. In another patient, the inverted papilloma involved the left maxillary sinus wall, the ethmoid sinus and extended to the anterior wall of the sphenoid sinus. In the revision case, inverted papilloma was found in the ethmoids.

In all of these patients following tumor removal, a control biopsy was taken from other parts of the sinus and histologic examinations of these control specimens revealed no disease.

A close follow-up of all patients was maintained with regular endoscopic examinations and CT scans for suspicious lesions. Seventy-seven per cent (10/13) of the patients had no recurrence after initial endoscopic resection. Three patients showed recurrence of the tumor. Therefore, the recurrence rate was found to be 23% (3/13). In one of these patient recurrence and synchronous squamous cell carcinoma developed after 3 years, which means an associated carcinoma rate of 7% (1/13). In this case, the tumor involved the left maxillary sinus wall, the ethmoid sinus and extended to the anterior wall of the sphenoid, whereas the recurrence developed in the maxillary sinus and involved the inferior wall of the orbit and lamina papyracea. Histopathologic examination showed inverted papilloma and associated squamous cell carcinoma. The patient underwent radical maxillectomy and postoperative RT. He has now been followed-up for 1 year without recurrence. In the remaining 2 patients, their tumor extended to the inferior and medial walls of the maxillary sinus in one patient, and to the inferior maxillary sinus wall and inferior turbinate in the other. Their recurrences developed in the ethmoids 11 months later and in the maxillary sinus 9 months later, respectively. In both patients, excision of the recurrent tumors were performed using endoscopes. No evidence of recurrent disease was found in these patients since the endoscopic removal of their recurrent tumors

None of the patients died of an inverted papilloma.

DISCUSSION

The success of inverted papilloma surgery is judged by the recurrence rate of these lesions. Incomplete local resection is regarded as the source of recurrent disease. The follow-up on 13 patients in

this study ranged from a minimum of 9 months to a maximum of 48 months with a mean of 27 months. Eavy (1985) reported that most of the recurrences develop within 6 months after surgery and become less likely after that. In another study, with two exceptions, the recurrences occurred within 24 months after surgery (Waitz and Wigand, 1992). In the present study, the recurrences developed within 11 months after surgery in 2 patients. In the third patient, the recurrence and associated squamous cell carcinoma developed after 36 months. There were no complications noted with any of the endoscopic procedures.

Surgical excision is the recommended treatment of choice for inverted papilloma. Recurrence rates for limited transnasal excision have varied from 17% to 78% (Table 2). Note that intranasal excisions using gross vision have high recurrence rates, but not when an endoscope or microscope was used. Recurrence rates for lateral rhinotomy and medial maxillectomy are within the 13% and 22% range (Table 2). Buchwald et al. (1989) however, noted that even with lateral rhinotomy their recurrence rate was about the same as with excision through sinusectomy (Caldwell-Luc) or a simple endonasal lesion.

With the introduction of nasal endoscopes, localization and more precise excision of nasal diseases can be performed. Kamel's paper is one of the first to indicate the potential for endoscopic excision in the treatment of inverted papilloma (Kamel, 1992). In the same year, Waitz and Wigand (1992) reported a series of 51 patients with inverted papilloma. Thirtyfive of these patients underwent surgery by intranasal endoscopic approach and the recurrence rate was 17%. Stankiewicz and Girgis (1993) presented 15 cases of inverted papilloma. Ten of these cases were treated primarily with endoscopic surgery and the remaining 5 had secondary endoscopic treatment for recurrences. A recurrence rate of 30% for primary tumors treated endoscopically was found. Sham et al. (1998) reported 22 patients treated with endoscopic surgery with a recurrence rate of 27%. Recently, Brors et al. (1999) presented a recurrence rate of 18.2% (4 of 22) after endonasal micro-endoscopic tumor removal. In the present study, a total of 13 patients received endoscopic treatment of inverted papilloma. Although it is difficult to use percentages in a study with such a relative small number of patients, a recurrence rate of 23% was found (3/13). Associated carcinoma developed in one patient (7%). On the other hand, Buchwald et al. (1995) compared three histological types of inverted papilloma. He found that inverted and columnar cell papillomas were located in the middle meatus and adjacent sinuses. The recurrence after radical surgery was 50%. Recurrences have not been found so far after endoscopic approaches in selected cases. On the other hand, exophytic papillomas were typically multicentric and located on the nasal septum. These were resected by a simple endonasal procedure with a recurrence rate of 66%.

Sometimes inverted papillomas may be hidden by inflammatory polyps and arouse no suspicion at first. In a unilateral polyp, if routine endoscopic biopsy was not performed, meticulous complete resection of the lesion during the initial endoscopic procedure should be achieved, since this could be the definitive procedure. During the operation, tumor margins should be evaluated both

in terms of width and depth. Particularly in terms of depth there is controversy for the management of underlying bone. Advocates of endoscopic surgery claims that bone destruction is usually caused by pressure erosion rather than true invasion, so it is not necessary to resect bony borders (lamina papyracea, medial part of the orbital wall, the anterior wall of the maxillary sinus). Resection of the whole layer of diseased mucosa down to the underlying bone with a margin of normal mucosa is sufficient. Additionally, resection of bony margins can provide easier invasion to the extranasal tissues by recurrent tumors. Instead, the underlying bone may be drilled by the diamond burr (Stankiewicz and Girgis, 1993). Proponents of radical surgery recommend an en bloc excision of the lateral nasal wall.

Before considering endoscopic surgery, the patient must be informed about the nature of the disease and the necessity of a close follow-up. Furthermore, the patient must know that the endoscopic approach may be combined with a radical surgery.

The choice of the surgical approach should be made according to the location and extension of the tumor and experience of the surgeon; so far there has been no consensus about the exact indications of endoscopic surgery. Waitz and Wigand (1992) indicated that endoscopic excision of inverted papilloma can be performed even with large lesions involving the posterior ethmoid sinus, the nasofrontal duct and sphenoid sinus. Kamel (1992) concluded that for those lesions not involving the maxillary sinus, endoscopic surgery is effective; however, in cases of maxillary sinus involvement transnasal medial maxillectomy was recommended in Kamel's first report. Later he suggested endoscopic medial maxillectomy for selected maxillary sinus disease (Kamel, 1995). Stankiewicz and Girgin recommended the endoscopic approach for limited inverted papilloma involving the ethmoid sinus, lateral nasal wall, sphenoid sinus and the medial wall of the maxillary sinus (1993). On the other hand, in cases of large papillomas that could not be visualized sufficiently with an endoscope, or with extensive maxillary sinus involvement, or invasion of extranasal tissues and malignant transformation, extranasal approaches must be adopted.

The assessment of endoscopic resectability depends on preoperative endoscopic examination, CT, whenever possible MR imaging, and, more importantly, intraoperative assessment including tumor visualization and accessibility. The assessment of the extent of intrasinus disease by CT scan findings may be exaggerated by secondary sinusitis and inflammatory polyps. A MRI scan allows improved differentiation between a tumor and inflammation. In most of our patients the extent of intrasinus disease was exaggerated by secondary sinusitis, according to the CT scan findings. In these patients, the disease was found to be more limited intraoperatively.

Unlike other techniques, endoscopic operations can be combined with any other approach and be used in postoperative follow-up. Endoscopic follow-up allows early identification of recurrent lesions. Furthermore, revision surgery can be performed under local anesthesia.

The advantages of endonasal surgery are the lack of external scar and potential cosmetic deformity, shorter hospitalization,

less blood loss and direct visualization of the precise extent of the tumor. Unaffected mucosa, as well as the bony wall of the nasal cavity can be preserved.

Endoscopic surgery is a viable treatment alternative in the surgical armamentarium of management of inverted papilloma. However, larger patient populations and longer follow-up periods are needed for more definitive results. Furthermore, there are compulsory preconditions for successful endoscopic surgery of the inverted papillomas such as good preoperative staging, a surgeon experienced in this technique, adequate endoscopic equipment, and a close follow-up of the patients. In the appropriate clinical setting, the endoscopic approach can be used alone or it can be combined with extranasal techniques depending on the tumor location.

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