

Endoscopic Management of Sinonasal Inverted Papilloma

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SUMMARY

Inverted papillomas (IPs) are benign sinonasal epithelial tumors that are locally aggressive and has a preponderance to recur if incompletely excised. This is a retrospective report describing 13 patients who underwent endoscopic excision from March 2004 to December 2010. Data was summarized into age, sex, location of tumor, surgical outcome and disease free status. Majority of the patients were males with the remaining 3 females, with a mean age of 50.9 years (range 24-76 years). Two patients needed an additional procedure of endoscopic dacryocystorhinostomy (EDCR) for epiphora. Out of the 13 patients surveyed, three patients underwent revision surgery for recurrences, of which one was a referred from another institution. All patients are currently disease free. The mean follow-up period is 40 months.

KEY WORDS:

Inverted Papilloma, Endoscopic sinus surgery, Benign tumor

INTRODUCTION

Inverted papillomas (IP) are benign and locally aggressive tumors. They are usually unilateral, bulky, vascular masses that tend to recur if incompletely excised. They represent 70% of all sinonasal papillomas, comprising between 0.5-7% of all primary nasal tumors¹. It has a strong male preponderance, showing a 3.4:1 male/female ratio, predominant in adults in the 5th-6th decades of life². The exact etiology is not well understood, although human papilloma virus presence with chronic inflammation have been implicated as possible contributing factors^{3,4}.

It has a strong preponderance to recur and could form hybrid tumors harbouring squamous cell carcinoma². Synchronous carcinoma have been reported to occur between 1.7% and 56%^{2,5}. Therefore complete surgical excision is advocated. Several studies have demonstrated the efficacy of endoscopic approach in the management of sinonasal IPs^{6,7}. Endoscopic approach has numerous advantages including excellent visualization, preservation of normal mucosa, avoiding external incisions and also facilitates post-operative surveillance in an out-patient setting⁷.

MATERIALS AND METHODS

All patients presenting with IP to our institution from March 2004 to December 2010 were reviewed. Data was obtained from clinic and surgical records. Data points include age, sex, location of tumor, staging, disease free state and

hospitalization days. The surgical treatment, complications, recurrence rates and follow up period is described.

There was a total of 13 patients with inverted papillomas arising from various sites of the lateral nasal wall. All patients underwent endoscopic excision of the tumor. Two of these patients also had an EDCR during the same setting. Three patients had recurrence and needed revision surgery, of which one was referred from another institution.

Surgical Technique

A standard medial maxillectomy involves the following steps:-

- (i) Uncinectomy
- (ii) Mega antrostomy
- (iii) Inferior Turbinectomy
- (iv) Mucosa over medial wall of maxilla debrided
- (v) Either drill down the bony wall with a cutting/diamond burr or use a chisel

RESULTS

A total of 13 patients underwent endoscopic excision of the tumor. Ten were males with the remaining 3 females with a mean age was 50.92 years (range 24-76 years). The maxillary sinus was involved in all cases (Figure 1). Other sites of involvement were the bulla ethmoidalis, 10 cases, the middle turbinate in two cases, the frontal recess in 4 cases and the sphenoid sinus in one case. (Table I). Two patients had a recurrence twice and needed revision endoscopic excision to render them tumor free. We had one patient that was operated in another institution that presented with Krouse stage III. Endoscopic medial maxillectomy and a complete fronto-ethmoidectomy was performed.

Intraoperative frozen section was done for all patients to ensure adequate tumor resection with tumor free margins. Despite this, recurrence occurred in two cases. Histopathologic examination confirmed the diagnosis of inverted papilloma in all cases. All tumor specimens were free of dysplastic or carcinomatous change.

Tumors were staged according to Krouse system I –IV (Table II). Seven patients were staged in Krouse II and the other 6 patients in Krouse Stage III. Endoscopic medial maxillectomy was done for all patients (Figure 2). Two patients additionally required a fronto-ethmoidectomy. There was no intra-operative complications. The mean post-operative follow up period was of 40 months and mean hospitalization was 3.15 days.

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Table I: Age, Sex, Origin, Stage, Procedure, Disease free and Hospitalization days

No.	Age/Sex	Origin	KROUSE Staging	Endoscopic procedure	Current follow up	Hospitalization (Days)
1	35/M	Maxillary sinus- Medial wall	KROUSE II	Medial Maxillectomy	Disease free 6.2 years	3
2	59/M	Maxillary sinus-- Medial wall Ethmoidal Bulla	KROUSE II	Medial Maxillectomy Ethmoidectomy	Disease free 5.4 years	3
3	42/M	Maxillary sinus- Medial wall Ethmoidal Bulla Middle Turbinate	KROUSE II	Medial maxillectomy Ethmoidectomy Partial Middle Turbinectomy	Disease free 5.4 years	3
4	62/M	Maxillary sinus-- Medial wall Ethmoidal Bulla	KROUSE II	Medial Maxillectomy Ethmoidectomy EDCR	Disease free 4.9 years	3
5	58/F	Maxillary sinus-- Medial wall Ethmoidal Bulla Frontal Recess	KROUSE III	Medial Maxillectomy Ethmoidectomy Frontal Recess Clearance EDCR	Disease free 4.3 years	4
6	32/M	Maxillary sinus-- Medial wall Anterior & Posterior Ethmoids Sphenoid Sinus Frontal Recess	KROUSE III	Medial Maxillectomy Fronto-Ethmoidectomy	Recurred after 1.3 years at Frontal Recess & Sphenoid Revision Endoscopic Surgery done (ESS) 2nd Revision surgery done after 6 months- Recurrence at Frontal Recess & Skull base Now disease free for 2 years	4
7	52/M	Maxillary sinus-- Medial wall Ethmoidal Bulla	KROUSE II	Medial Maxillectomy Ethmoidectomy	Recurred after 2.2 years Revision ESS done, disease free 4 months	3
8	52/M	Maxillary sinus- Medial wall & Roof Bulla Ethmoidalis	KROUSE III	Medial Maxillectomy Ethmoidectomy	Disease free 2.4 years	3
9	64/M	Maxillary sinus- Medial wall Bulla Ethmoidalis	KROUSE II	Middle Maxillectomy, Ethmoidectomy	Disease free 2.4 years	3
10	52/M	Middle meatus and roof of maxillary sinus	KROUSE III	Medial Maxillectomy	Disease free 1.6 years	3
11	24/F	Maxillary sinus- Medial & Antero- lateral Wall Bulla Ethmoidalis Frontal Recess	KROUSE III	Medial Maxillectomy Ethmoidectomy Frontal Recess Clearance	Disease free 2 years	3
12	54/M	Residual Tumor arising from anterolateral wall of maxilla Bulla Ethmoidalis and Frontal Recess	KROUSE III	Medial Maxillectomy and Fronto-ethmoidectomy	Disease free 1.4 years	3
13	76/F	Maxillary sinus- Medial Wall Middle turbinate	KROUSE II	Medial Maxillectomy Middle Turbinectomy	Disease free 1 year	3

Table II: Krouse staging system for inverting papilloma⁸

T1	Tumor isolated to one area of the nasal cavity without extension to paranasal sinuses
T2	Tumor involves medial wall of maxillary sinus, ethmoid sinuses, and/or osteomeatal complex
T3	Tumour involves the superior, inferior, posterior, anterior, or lateral walls of the maxillary sinus, frontal sinus; or sphenoid sinus
T4	Tumor with extrasinonasal extent or malignancy

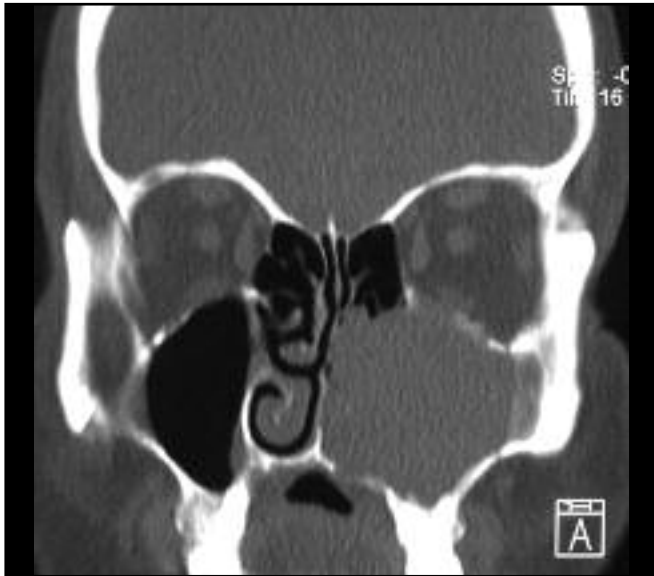


Fig. 1: Soft-tissue density consistent with IP in the left maxillary sinus and also involving the bulla ethmoidalis



Fig. 2: Post-Operative tumor surveillance. The left maxillary sinus can thoroughly be inspected with a 70 degree endoscope after a medial maxillectomy



Fig. 3: Post-operative Coronal CT Scan showing no tumor recurrence and a complete (L) medial maxillectomy done

DISCUSSION

The three principal aims of sinonasal tumor excision is firstly, to create adequate and sufficient exposure for complete resection, secondly, to provide an unobstructed view for postoperative surveillance of the cavity, and thirdly, minimize cosmetic deformities and functional disabilities. Endoscopic excision achieves all these objectives. Inverted papilloma often demonstrates aggressive local invasion with high recurrence rates if incompletely excised, as well as a potential for harboring squamous cell carcinoma² Therefore, it is imperative that these lesions be treated aggressively as one would in a similar case of squamous cell carcinoma.

Traditionally, IPs have been treated with en bloc resection via lateral rhinotomy and medial maxillectomy. There is higher morbidity involving external approaches which includes external scarring, blepharitis, diplopia, intermittent dacryocystitis, CSF leak and facial neuralgia⁷.

With the advent of endoscopic approaches, IPs can effectively be managed with less morbidity and favorable outcomes^{6,7}. Our experience concurs with these published reports. Treatment success depends on exact tumor site location, its extent defined, and removal of all mucosa and underlying bone⁶.

Endoscopic management allows unparalleled visualization, avoids external scar and preserves mucociliary physiology. It allows angled visualization facilitating complete tumor resection even in unfavorable sites. The use of microdebriders and diamond burrs combined with endoscopic excision helps to remove underlying bone so that microscopic inverted papilloma can be thoroughly removed¹.

The reported recurrence rate of inverted papillomas after endoscopic resection is comparable or even lower to that of the standard technique of lateral rhinotomy and medial maxillectomy^{2,6,7}. Post operatively endoscopic management also facilitates regular examination in outpatient setting for post-operative surveillance of tumour bed.

It is important to have a detailed preoperative assessment of the extent of the lesion with CT and/or MRI which helps in determining any invasion to the orbits or base of skull erosion. In addition, the skill and experience of the surgeon with regard to the procedure is also important.

Post- operative follow up is essential to detect early recurrences. In this study we have a mean follow up of 40 months where all patients are followed up are endoscopically examined in an out-patient setting (Figure 2). Any suspicious

tissue should be biopsied for early detection of recurrence. If necessary CT/MRI scans (Figure 3) are done for location and extent of residual tumor.

CONCLUSION

In our study, endoscopic excision of inverted papilloma is proven to be a viable option in the management of inverted papillomas. Appropriate preoperative assessment includes clinical and radiological evaluation. Currently, endoscopic techniques have proven to be an accepted modality of treatment in excising sinonasal IPs. It has demonstrable minimal morbidity and low recurrence rates. Endoscopic approach also facilitates post-operative surveillance in an out-patient setting for early tumor recurrence.

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