

Management of Sinonasal Inverted Papillomas: Endoscopic Medial Maxillectomy

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SUMMARY

Inverted papillomas (IPs), although histologically benign, are aggressive lesions that may recur after excision. They usually present as unilateral firm, bulky, red and vascular masses. The objective of this case series is to discuss the surgical treatment options for IPs and to review the literature with a special emphasis on our experience with endoscopic medial maxillectomy. A retrospective review of the data of patients with IP treated by endoscopic medial maxillectomy was performed. This report describes the surgical experience with five patients with IP arising from various sites on the lateral nasal wall. Data points collected included age, sex, location(s) and histopathological diagnosis (benign IP vs IP with dysplasia or carcinoma). The surgical treatment strategy, need for adjunct approaches, complications, recurrence rates and length of follow-up were determined. The average age was 51.2 years (range, 35-62 years), with four males and one female. All cases were managed with endoscopic medial maxillectomy as the primary surgical modality. Adjunctive approaches included endoscopic dacryocystorhinostomy (EDCR) in two patients who presented with epiphora post-operatively. Intra-operative frozen section was performed in all cases to ensure complete tumor removal. No intra-operative complications were encountered. No recurrences were noted in these patients, with a mean follow-up period of 23 months.

KEY WORDS:

Benign Tumors, Inverted papilloma, Endoscopic medial maxillectomy

INTRODUCTION

Inverted papilloma (IP) are benign sinonasal epithelial neoplasms of the pseudostratified ciliated columnar epithelium that lines the lateral nasal wall. Although uncommon in the general population, papillomas comprise between 0.5% and 4% of primary nasal tumors¹. The peak age of presentation is the 5th and 6th decades, with a strong male preponderance². Despite being benign, IPs may demonstrate aggressive local invasion with a propensity for recurrences after incomplete excision, as well as a potential for harbouring squamous cell carcinoma².

Therefore complete surgical excision is advocated. Lateral rhinotomy and medial maxillectomy served as the workhorse approach for many decades. Several studies over the past decade have demonstrated the efficacy of the endoscopic

approach in the management of neoplasms^{3,4}. The use of endoscopes have distinct advantages in terms of unparalleled visualization, avoids external incisions, preserves normal mucociliary physiology and facilitates regular endoscopic examination in the outpatient setting for postoperative surveillance⁴.

MATERIALS AND METHODS

Retrospective data review was performed on patients presenting with IP from July 2005 till July 2007. A total of five patients with IP presenting from various sites on the lateral nasal wall was included in this review. Data points collected included age, sex, location(s) and histopathological diagnosis (benign IP vs IP with dysplasia or carcinoma). The surgical treatment strategy, need for adjunct approaches, complications, recurrence rates and length of follow-up were determined.

RESULTS

A total of five patients underwent endoscopic resection of IP from July 2005 till July 2007. The average age was 51.2 years (range, 35-62 years), with four males and one female (Table I).

The maxillary sinus is involved in all cases (Figure 1). The tumour also involved the anterior ethmoids in four cases and the frontal recess and middle turbinate in one case (Table I). There was no involvement of posterior ethmoids, sphenoid sinuses, skull base or the orbit in all cases. Tumours were staged from I to IV according to the Krouse staging system. Four were in stage II and one was in stage III (Table I). The histologic diagnosis was IP without any evidence of dysplasia or squamous cell carcinoma in all five cases (Figure 2).

All cases were managed with endoscopic medial maxillectomy as the primary surgical modality. Adjunctive approaches included EDCR in two patients who presented with epiphora post-operatively. Intra-operative frozen section was performed in all cases to ensure complete tumour removal. No intra-operative complications were encountered. No recurrences were noted in these patients, with a mean follow-up period of 23 months (Table I).

DISCUSSION

Inverted papilloma despite their benign histological appearance, often demonstrates aggressive local invasion

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Table I: Origin, Stage, Procedure, and Outcome for Endoscopic Medial Maxillectomy for Inverted Papilloma

Case	Age/Sex	Origin	Krouse Staging	Endoscopic Procedure	Current Follow-up
1	59/M	Maxillary Sinus Ethmoidal Bulla	II	Medial Maxillectomy Ethmoidectomy	Disease free 2 years
2	35/M	Maxillary Sinus	II	Medial Maxillectomy	Disease free 3 years
3	42/M	Maxillary Sinus Ethmoidal Bulla	II	Medial Maxillectomy Ethmoidectomy	Disease free 2.1 years
4	62/M	Middle Turbinate Maxillary Sinus Ethmoidal Bulla	II	Partial Middle Turbinectomy Medial Maxillectomy Ethmoidectomy	Disease free 1.6 years
5	58/F	Maxillary Sinus Ethmoidal Bulla Frontal Recess	III	DCR Medial Maxillectomy Ethmoidectomy Clearance of Frontal Recess DCR	Disease free 1year

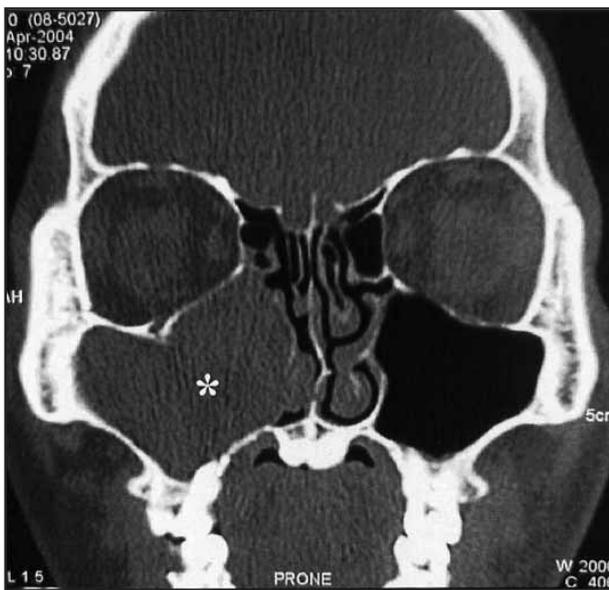


Fig. 1: Coronal CT demonstrating soft-tissue density consistent with IP in the right maxillary sinus (*).



Fig. 2: Hematoxylin and eosin stained sections of IP at low power (magnification x10). Thin arrow showing the surface epithelium, large arrow showing the stroma and dotted arrow showing the nest of squamous epithelium.

with a propensity for recurrences after incomplete excision, as well as a potential for harboring squamous cell carcinoma². These tumors must be treated aggressively as one would in a similar case of squamous cell carcinoma.

Therefore with all of the above described characteristics, a complete surgical resection with curative intent is the recommended treatment modality for these tumors. The traditional treatment for IP has been en bloc resection via lateral rhinotomy and medial maxillectomy approach. With the advent of minimally invasive endoscopic approaches, many authors have reported favorable outcomes and disease control using endoscopic techniques^{3,4}. The present series demonstrates that sinonasal IP can be effectively treated endoscopically. Successful treatment is more likely if the specific origin of the tumor is identified, its extent defined, and all involved mucosa and underlying bone removed³.

In order to choose the best surgical approach for the resection of IP, it is more important to determine the site of origin and

the extent of tumor. In recent years the focus of debate has been on determining which approach is superior, when comparing endonasal versus external approach. Transnasal operations had high recurrences due to the poor illumination and visualization. Despite the reported lower recurrence rates there is a higher morbidity involving external approaches like the classical lateral rhinotomy which includes epiphora, dacryocystitis, mucocele, epistaxis, cerebrospinal fluid leak, facial neuralgia, and external scarring.

Endoscopic surgery provides superior magnification, illumination, no facial scarring, superior cosmesis and angled visualization facilitating complete endonasal tumor resection even in unfavorable sites such as the anterior or lateral wall of the maxillary sinus and the alveolar recess^{3,4}. Tumor and adjacent mucosa and bone can be removed with powered microdebriders and diamond burr³. In contrast to many external approaches, preservation of normal sinonasal physiologic function and mucociliary clearance patterns is achieved with the endoscopic approach. Consideration of

the endoscopic approach is also based on the presenting pathology, surgeon's experience with advanced endoscopic techniques and appropriate surgical instrumentation. Surgical navigation when available is helpful in defining intricate intra-operative anatomy⁴.

Therefore, this series demonstrates the feasibility of the endoscopic resection of maxillary sinus, anterior ethmoids and the frontal recess. Complete excision of all tumors was achieved in all cases. Recurrence has not been noted in these five cases at a mean follow-up period of 23 months.

Radiography is important in the evaluation of patients with inverted papilloma as it allows one to assess the extent of disease and the presence of bony erosion or invasion into adjacent structures such as the base of skull or the orbit. These changes may suggest the presence of an associated malignancy, thus altering the management. Although CT scanning has improved the ability to plan surgical resection of IP but MRI has a distinct advantage over CT in defining the extent of IP and differentiating it from retained secretions and sinusitis³. However, neither, CT or MRI is able to differentiate foci of coexistent squamous cell carcinoma from IP³.

Although many tumours are initially unifocal, inadequate removal may promote multifocality. Most recurrences occur early and at the site of the original tumor, strongly suggesting that incomplete local resection is the main cause of recurrent disease². The staging system proposed by Krouse⁵ has unified the staging system and made it easier to compare the surgical approaches and the recurrence rates. All our patients were staged according to the Krouse⁵ staging system. Recurrent IP's are associated with increased risk of squamous cell carcinomas and reported rates vary from 2% to 53%². Due to the possibility of secondary malignant transformation, long-

term follow-up of patients must be performed by nasal endoscopy and, if necessary, by CT and MRI scans. Any suspicious tissue should undergo biopsy for early detection of recurrent disease.

CONCLUSION

Inverted papilloma is a benign sinonasal lesion that most commonly arises on the lateral nasal wall with a high incidence for recurrence and local aggressiveness. Appropriate preoperative assessment includes clinical and radiological evaluations, which provides an accurate picture of the lesion. Complete removal of the lesion offers the best chance of minimizing recurrence.

However, recent experience has shown that endoscopic management is an acceptable treatment strategy resulting in minimal morbidity and low recurrence rates. Careful preoperative planning with proper imaging studies and meticulous surgical technique are absolute necessities for successful management of these difficult tumors. In our small series of patients, endoscopic management has proven to be a viable option of treating sinonasal papillomas.

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