

## Inverted Papilloma a Retrospective Study of 17 Cases

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### Abstract

Complete surgical excision of inverted papilloma of nasal cavity is challenging owing to high chances of recurrence following removal. However the advent of nasal endoscope has provided a new avenue for removal of these tumors. We report 17 cases of inverted papilloma which were either removed via an endoscopic route or via endoscope aided external approach. There was no recurrence in any of the cases over a 2 year followup period.

**Keywords:** Inverted Papilloma; Endoscope.

### Introduction

Inverted papillomas are an enigma to the surgeon owing to their locally aggressive behaviour, propensity for malignant transformation and have high recurrence rates following removal. The main goal of treatment is complete surgical excision without any scope for recurrence. Excision using external approaches [1] is now being replaced by endoscopic resection. We report 17 cases of inverted papilloma of nasal cavity treated by endoscopic and endoscopic assisted open approach. There was no recurrence in a followup of 2 years. The purpose of this study was to highlight the use of endoscope in successful management of inverted papilloma.

### Materials and Methods

17 cases of histologically proven inverted papilloma managed in our department over a 5 year period (2010-2015) were retrospectively considered for this study to (2010-2014).

### Results

In this retrospective study we analysed 17 cases of inverted papilloma regarding its clinical behaviour, extent of disease, approach adapted for surgery, recurrence rate and rate of malignant transformation.

In this study the most commonly affected age group was between 50 to 60 years; 7 out of 17(41%). Male to female ratio in this series was 16:1(16males and 1 female).

Age group	No. of patients
30-40	1
40-50	5
50-60	7
60-70	4

Most of the patients presented with nasal obstruction 12(70 %) and epistaxis 09 (52 %).

Symptomatology	No. of patients
Nasal obstruction	12
Epistaxis	09
Nasal mass	06
Swelling over cheek	01

4 patients were recurrent cases with previous history of functional endoscopic sinus surgery being present. Clinical examination revealed nasal mass arising from the lateral nasal wall in all the cases. All the patients underwent radiological evaluation by CT/MRI PNS to assess the extent of disease.

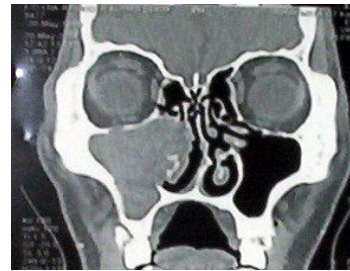
Majority of the cases were found to involve the maxillary sinuses along with the nasal cavity 7 cases (41%) (Figure 1). Mass was attached to middle turbinate in 1 case. Maxillary sinus with ethmoid involvement was seen in 4 cases on CT PNS and maxillary with ethmoid and frontal and sphenoid involvement on CT PNS was seen in 3 cases. In 1 case the mass was found breaching the septum and crossing over to involve the opposite side on CT PNS (Figure 2). In 1 case mass was found entering ant cranial fossa (extradural extension).

Patients were staged as per Krause's staging of inverted papilloma. 1 patient was in Krause stage 1 and 7 cases were in Krause stage 2 and 8 in stage 3 and 1 in stage 4. Out of 17 cases 5 (with frontal and sphenoidal/ant cranial fossa/involvement of opposite side) of which 4 cases were recurrent cases underwent an open approach for surgery - 4 cases underwent open medial maxillectomy/medial maxillectomy with frontoethmoidectomy and 1 case anterior craniofacial resection was done. In doing an external medial maxillectomy a lateral rhinotomy approach was used with Lynch extension for frontoethmoidectomy and standard bone cuts for medial maxillectomy were taken. After excision of the mass in all these 5 cases cases 0 and 30 degree 4mm nasal endoscope was introduced through the incision and an angled micromotor hand piece with diamond burr used to aid in subperiosteal dissection and entire mucoperiosteal lining of cavity removed. 12 cases were taken up for surgery through the endoscopic endonasal route. Nasal part of the mass (Figure 3) was removed using a microdebrider. Uncinectomy was done and mass which was found involving the middle meatus and maxillary sinus was removed and its attachment was widely excised. Middle meatal antrostomy done. Middle and inferior turbinate were removed. Maxillary antrum was enlarged posteriorly till the posterior wall of maxillary sinus. Entire maxillary sinus including entire medial wall of maxillary sinus removed and medial maxillectomy done. Anterior and posterior ethmoidectomy was done. Entire maxillary sinus including anterior wall and floor was visualised using a 4mm angled 45 degree endoscope. Removal of the medial maxillary wall enabled removal of the tumor origin. Sphenoidotomy was done and frontal recess was cleared. At the remaining site of

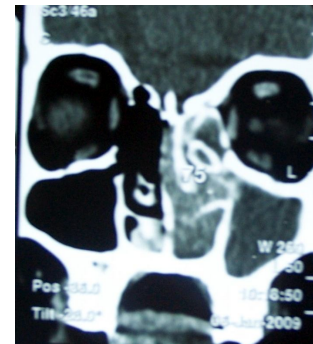
attachment subperiosteal dissection was done and drilling was done with a diamond burr.

Histopathology of 16 cases was of inverted papilloma. Histopathology of the mass (fig 4) showed inverted proliferation of squamous epithelial cells with some mucus secreting cells and microcysts. Occasional mitosis was seen in basal layer. Subepithelial fibrous stroma was edematous with neutrophils and contains congested capillaries. The tumor cells were polygonal with round to oval vesicular and inconspicuous nucleoli. Diagnosis was of inverted squamous cell papilloma. 1 case on histopathology was of transitional carcinoma and all margins were free on open medial maxillectomy. Patient was subsequently sent for postoperative radiation.

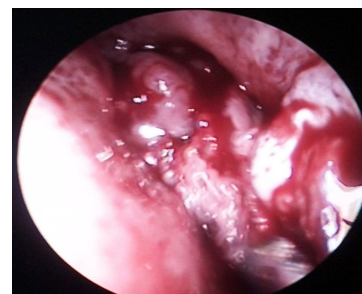
Followup was done by serial nasal endoscopy monthly and imaging every yearly. Followup over 2 years revealed no recurrence in any of the 17 cases. 1 patient had complaints of excessive nasal crusting which was treated with saline nasal douching.



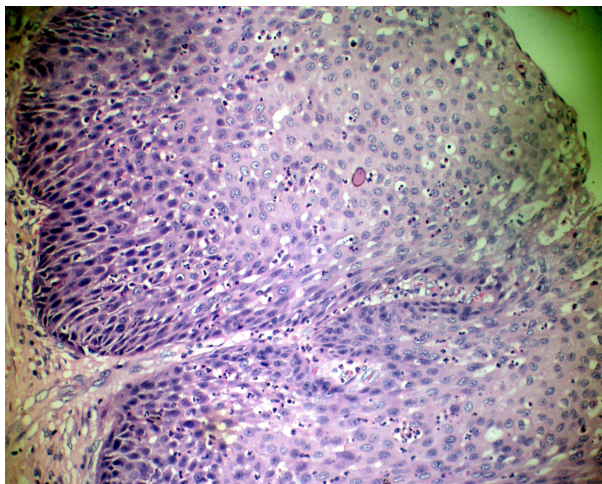
**Fig. 1:** CT scan image showing the involvement of nasal cavity and maxillary sinus



**Fig. 2:** CT scan image showing the mass eroding the septum and crossing over to the opposite side



**Fig. 3:** Endoscopic image of inverted papilloma



**Fig. 4:** Low power histopathology image H&E Stain of inverted papilloma

## Discussion

Schneiderian papillomas account for .4-4.7% of all sinonasal tumors. Human papilloma virus is implicated in the development of these papillomas [2]. These papillomas are of 3 types-fungiform, inverted & cylindrical cell. Inverted papillomas account for 47% of all sinonasal papillomas. They are most common in men aged 40-70 years. Common sites of origin of inverted papilloma are the lateral nasal wall in the region of middle turbinate and ethmoid sinus. Less common sites are nasopharynx, oropharynx, middle ear, nasal septum, lacrimal system, frontal and sphenoid sinus. Although histologically benign inverted papillomas are locally aggressive and can invade paranasal sinuses, nasopharynx, occasionally orbit and even brain. Inverted papilloma is frequently multicentric and there is a 3% to 24% (average 13%) incidence of coexisting carcinoma mostly squamous cell [3]. Although a benign entity the three main clinical characteristic attributes of inverted papillomas are they are locally aggressive, may harbour coexisting malignancy and have the tendency to recur and hence the main goal of treatment is complete surgical excision. This minimises risk of recurrence and allows comprehensive evaluation of the specimen for the presence of any coexisting malignancy.

Recurrence rates vary from 5 to 75% depending on surgical approach and completeness of surgical excision. Although multicentricity of tumor has been suggested to be responsible for high recurrence, inadequate tumor removal during initial resection seem to be the most important predictive factor for local recurrence [1]. In this study we carried out resection of this mass using either using an

endoscope or assisted by an endoscope to ensure complete resection of the tumor and complete removal of periosteal lining and had no recurrences during the period of followup.

There is evidence that the tumor recurs after inadequate removal Lund V [4] in their paper state that that the outcome of treatment relates to how thoroughly the diseased mucosa is removed. Aggressive early management with medial maxillectomy by using external approach either with lateral rhinotomy or midfacial degloving has reduced the recurrence rate to 0 to 29% [2]. However these external approaches may come with significant morbidity associated with it such as scarring, ectropion, nasocutaneous fistula and vestibular stenosis.

In the past decade an increasing number of authors have reported endoscopic resection of inverted papilloma and have reported success and recurrence rates similar to open approaches. Wormald et al [5] in their series of 17 patients with inverted papilloma treated endoscopically had only 1 recurrence (6%) and that particular patient was subsequently found to have sinonasal carcinoma. Klimek T [6] in their study of 55 patients of inverted papilloma found that the recurrence rates in patients who had undergone endonasal excision 6 out of 33 (18%) were the same as those in whom lateral rhinotomy or medial maxillectomy had been carried out (4 out of 22). The principle of endoscopic sinus surgery involves disassembling the lesion in oriented blocks and carrying out the dissection is carried out in a subperiosteal plane. An added advantage is all the involved subsites with microinvasive squamous cell cancer can be located at definitive histology.

Such evidence should have propelled surgeons to adopt endoscopy as the technique of choice however endoscopic method is still shrouded in criticism. The validity of comparison between endoscopic surgeries with those of external approach in management of inverted papilloma has been faulted due to perceived patient bias in patient selection for the procedure. This is because patients who were selected for the endoscopic approaches usually have limited disease. Due to inadvertent selection of patients with lesser disease for endoscopic treatment have rendered comparisons between the external and endoscopic approaches invalid. Advocates of endoscopy proposed criteria for selection of patients. Klimek T[6] recommended that endonasal excision should be carried out in those inverted papilloma limited to nasal cavity, middle and posterior parts of ethmoid involving the sphenoid and the medioposterior wall of maxillary sinus. Stankiewicz [7] recommended that

endoscopic approach be used for disease that is limited to the ethmoid or sphenoid sinuses, the lateral nasal wall and the medial wall of the maxillary sinus. However this criteria for selection was refuted in other studies. Lee TJ [8] in their study of 43 patients with inverted papilloma endoscopic techniques could be applied in extensive lesions and that proper preoperative evaluation, intraoperative determination of extent and attachment of tumor, expert application of endoscopic techniques and close endoscopic followup were the key to successful endoscopic treatment of inverted papilloma.

Combined approach has been used in 11 out of 212 cases of inverted papilloma [9] using an Osteoplastic flap approach along with transnasal endoscopic approach in those which had extensive mucosal involvement inside a supraorbital cell extending far laterally over the orbit or massive involvement of frontal sinus mucosa.

Stankiewicz JA [7] in a review of the surgical anatomy in the regions of recurrences showed that the most common sites of recurrence are the lateral nasal wall in region of middle meatus, the nasofrontal duct area, the supraorbital ethmoidal cells, the region of lacrimal fossa and the infraorbital or prelacrimar recess of the maxillary sinus. There was a recurrence rate of 5.7% in a series of 212 patients done by Lombardi et al [9]. Recurrences occurred at the site of origin of lesion following pure endoscopic removal. There was no statistically difference in recurrences based on site [9].

Close followup of patients is mandatory because recurrence may be associated with malignancy. Keles N et al [10] in their study of 13 cases of inverted papilloma treated with endoscopic sinus surgery found that 3 patients had recurrence at mean followup of 27 months (9 to 48 months). In 2 patients recurrences were treated endoscopically and in 1 patient recurrence with malignant transformation occurred at 36 months for which he had to undergo radical maxillectomy.

In our study 15 patients had Krause stage T2 or T3 disease. We used the endoscopic approach in 1 case of Krause stage T1 and 7 cases of Krause stage 2 and 4 cases of Krause stage 3. Rest 4 cases of Krause stage 3 which were recurrent cases we used an external approach for removal. We adopted the use of endoscope in all the external approaches to enable visualisation of the possible micro invasive subsites. We followed up the cases for 2 years but found no recurrence.

There is no clear cut consensus on the best surgical approach to nasal inverted papillomas. The

advantages of the endoscopic approach however are not debatable. Reduced morbidity makes the approach advantageous. Magnified visualization of sites of invasion during surgery is an added advantage. The technique is aided by improved and powered surgical instruments. The advantage of use of endoscope along with the open approach ensures the completeness of resection. In conclusion use of endoscope in the excision of inverted papilloma provides for a safe and effective treatment of management of inverted papilloma.

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