CLINICAL STUDY ON SURGICAL MANAGEMENT OF INVERTED PAPILLOMA

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ABSTRACT: Inverted papilloma are the most common sinonasal tumors with a tendency for recurrence, extension to the orbit and skull base, and risk of malignant degeneration into squamous cell carcinoma While the overall rate of recurrence has decreased with the widespread adoption of high-definition endoscopic optics and advanced surgical tools, there remain challenges in managing tumors that involve vital neurovascular structures. Here we review the clinical features, diagnostic tools for these tumours, contemporary surgical management, and regular follow up.

BACKGROUND: Inverted papilloma represents a unique group of benign lesions that arise from the mucosal surfaces of the sinonasal tract. It is characterised best by its multicentricity, local invasion, tendency for recurrence and association with malignancy. Management of inverted papilloma is important because of its characteristics of local invasion, tendency to recur after removal and its association with malignancy which make these rare tumors important. Surgery is the main modality of inverted papilloma. It can be open transnasal or endoscopic surgery. Open procedure was considered as gold standard treatment of inverted papilloma. With advancement in endoscopic nasal surgery, inverted papilloma can be excised endoscopically with recurrence rates similar to those open procedures in selected patients.

MATERIAL AND METHODS: Analysis of data for the last one year of the patients presenting to one of the Government Hospital in ENT department. The selected patients are subjected to a detailed History, Physical examination and complete ENT examination. Past history of any nasal surgery is emphasized. Pre-operative diagnostic nasal endoscopy is done for all patients. Computerised tomography scan nose and paranasal sinuses is taken in all patients. Pre-operative biopsy is taken for all patients. Resected specimen is sent for HPE to confirm diagnosis to rule out coexisting carcinoma. Post operative nasal packing is done using soframycin pack. Patients are given saline nasal douching and nasal sprays for 2 months in postoperative period. Follow up done 2 weeks, 4 weeks, 3months and 6 months interval time period. Diagnostic nasal endoscopy is done at each follow up and all suspicious lesion are biopsied and sent for HPE.

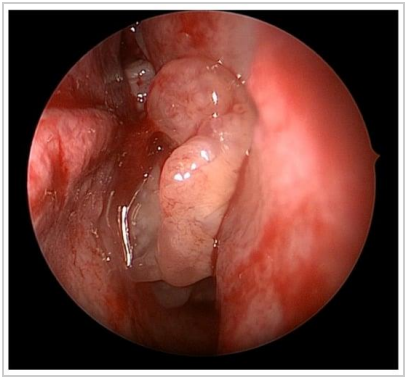
RESULTS: For all the fifteen patients the surgery done was successful with no recurrence or malignant transformation on follow up till six months to one year.

CONCLUSIONS: Inverted papilloma has a tendency to invade the surrounding bone and it can be associated with malignancy which can be present along with it or may arise in previous focus of inverted papilloma after excison. Diagnostic nasal endoscopy and CT scan is important in assessing the site of origin and extent of involvement of surrounding structures and planning the surgery. Surgery can be done by open or endoscopic approach.[6,7,8,9] Powered instrumentation is extremely useful to achieve good results. Timely post operative follow up with diagnostic nasal endoscopy and biopsy of suspected lesions is important for early detection of recurrences and malignant transformation.

KEYWORDS: Inverted papilloma, Schneidarian papilloma, endoscopic approach, microdebrider.

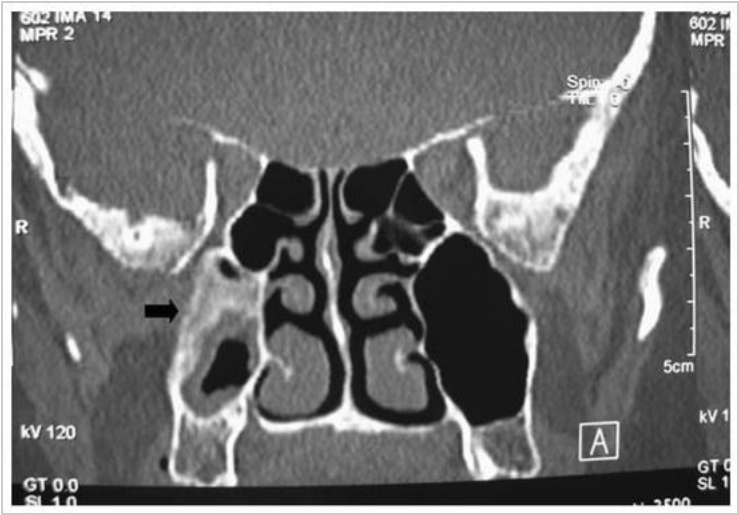
INTRODUCTION: Tumours of nose and paranasal sinuses are rare head and neck tumours comprising only 3%of all head and neck tumours.[3-5] Benign tumours of nose and paranasal sinuses are a histologically diverse group of neoplasms. Schneiderian papillomas are relatively uncommon benign tumours of the nasal cavity and paranasal sinuses, comprising 0.5-4% of all primary nasal tumors. Inverted papillomas accounts for approximately 70%of all the Schneiderian papillomas and represents a unique group of benign lesions that arise from the mucosal surfaces of the sinonasal tract. The term inverting papilloma was coined by Ringertz. It is characterised best by its multicentricity, local invasion, tendency for recurrence and association with malignancy. It has many synonyms- epithelial papilloma, fungiform papilloma, transitional cell papilloma, Squamous cell papilloma, papillary sinusitis, soft papilloma, cylindrical cell papilloma, polyp with inverting metaplasia, Ewing's papilloma.

Figure showing tumour mass in the nasal cavity



OBJECTIVES: Management of inverted papilloma is important because of its characteristics of local invasion, tendency to recur after removal and its association with malignancy which make these tumours important. Surgery is the main modality of treatment of inverted papilloma.
To select the appropriate surgical approach based on extent of the disease on clinical and radiological examination.
To estimate the recurrence rate in various surgical approaches.
To estimate the malignant transformation rate.

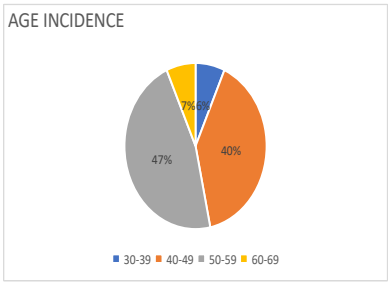
IMAGING: Preoperative imaging is routinely obtained to evaluate the extent of the tumor and assist in surgical planning. Non-contrast computed tomography scans with thin cuts (<1 mm) are standard protocol to evaluate for areas of bony erosion, although findings typically demonstrate a non-specific soft tissue density with microcalcifications present in 20% of cases. CT is particularly sensitive at detecting areas of hyperostosis, which has been used to predict the site of tumour attachment with positive predictive values of 89–95% reported. This finding on imaging can be confirmed with diagnostic nasal endoscopy.



CT scan nose and paranasl sinuses , coronal view showing opacity of the lesion in right maxillary sinus.

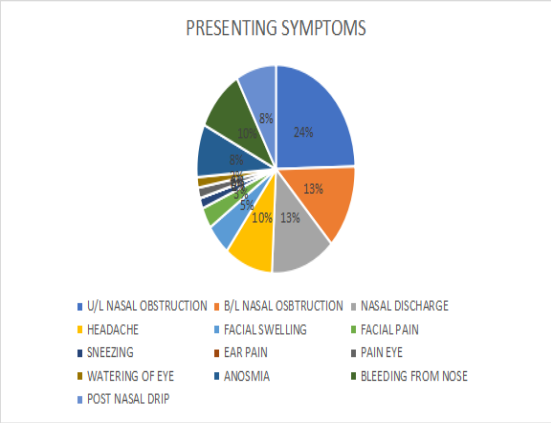
OBSERVATIONS AND RESULTS :15 cases of inverted papilloma were studied
1.Age incidence

Age	No. of cases	Total cases
0-9	0	0
10-19	0	0
20-29	0	0
30-39	1	15
40-49	6	15
50-59	7	15
60-69	1	8
70-79	0	0



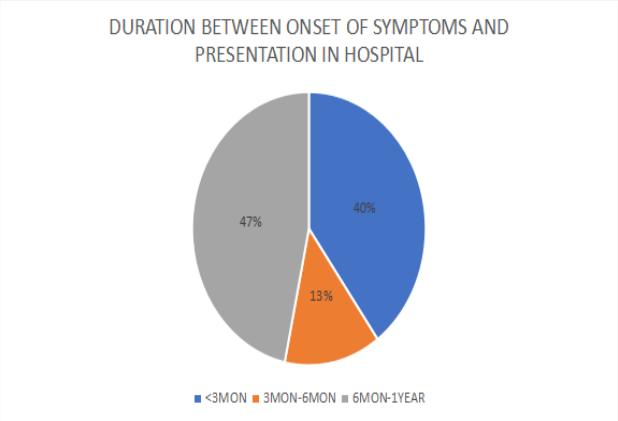
2. Presenting symptoms

Symptoms	**No.of patients**	**Percentage**
U/L nasal obstruction	15	100
B/L nasal obstruction	8	53.3%
Nasal discharge	8	53.3%
Headache	6	40%
Facial swelling	3	20%
Facial pain	2	13.3%
Sneezing	1	6.6%
Ear pain	0	0
Pain eye	1	6.6%
Watering of eye	1	6.6%
Anosmia	5	33.3%
Bleeding from nose	6	40%
Post nasal drip	5	33.3%



3. **DURATION BETWEEN ONSET OF SYMPTOMS AND PRESENTATION IN HOSPITAL**

DURATION	**NO. OF PATIENTS**	**PERECENTAGE**
<3 months	**6**	**40%**
3 months -6months	**2**	**13.3%**
6months-1year	**7**	**46.6%**



STAGING OF INVERTED PAPILLOMA

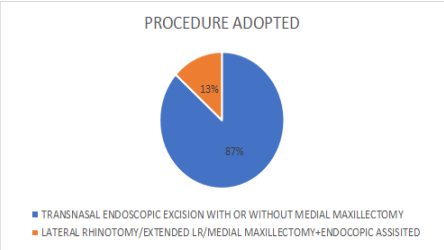
	Krouse Staging System
T1	Tumor confined to the nasal cavity, no extension into the paranasal sinuses. No concurrent malignancy.
T2	Tumor involves the osteomeatal complex, ethmoid sinus, and/or medial maxillary sinus. May or may not involve the nasal cavity. No concurrent malignancy.
T3	Tumor involves another wall of the maxillary sinus (lateral, inferior, superior, anterior, or posterior), sphenoid sinus, and/or frontal sinus. No concurrent malignancy.
T4	Tumors with extranasal/extrasinus involvement (e.g. orbit, intracranial, or pterygomaxillary space). All tumors with associated malignancy.

4.**AREA OF INVOLVEMENT**

AREA	NO.OF PATIENTS	PERECENTAGE
Middle meatus	**15**	**100**
Maxillary sinus	**15**	**100**
ethmoids	**7**	**46.6%**
Sphenoethmoidal area	**8**	**53.3%**
Frontal recess/sinus	**5**	**33.3%**
Inferior turbinate	**4**	**26.6%**
Inferior meatus	**4**	**26.6%**
Septum	**7**	**46.6%**
Cranial fossa	**0**	**0**
Orbit	**1**	**6.6%**
Pterygopalatine fossa	**0**	**0**

5.PROCEDURE ADOPTED

PROCEDURE	NO.OF PATIENTS	PERCENTAGE
Transnasal endoscopic excision with or without medial maxillectomy	**13**	**86.6%**
Lateral rhinotomy /extended LR/ medial maxillectomy +endoscopic assisted	**2**	**13.3%**
Palliative radiotherapy	**0**	**0**



TREATMENT: Treatment is surgical, with the main aims of relieving symptoms and enabling pathologic examination of a complete specimen, notably to check for the malignancy.

Adjuvant Therapy: The most common form of adjuvant therapy is external beam radiation therapy (XRT), which is typically reserved for SCC ex-IP following complete resection. Additionally, XRT should be considered for inoperable tumors (poor patient candidate, involvement of neurovascular structures). Patients should be counselled that for SCC ex-IP, complete surgical resection followed by XRT has a superior 5-year survival (84%) compared to 41% for XRT alone. There has also been limited evidence of response to carboplatin/paclitaxel for inoperable IP with CIS that significantly debulked the tumor and allowed for surgical resection. Finally, topical 5-fluorouracial has had positive preliminary results in recurrent challenging cases, although further investigation is needed. [1][2]

Summary: Inverted papillomas are benign sinonasal tumors that can recur or become cancerous. The mainstay of treatment is surgical resection. We summarize the biology of inverted papillomas and review surgical outcomes in an effort to define the current treatment strategy.

As mentioned, the surgical approach to IP has changed dramatically, with early resections relying on open lateral rhinotomy and Weber–Ferguson incisions for access. With improvement and experience with endoscopic techniques, the vast majority of IPs can be managed endoscopically. The most common site of origin for inverted papillomas is the lateral nasal wall, and the primary limitation to the endoscopic approach is the lateral extent of the tumor. Accordingly, endoscopic medial maxillectomies and modified endoscopic Denker's procedures to access the far lateral maxillary sinus have been described. A sublabial (Caldwell–Luc) approach also offers excellent lateral view. Intuitively, complete surgical excision of IP lesions is essential to long-term disease control and prevention of recurrence. Prior to the mid-1990s, open en-bloc surgical resection was the standard-of-care with associated lateral rhinotomy or Caldwell–Luc approaches. As instrumentation and optics have greatly advanced in the years that followed, endoscopic resection has gradually been adopted as the preferred approach.

DISCUSSION: As inverted papilloma. is the most common sinonasal tumor with a potential of malignant transformation, it will likely remain an active area of research for years to come. It offers a unique model to study sinonasal squamous cell carcinoma, which despite moderate advances in surgical techniques and adjuvant therapy, the overall survival rate remains low. Our lack of understanding is highlighted by the fact that, to this day, these tumours can only be confirmed histologically by H&E stain, without a validated set of molecular markers unique to the pathology. Recent genomic studies have shown promise in better classifying these tumors, with several signaling pathways implicated in the pathogenesis of inverted papillomas. The studies and in vitro inhibition experiments that follow should greatly enhance our understanding of their tumor biology and, ultimately, conceive novel treatment options for patients.

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