

**Original Article****Inverted Papilloma: Our Experience of Endoscopic Medial Maxillectomy and its Outcome in a Tertiary Care Center, Nepal**Meenakshi Basnet<sup>\*1</sup>, Sanjeev Kumar Thakur<sup>1</sup>, Bibek Ghimire<sup>1</sup>, Akriti Shrestha<sup>1</sup>, Niraj Nepal<sup>2</sup><sup>1</sup> Department of Otolaryngology and Head Neck Surgery, <sup>2</sup> Department of Pathology, Nobel Medical College Teaching Hospital, Biratnagar, NepalArticle Received: 14<sup>th</sup> July, 2020; Accepted: 20<sup>th</sup> November, 2020; Published: 31<sup>st</sup> December, 2020DOI: <http://dx.doi.org/10.3126/jonmc.v9i2.33490>**Abstract****Background**

Inverted Papilloma arises from the lateral wall of nose and is common in maxillary sinus. It is locally invasive, can recur and has malignant potential. Endoscopic medial maxillectomy is the preferred choice.

**Materials and Methods**

This prospective study was conducted in the department of Otolaryngology, Nobel Medical College and Teaching Hospital, Biratnagar from June 2015 to June 2018. A total of 26 patients were included in the study, after informed consent and ethical clearance. Staging was done by Krouse method after imaging studies and preoperative endoscopic biopsy was performed. These patients then underwent endoscopic medial maxillectomy. All the data were collected in excel spreadsheet and analyzed in SPSS software.


**Results**

Out of 26 patients, male: female ratio was 1.6:1, with 16 male and 10 female. Average age was 40.5 years (25-72 years). According to Krouse staging, 2 patients were in Stage I, 7 patients in Stage II and 17 patients in Stage III. Inverted papilloma mostly involved the lateral wall of nose. Unilateral nasal obstruction was the commonest presenting symptom. The commonest post-operative complication was nasal crusting. Most of the patients were treated with simple endoscopic medial maxillectomy.

**Conclusion**

Inverted Papilloma is common in male in their 4<sup>th</sup> decade of life with lateral wall of the nose being mostly affected. Most patients were in stage III of Krouse's staging system. Simple endoscopic medial maxillectomy was the commonest procedure.

**Keywords:** Endoscope, Inverted Papilloma, Malignancy, Nepal

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## Introduction

Inverted papilloma (IP) is a benign; slow growing locally invasive epithelial tumour. The mass invaginates towards the basement membrane but does not breach it, hence the term “inverted” in this type of papilloma. The incidence of IP is 0.5% to 7% of all primary nasal tumors. It is known for local invasion into adjacent paranasal sinuses or other nearby structures, such as the orbit or central nervous system, tendency to recur and 5% to 15% is associated with malignancy [1]. It mostly affects men in 5<sup>th</sup> decade of life with male to female ratio of 4:1 [2-4]. The majority of IPs develop within the maxillary sinus, often originating from the medial wall [5-7]. Isolated involvement of the sphenoid sinus has also been reported by some authors [8, 9].

The treatment of choice for a patient with an IP is surgery. The tumour requires 'en bloc' removal with generous margins of resection of healthy tissue as it reoccurs and also has malignant potential. The classical approach has been external approach leaving an ugly scar, morbidity and sometimes even mortality to the patient. The advent of angled endoscopes and powered instruments has revolutionized the management of sinonasal disorders especially IP. Endoscopic treatment for IP was first described in 1992 by Waitz and Wigand, and by Kamel simultaneously [10, 11]. Now Endoscopic medial maxillectomy (EMM) for many authors is a new gold-standard treatment [12] but individually adapted surgical strategy is recommended.

EMM may be divided into “simple” EMM and “extended” EMM. Simple EMM entails the resection of the medial maxillary wall into its posterior two-thirds. The extended EMM exposes the anterolateral wall of maxillary sinus by resection of lacrimal apparatus, inferior turbinate and the entire medial maxillary wall or by prelacrima approach [13, 14]. Various approaches have been tried by various authors for different stages of the IP. Stage I with simple endoscopic sinus surgery. Stage II with simple EMM or adjuvant procedures like Caldwell-Luc. Stage III with extended EMM [15]. So this study was undertaken to see the effectiveness of various procedures.

## Materials and Methods

This prospective study was conducted in the department of ENT, Nobel Medical College and Teaching Hospital, Biratnagar from June 2015 to June 2018. The Ethical Clearance was taken from the Ethical Review Board of this institute. The study considered 95% confidence interval and 80% power to estimate the sample size.

According to the literature review of nasal mass 80% [15], Using one sample size formula, the sample size became 25. Census method was used as sampling technique. Initially 29 patients were included in this study after obtaining informed consent. Three patients were excluded as one had orbital extension and 2 cases were Squamous cell carcinoma on histopathology. So, only 26 patients were included in the study. Inclusion criteria were all patients who were pre-operative biopsy proven IP only and having a follow up of 2 years. The exclusion criteria were nasal masses other than IP, and patients not giving consent or not willing for surgery. All the patients were assessed with imaging studies (both CT and MRI scans). The Krouse staging system [13] was used for the planning of the surgery. All these biopsy proven patients underwent endoscopic medial maxillectomy under general anesthesia via HD video endoscopy with 0°, 45° and 70° Hopkins endoscopes (KARL STORZ, Tuttlingen, Germany) and a microdebrider system (Medtronic, Meerbusch, Germany). According to the extent of the disease, the type of surgery was planned. Stage I and II were managed by simple endoscopic medial maxillectomy (SEMM). Stage III disease was managed by SEMM in most of the cases. However, those cases where the disease was attached to anterior-inferior and anterolateral wall of the maxillary sinus were managed by extended endoscopic medial maxillectomy (EEMM). In EEMM, a part of anterolateral wall was excised by osteotomy, along with the medial wall, after incision on the lateral wall of vestibule and elevating the flap, which improved the access to the origin of the pathology. Endoscopic sphenoidotomy was done in cases involving the nose and sphenoid sinus. None of the cases had nasal packing post-operatively. The extent of disease, the sinuses involved, site of attachment, type of surgery done and complications were noted. These patients were followed up to a minimum of 2 years. The data were tabulated in Microsoft excel sheet 2010 and analyzed by statistical package for social science (SPSS 21 version).

### The Krouse's staging system for IP

STAGE	CRITERIA
I	Located to one area of nose without extension into PNS
II	Involves medial wall of maxillary sinus, ethmoid +/- OMC
III	Involves posterior, anterior, floor, superior, lateral wall of maxillary sinus, sphenoid, frontal sinus
IV	Extra-sinonasal, intra-cranial extension, malignant transformation

PNS – Paranasal sinus; OMC – Osteomeatal Complex



## Results

Amongst the 26 patients enrolled in the study, there were 16 male and 10 female with male to female ratio of 1.6:1. The age ranged from 25 years to 72 years with the average age being 40.5 years. The lateral wall of nose was the most common site of involvement by disease as shown in Table 1. According to Krouse staging, Stage I contained 2 patients, 7 patients in Stage II and 17 patients in Stage III seen in table 2. The presenting signs and symptoms (Table 3) with decreasing frequencies were unilateral nasal obstruction 21 (80.76%), nasal discharge 20 (76.92%), nasal bleeding 15 (57.69%), hyposmia/ anosmia 10 (38.46%) and pain 2 (7.69%) respectively. In 17 patients the implantation site of inverted papilloma was in the floor of maxillary sinus. 2 patients had 2 attachment sites, in the floor as well as in posterior wall of maxillary sinus whereas in 2 patients there was 3 attachment sites within the maxillary sinus i.e. in the floor, posterior wall and anterior wall. Type of surgery depends on Krouse's staging shown in Table 4 in 2 (7.69%) patients with stage I disease, 7 (26.92%) patients with stage II disease and 8 (30.76%) patients with stage III disease simple/standard EMM was done. Extended EMM was done in 6 (23.07%) patients and sphenoidotomy was done in 3 (11.53%) patients with stage III disease. Post-operative complications were seen in 19 patients. Nasal crusting being the most common complication 9 (34.61%) followed by epistaxis 5 (19.23%), epiphora 3 (11.53%) and lid oedema 2 (7.69%) seen in Table 5. The epiphora resolved on its own. Post-operative bleeding was managed conservatively. Recurrence rate was 7.69% (2 out of 26) who underwent revision EMM. The average blood loss in was 412.77 ml. The duration of hospital stay was 3 days average.

**Table 1: Site involved by tumor**

Site involved	Number of cases	Percentage (%)
Lateral wall of nose	26	100
Maxillary Sinus	21	80.76
Ethmoid sinus	9	34.61
Sphenoid sinus	3	11.53

**Table 2: Tumour stage involved as Krouse staging**

Stage	Number of cases	Percentage (%)
Stage I	2	7.70
Stage II	7	26.92
Stage III	17	65.38

**Table 3: Presenting signs and symptoms**

Sign and symptoms	Number of Cases	Percentage (%)
Unilateral nasal obstruction	21	80.76
Nasal discharge	20	76.92
Nasal bleed	15	57.69
Hyposmia/anosmia	10	38.46
Pain	2	7.69

**Table 4: Type of surgery done according to the Krouse's staging**

Disease stage	Simple/standard EMM	Extended EMM	sphenoidotomy
Stage I	2 (7.69%)	0	0
Stage II	7 (26.92%)	0	0
Stage III	8 (30.76%)	0	0
Stage III	0	6 (23.07%)	0
Stage III	0	0	3 (11.53%)

**Table 5: Complications**

Complications	Number of Cases	Percentage (%)
Nasal crusting	9	34.61
Epiphora	3	11.53
Lid oedema	2	7.69
Epistaxis	5	19.23
Reoccurrence of tumour	2	7.69

## Discussion

Inverted Papilloma (IP) is a pathology that frequently involves the sinonasal cavities. Grossly they present as a unilateral, thick, polypoidal, fleshy reddish mass in the nasal cavity. From the site of origin, it may have a single site attachment or it may be multifocal which may be seen as calcification in radiology. However, the attachment can be confirmed only during surgery. Microscopic examination shows that the epithelium invaginations characteristically into underlying connective tissue stroma with an intact basement membrane. IP has a propensity for men, having male: female ratio of 4:1 [2-4]. Though our study has a male dominance of 61.53% men and 38.47% women; the ratio is only 1.6:1. This finding was similar to a study done by Chettri et.al [19]. This could be due to the reason that Nepal has a male to female ratio of 49:51, so the high ratio of female. The average age of presentation was 40.5 years showing a preponderance of older age group, other literature studies showed a little higher age presentation between the range of 50 to 60 years [16, 17], this differs from our study due to the symptoms presentation in our study is similar to studies done by Weissler et.al [18], Chettri et.al [19] and Lyngdoh et. al. [17]. A lot of staging system has been used for IP but the commonest ones are Krouse [20] and Cannady [21], based on Krouse's classification, we observed most cases in stage III and the least in stage I which was





similar to the finding by Jurado-Ramos A et. al [22]. Literature shows bilateral and multicentric IP to be 9% and 12%, respectively [20, 23]. In our study all cases were found to be unilateral but multicentric in few cases. Savy et al. examined a large group of patients using CT and MRI, reporting areas of focal hyperostosis, high density or calcification that corresponded to the location of the primary tumour [20]. These radiological signs help the otolaryngologist to clarify the clinical symptomatology a helps in surgical planning. The most common site of involvement was found to be on the lateral wall of the nose in all patients in our study. This was found similar to various other studies [24, 25]. As there was no external wound, average hospital stay was 3 days. Sautter et al in their study observed similar results [26].

Simple/standard EMM was performed in 17 (65.38%) patients which was quite high compared to In study by Pagella et. al [13] simple/standard EMM was performed in 17 cases (20.2%) and extended EMM in 38 (45.2%) cases compared to our study where simple/ standard EMM was performed in 17 (65.38%) n patients and extended EMM in 6 (23.07%). Nasal crusting was most common complication seen in 9 (34.61%) patients which was similar to study by Ghosh A et.al. [15] and Chettri et. al. [19]. Our follow-up period covered 2 year after surgery. In a meta-analysis, Busquets et al. found that 6.6% of cases developed malignancies, whereas no malignant degeneration was evident in any of the patients in our study [17, 27], this could be due to less follow-up period. The recurrence rate was 12% in a meta-analysis study by Busquets et.al [17, 27] which was quite similar to the present study showing 7.69% recurrence within a period of 2 year of follow-up. Post-operative nasal bleed occurred in 11.53% (3 out of 26) which was managed conservatively.

### Conclusion

Inverted Papilloma is more common in male in the 4<sup>th</sup> decade of life Nasal obstruction, nasal discharge and epistaxis are the commonest symptoms and signs. Lateral wall of the nose is the most affected site by the disease. Most of the patients present in stage III of Krouse's staging system. Various approaches for the management of IP can be decided depending on the extent of the disease and the structures involved by the tumour. Nasal crusting was the common complication post-operative. Tumour reoccurrence was found over 2 years follow up.

### Limitation of study

This is an institutional based study with less number of cases and the follow up period was also only 2 years.

### Recommendation

A larger case series study with longer follow up period is recommended to study the various aspects of this pathology.

### Acknowledgement: None

### Conflicts of interests

There are no conflicts of interest in this study

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