Inverted papilloma from the Maxillary sinus: Recurrence after more than 5 years of follow-up

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ABSTRACT

Outcome objectives: To compare the long-term prognosis of endoscopic sinus surgery (ESS) combined with Caldwell-Luc approach (CLA), and a kind of a newer technique such as prelacrimal recess approach (PLA) for maxillary sinus (MS) inverted papilloma (IP)

Methods: A retrospective cross-sectional study was conducted in patients who were diagnosed as maxillary sinus MS IPs from 2003 to 2023. Age at diagnosis, sex, hyperostosis on the computed tomography, operation records, the recurrence and the malignant transformation were evaluated. Excluding 2 cases of total maxillectomy, subgroup analysis on recurrence rate was performed according to surgical techniques.

Results: Among 59 cases (44 male, mean 58.9 years), 11.9% were revision cases. Hyperostosis was found in 49.2%, most frequently in superior wall (SW) followed by anterior (AW) and posterior walls. AW (44.1%) was found to be the most prevalent origin followed by superior (35.6%), and medial wall (MW, 33.9%). More than half (52.5%) originated from more than two walls of the MS. The overall recurrence rate was 16.9% after a mean follow-up period of 60.0 months. Malignant transformation was found in 13.6% (6 synchronous and 2 metachronous). The recurrence rate was 29.2% after ESS (n=24), 12.8% after CLA (n=19), 0% after EMMM (n=14). EMMM showed less recurrence compared to adjuvant CLA with ESS (p=0.033). Time until the recurrence was 47.5 months after ESS and 105.0 months after CLA (p=0.033). Especially there were 3 cases of AW recurrence after CLA after 5 years of the first operation.

Conclusions: AW of MS might be a blind spot or contaminated portion for CLA. Long-term follow-up more than 10 years might be needed after CLA.

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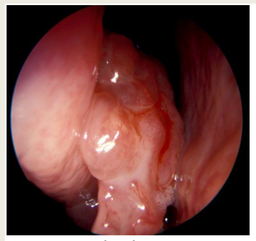
INTRODUCTION



Inverted papilloma (IP) is a sinonasal benign tumor with a high local invasiveness, the potential to progress to cancer, and a very high recurrence rate. Surgical techniques have applied to approach the origin site of the maxillary sinus (MS) IP besides endoscopic sinus surgery (ESS): the classic adjuvant Caldwell-Luc approach (CLA) or canine fossa approach to gain improved access and allow for better debridement or the endoscopic modified medial maxillectomy (EMMM) technique such as prelacrimal recess approach (PLA) or inferior turbinate swing approach, which provides direct view of the all walls.
In this study, we aimed to analyze the long-term prognosis of various surgical approaches of MS IPs.

SUBJECTS AND METHODS

A retrospective cross-sectional study was conducted in patients who were diagnosed as MS IPs from 2003 to 2023. The data were extracted from the electronic medical records system in the hospital.
Age at diagnosis, sex, smoking, alcohol history, operation records, the recurrence and the malignant transformation were evaluated. Hyperostosis (which can predict the origin of the IP preoperatively on the computed tomography), tumor origin and the techniques were evaluated by 2 rhinologists with more than 10 years of experience.
Excluding 2 cases of total maxillectomy, subgroup analysis on recurrence rate was performed according to surgical techniques.
Statistical analysis was performed by independent samples T-test, chi-square test, and Fisher's exact test using SPSS 18.0. The variables were regarded as significant when the p-value was less than 0.05.

RESULTS

Among 59 cases, there were 44 males, and the mean age at diagnosis was 58.9 years (age range, 32-87). There were 11.9% of revision cases. Smoking history including present and previous smokers and the drinking history was found in 40.7%.
IP site was single wall origin in 47.5%. Surgical approach was chosen according to origin site. There were 58.3% of single wall originated lesion in ESS group, 47.4% in ESS + CLA group, and 35.7% in EMMM group. Others originated from more than two walls of the MS (multiple origin).
Anterior wall (AW) (44.1%) was found to be the most prevalent origin wall followed by superior (35.6%), and medial wall (MW, 33.9%) (Table 1).
Hyperostosis on the preoperative CT was found in 49.2%, most frequently in superior wall (SW) followed by anterior and posterior walls. And 92.9% of the hyperostosis was found to be origin of the IP by pathologic findings (Figure 1).

Table 1. Patient Characteristics.

	ESS (n=24)	ESS + CLA (n=19)	EMMM (n=14)	*p-value*
Age, year	57.9 (32-87)	57.6 (±12.3)	58.1 (±14.0)	
Sex (male)	15 (62.5%)	15 (78.9%)	12 (85.7%)	
Smoking (PYRs)	11 (45.8%)	5 (26.3%)	6 (42.9%)	
alcohol	10 (41.7%)	7 (36.8%)	5 (35.7%)	
hyperostosis	8 (33.3%)	11 (57.9%)	9 (64.3%)	
revision cases	3 (12.5%)	2 (10.5%)	2 (14.3%)	
Single lesion (one wall)	14 (58.3%)	9 (47.4%)	5 (35.7%)	
Follow-up (m)	36.2 (±37.2)	69.4 (±50.1)	21.6 (±18.6)	
Recurrence	7 (29.2%)	3 (12.8%)	0 (0.0%)	0.034
Time until recur	35.5 (±41.6)	93.0 (±44.6)	NA	0.033
Malignancy	2 (8.3%)	1 (5.3%)	3 (21.4%)	

The overall recurrence rate was 16.9% after a mean follow-up period of 60.0 months. Malignant transformation was found in 13.6% (6 synchronous and 2 metachronous). Squamous cell carcinoma was associated with IP in 7 patient and sinonasal undifferentiated carcinoma in 1 patient.
According to subgroup analysis, the recurrence rate was 29.2% after ESS (n=24), 12.8% after adjuvant CLA to ESS (n=19), 0% after EMMM (n=14). EMMM showed less recurrence compared to adjuvant CLA to ESS (p=0.033). Time until the recurrence was 47.5 months after ESS and 105.0 months after CLA (p=0.034). It was unable to compare the recurrence time with CLA to EMMM as there was no recurrence in the EMMM cases.

Figure 1. Focal hyperostosis found in the maxillary sinus inverted papilloma on the CT imaging. A, coronal CT image shows focal hyperostosis in the left superior wall of the maxillary sinus. B and C, axial CT images show diffuse hyperostotic lesion in the left anterior and the right posterior wall.

There were 3 cases of AW recurrence after adjuvant CLA after 5 years of the first operation. Representative cases are presented.

Case 1
A 63-year-old male with 40 pack years of smoking history, but without any other medical history was diagnosed as Krouse staging III, SW originated IP in 2010 and had undergone CLA with the techniques of drilling of the origin site. After 144 months, the IP recurred at the AW and PLA was applied and followed up without recurrence until now.

Case 2
A 42-year-old male with 25 pack years of smoking history, but without any other medical history was diagnosed as Krouse staging III, SW originated IP in 2010 and had undergone CLA with the techniques of drilling of the origin site. He had a recurrence at 61 months and the origin sites were SW and AW. He had undergone adjuvant CLA again but IP recurred again at 72 months at AW and then he had undergone PLA and followed up without recurrence until now.

DISCUSSION

It is still inconclusive whether EMMM techniques are superior to ESS with the CLA technique in terms of recurrence rates, due to the shorter follow-up period for PLA compared to CLA.
Interesting finding of this study was that the IP recurrence was found after 5 years of the adjuvant CLA to ESS. The representative case suggests that there might be a IP contamination via canine fossa approach site while putting and pulling out a microdebrider through the site of AW might caused recurrence. Other possibility is that the microscopic AW IP might become a blind spot when making a canine fossa approach so that there could be a gap in between the recurrence from the first operation.
In either case, it is recommend that a long-term follow up more than 5 years, or even 10 years might be needed after adjuvant CLA in IP cases.

CONCLUSIONS

Long-term follow up revealed that the AW of the MS could become a potential blind spot or a contaminated spot in the CLA. More than 5 years of follow-up may be advised in the patient after adjuvant CLA in MS IPs.

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