

# Endoscopic Surgery for Sinonasal Cancer: Uludağ Experience

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## Abstract

**Objective:** The aim of this study is to evaluate the diagnosis and treatment results of patients who underwent endoscopic surgery in our clinic due to malignant paranasal sinus tumors.

**Material and Methods:** Between January 2009 and December 2018, the files of patients with malignant paranasal sinus tumors, who were treated with endoscopic surgery only, without combining it with open surgery, were evaluated retrospectively. Demographic data, histopathological diagnosis, surgical characteristics, postoperative complications, and treatment results were determined.

**Results:** A total of 15 patients, consisting of 7 males and 8 females, aged 17–84 years (average of 50.13) were included in the study. The most common symptom was nasal obstruction, followed by epistaxis. Histopathologic diagnosis was adenocarcinoma in 4 patients; olfactory neuroblastoma in 3 patients; hemangiopericytoma in 2 patients; and squamous cell carcinoma, malignant melanoma, adenoid cystic carcinoma, sinonasal differentiating carcinoma, and small cell carcinoma in the remaining patients. The diagnosis of malignant mesenchymal tumor and extramedullary plasmacytoma was determined as two separate histopathologic diagnoses in 1 patient. The average follow-up period was determined as 33.3 months. Ten patients received postoperative adjuvant therapy, and 4 patients developed local recurrence.

**Conclusion:** In patients with malignant paranasal sinus tumors, if negative surgical margins could be achieved with endoscopic surgery, endoscopic techniques have become more preferred today due to low morbidity rates. Successful oncologic results can be obtained with adjuvant therapies, even if there is a positive surgical margin with endoscopic surgeries.

**Keywords:** Endoscopic, surgery, sinonasal, cancer

## INTRODUCTION

Malignant paranasal sinus tumors are rare carcinomas accounting for approximately 5% of all head and neck carcinomas (1, 2). Unilateral nasal obstruction, loss of sense of smell, nasal bleeding, and nasal discharge are the most common symptoms of this disease group, which consists of many histopathologically different types of tumors (3, 4). Endoscopic surgery was first used in the treatment of nasal inflammatory diseases (5, 6). With the number of patients undergoing basic endoscopic sinus surgery, the experience gained over time has increased. Nowadays, advanced endoscopic endonasal surgeries can be performed with low complication rates due to improvements in the surgical instruments and imaging systems in the last decade (6, 7). Endoscopically, important anatomical sites such as the orbita, skull base, and retrosphenoid area can be reached, and advanced pathologies can be intervened in these areas (8-10).

As a result of these developments, endoscopic techniques have also been used in the treatment of malignant paranasal sinus tumors, the main treatment of which is open surgery. Facial scarring and deformity develop less rarely in endoscopic surgical techniques compared to open surgery techniques, and the duration of hospitalization and treatment costs are lower (9, 11). Although it has many advantages, the biggest drawback in the treatment of malignant paranasal sinus tumors with endoscopic techniques is that tumor resection cannot be performed in most high-volume tumors, especially in the block. It is debatable to what extent this situation affects the survival or disease recurrence.

Since malignant paranasal sinus tumors are rare, studies with a high number of patients are limited. Some of the uncertainties can be solved via sharing of the experience of the centers that can implement these techniques and their current results in the literature. In this study, we aimed to present the preoperative, perioperative, and postoperative characteristics of patients with malignant paranasal sinus tumors treated with endoscopic nasal surgery without combined surgery in our clinic.

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## MATERIAL AND METHODS

The study was started after obtaining the ethical committee's approval (numbered 2018-18 /7 and dated 10/31/2018). The files of patients who underwent endoscopic surgery for malignant paranasal sinus tumors without open surgery between January 2009 and December 2018 were reviewed. Patients who had a combined approach and lack of file data, those who did not complete the 1-year follow-up period, and patients whose end result was reported as malignant despite endoscopic sinus surgery for nonmalignant reasons were excluded. Demographic data, symptoms, physical examination findings, histopathological diagnosis, surgical properties and resection areas, postoperative complications, and follow-up characteristics were determined.

## RESULTS

A total of 15 patients (8 females, 7 males) aged 17–84 years (average of 50.13) who met the inclusion criteria were identified. When the initial symptoms of the patients were examined, nasal congestion and nose bleeding were detected in 6 patients, nasal congestion in 5 patients, nasal bleeding in 2 patients, nasal discharge in 1 patient, and double vision in 1 patient. The average follow-up period was 33.3 months, ranging between 12 months and 72 months.

In 12 patients, no malignancy was detected in frozen sections of the surgical margins sent perioperatively. In 1 patient, surgical margin information could not be reached, or perop surgical margin was not studied. Surgical margins were positive in the other 2 patients. One of these patients was diagnosed with olfactory neuroblastoma, and when periorbital surgical margin was detected as positive, the patient was reoperated endoscopically for additional resection. Periorbital surgical margins were again positive. In the other patient diagnosed with adenoid cystic carcinoma, the surgical margin of the skull base was detected as positive. No additional resection was planned due to anatomic localizations, and adjuvant chemoradiotherapy was applied to both patients. In 2 of our patients, due to the development of effusion in both ears after radiotherapy, bilateral ventilation tube was applied to the patients under local anesthesia. One patient underwent sphenopalatine artery cauterization under general anesthesia due to severe postoperative epistaxis. Epistaxis was stopped by embolization with angiography due to the lack of control. One patient with olfactory neuroblastoma underwent frontal sinus surgery due to the development of the same-side right-sided frontal sinusitis. In 2 patients, perioperative CSF leakage was detected, and defect was repaired by perop endoscopically. Nasal synechia was detected in 4 of our patients, and there was a need for opening the synechia by surgical intervention only in 1 patient. As a result of the permanent pathology, tumor types were reported as adenocarcinoma in 4 patients; olfactory neuroblastoma in 3 patients; hemangioperistoma in 2 patients; and squamous cell carcinoma, malignant melanoma, adenoid cystic carcinoma, sinonasal undifferentiating carcinoma, and small cell carcinoma in other patients. One of our patients underwent endoscopic mass excision in 2012, and the pathology was malignant mesenchymal tumor. During the follow-up, our patient, who was also examined by hematology and had a history of TTP, underwent mass excision of the right and left nasal cavities, in April and September 2015, respectively. Both postoperative pathologies were consistent with plasmocytoma. The patient received adjuvant chemoradiotherapy with the diagnosis of multiple extramedullary plasmocytoma. One of the patients with small round cell carcinoma had chemoradiotherapy, 7 patients underwent adjuvant radiotherapy due to the pathology subtype, and 2 patients underwent adjuvant chemoradio-

therapy due to surgical margin positivity. One patient with malignant melanoma who was recommended adjuvant radiotherapy did not receive adjuvant treatment on his own will, and the recurrence of the maxillary sinus, frontal sinus, orbit, and skull base were detected. In this case, palliative chemoradiotherapy was recommended after optic decompression application. In addition, recurrence was detected in 3 of our patients. In our patient with plasmocytoma, recurrence was found in the gums and palate, and the patient died due to pulmonary embolism and pneumonia. Cranial metastasis was detected in 2 of our patients with intestinal type adenocarcinoma, and they died due to recurrence. There was no recurrence in patients with surgical margin positivity. Data of all patients are presented in Table 1.

## DISCUSSION

Although open surgery is the classical treatment methodology, in the recent period, combined treatments, and in some selected patient groups only endoscopic surgeries, can be performed (9, 11, 12). In this study, we aimed to present the diagnosis and treatment results of malignant paranasal sinus tumors treated with endoscopic surgery only. Similar to the literature, we found that the first and most common symptom was unilateral nasal obstruction and nasal bleeding. Therefore, we believe that patients with unilateral nasal symptoms should be carefully evaluated for possible malignancy.

When endoscopic nasal surgeries are initially performed, they are almost always preferred only in inflammatory nasal masses. Over time, the experience gained in endoscopic sinus surgery increased, and more advanced techniques are applied today. In the last decades, combined therapies or only endoscopic techniques could be applied in the treatment of malignant paranasal sinus tumors, the traditional treatment of which is open surgery (9, 11).

The major advantage of endoscopic methods in the treatment of malignant paranasal sinus tumors compared to open surgery techniques is that the morbidity caused by facial scars and deformities developed in open surgery is not present in endoscopic techniques (9, 12). Despite this important benefit, endoscopic surgery also has some disadvantages that do not comply with the principles of classical oncologic surgery. In classical oncologic surgery, the most successful block removal and negative surgical margins should be reached for treatment success.

Most of the block resection in high-tumor-volume masses is impossible with endoscopic surgery. During the procedure, debulking or piece-meal resection is performed. This has been shown as ineffective to recurrence or survival, although it does not conform to the above-mentioned classical oncological surgery principles (13, 14). In our series, we performed the piece-meal resection and mass excision in all patients. With these findings, we agree with the literature data that most of the block resection is not absolutely necessary. We even believe that debulking and piece-meal resection increase the visual angle and help to reach negative surgical margins.

We argue that the most important criterion for surgical success is to reach negative surgical margins rather than block resection. Of course, the most important factor with this regard is the investigation of whether the patients can be resected endoscopically in the preoperative period. It may not be possible to reach negative surgical margins in tumors that progress rapidly, are locally in an advanced-stage, and are endoscopically unresectable. In cases where it is impossible to reach negative surgical margins endoscopically, we think that it is appropriate to work in collab-

Table 1. Patient data	
	n (patient number)
Gender	
Female	8
Male	7
Age	
Min.	84 years
Max.	17 years
Ave.	50.13 years
Symptom	
Nasal congestion	12
Epistaxis	8
Rhinorrhea	1
Double vision	1
Hyposomia/Anosomia	1
Histopathological diagnosis	
adenocarcinoma	4
Olfactory neuroblastoma	3
hemangiopericytoma	2
Squamous cell carcinoma	1
Malignant melanoma	1
Adenoid cystic carcinoma	1
Undifferentiated carcinoma	1
Extramedullary plasmacytoma + malignant mesenchymal tumor	1
Small cell carcinoma	1
Complications	
Minor (crusting, dryness, nasal synechia)	4
Loss of smell	1
Postoperative bleeding	1
CSF rhinorrhea	2
Sinusitis	1
Recurrence	
Absent	11
Local recurrence (endonasal)	1
Orbital recurrence	1
Cranial recurrence	2
Lymph node metastasis	0
Distant metastasis	0
Follow-up duration	
Min.	6 months
Max.	72 months
Ave.	33.3 months
Min: minimum; Max: maximum; Ave: average	

oration with the Neurosurgery Department in terms of cranial extension and with the ophthalmology department in terms of orbital extension, and if necessary, open surgery or combined approaches would be more accurate because prognosis in these patients will be poor in the presence of gross residual tumor. In the presence of microscopic residual disease, we think that adjuvant therapies will be beneficial. In our own practice, we preoperatively evaluate all patients in terms of their suitability for endoscopic surgery in the head and neck cancer council. We perform endoscopic surgery in patients in whom we expect to reach negative surgical margins. Again, for these patients, we send tissue samples for frozen examination of the surgical margins before terminating perioperative surgery. In our series, adjuvant chemoradiotherapy was performed in a total of 2 patients who were positive for frozen results. No recurrence was detected in their follow-up.

Although studies comparing oncologic results of endoscopic surgical techniques and open surgery have shown that similar results can be obtained with the two techniques, and that even better survival rates can be achieved with endoscopic techniques, we are somewhat cautious about interpreting and applying of these results (15, 16). The necessity of open surgery in locally advanced-stage and endoscopically unresectable tumors, and the presence of patients with lower T stages in the endoscopic surgery group, actually make a difference between these two groups in terms of other prognostic factors. Regardless of the treatment of locally advanced disease, it is predictable that the prognosis will be poorer.

The complication rates are lower in endoscopic techniques than open surgeries (17). The frequency of complications has been reported to range between 10% and 36%, and mortality between 1% and 4% (8, 13). In our series, there was no mortality due to complications. The most common complication was nasal synechia.

## CONCLUSION

Each patient with malignant paranasal sinus tumor should be evaluated preoperatively by an experienced team in terms of open surgery, combined approach, and only endoscopic surgery alternatives. Endoscopic techniques should be preferred primarily because of the low morbidity rates and the possibility of achieving adequate oncologic results in all patients who can obtain negative surgery. In all patients who undergo endoscopic surgery, frozen examination should be performed from the surgical margins, and additional resection should be performed until a negative margin is obtained in the presence of a positive result.

**Ethics Committee Approval:** Ethics committee approval was received for this study from the Ethics Committee of the Bursa Uludağ University School of Medicine (2018-18/7, 30.10.2018).

**Informed Consent:** Informed consent was not taken from patients due to the retrospective nature of the study.

**Peer-review:** Externally peer-reviewed.

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