Endoscopic Management of Sinonasal Hemangiopericytoma

Belachew Tessema, MD1, Jean Anderson Eloy, MD2,3, Adam J. Folbe, MD4, Amy S. Anstead, MD5, Neena M. Mirani, MD6, Deya N. Joudy, MD7, Jose W. Ruiz, MD7, and Roy R. Casiano, MD7

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Abstract

Objective. Sinonasal hemangiopericytomas (SNHPCs) are rare perivascular tumors with low-grade malignant potential. Traditionally, these tumors have been treated with open approaches such as lateral rhinotomy, Caldwell-Luc, or transfacial approaches. Increased experience with endoscopic management of benign and malignant sinonasal tumors has led to a shift in management of SNHPC. The authors present their experience in the largest series of patients with SNHPC managed endoscopically.

Study Design and Setting. Case series at a tertiary care medical center.

Subjects and Method. A retrospective chart review of all patients undergoing endoscopic management of SNHPC at the University of Miami between 1999 and 2008 was conducted. All endoscopic resections were performed with curative intent.

Results. Twelve patients with the diagnosis of SNHPC were treated endoscopically. Mean age was 62.5 years (range, 51-83 years). There were 6 men and 6 women. The mean follow-up was 41 months (range, 15-91 months). Seven (58.3%) presented with nasal obstruction, whereas 4 (41.6%) had epistaxis as their initial presenting symptom. Preoperative angiography or embolization was not performed in any case. Mean estimated blood loss was 630 mL (range, 100-1500 mL). Six patients underwent endonasal endoscopic anterior skull base resection; 4 had complete endoscopic resection all with negative margins. None underwent postoperative adjuvant treatment. No recurrence or metastatic disease was observed in this patient population.

Conclusion. Endoscopic management of SNHPC is a feasible approach and did not compromise outcomes in this experience. In this series, familiarity with advance endoscopic sinus surgery was necessary to manage these patients. Postoperative adjuvant therapy was not necessary in this cohort.

Keywords
hemangiopericytoma, sinonasal tumors, epistaxis, sinonasal hemangiopericytoma, malignant sinonasal tumors, endoscopic sinus surgery, endoscopic skull base surgery, perivascular tumors, anterior skull base resection

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Sinosal hemangiopericytomas (SNHPCs) are low-grade malignant vascular soft tissue tumors that can arise anywhere in the body. They make up approximately 2% to 3% of soft tissue sarcomas. Of that, an estimated 5% arise in the nasal cavity and paranasal sinuses. Males and females are equally affected and are usually seen in the third and fifth decades of life. In patients diagnosed with SNHPC, the most common presenting sign and symptom are epistaxis and nasal obstruction.1,2

As first described by Stout and Murray3 in 1942, SNHPCs are vascular tumors that arise from pericytes of Zimmermann. Pathologists describe a classic histologic “staghorn” pattern on low-power microscopic field. These patterns are vascular channels that are seen in almost all specimens.1,2

1Connecticut Sinus Institute, University of Connecticut, Farmington, Connecticut, USA
2Department of Otolaryngology–Head & Neck Surgery, University of Medicine and Dentistry of New Jersey–New Jersey Medical School, Newark, New Jersey, USA
3Center for Skull Base and Pituitary Surgery, Neurological Institute of New Jersey, University of Medicine and Dentistry of New Jersey–New Jersey Medical School, Newark, New Jersey, USA
4Department of Otolaryngology–Head and Neck Surgery, Wayne State University, Detroit, Michigan, USA
5Virginia Mason Medical Center, Seattle, Washington, USA
6Department of Pathology, University of Medicine and Dentistry of New Jersey–New Jersey Medical School, Newark, New Jersey, USA
7Department of Otolaryngology–Head & Neck Surgery, University of Miami–Leonard Miller School of Medicine, Miami, Florida, USA

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Corresponding Author:
Jean Anderson Eloy, MD, Department of Otolaryngology–Head and Neck Surgery, UMDNJ–New Jersey Medical School, 90 Bergen St, Suite 8100, Newark, NJ 07103, USA
Email: jean.anderson.eloy@gmail.com
Previously, treatment of SNHPCs relied on wide surgical excision through open craniofacial approaches. However, in the past decade, with the advent of endoscopic equipment and the evolution of specialized endoscopic skull base surgeons, a progression toward less invasive approaches has emerged.4-8 Several studies have shown that a solely endoscopic approach is feasible. This report is the largest series of a single institution’s experience with endonasal endoscopic management of SNHPC.

Materials and Methods
A retrospective chart review was performed on all patients with the histological diagnosis of SNHPC who were resected endoscopically from October 1999 to December 2008 at the University of Miami (Figure 1). Information regarding age, gender, presenting symptom, preoperative management, intraoperative complications, type of endoscopic surgery, intraoperative blood loss, and clinical follow-up was collected. All patients were evaluated with a computed tomography (CT) scan of the head, neck, and chest to rule out distal metastasis prior to curative surgical resection. No patients were found to have distal metastasis in our patient population.

The study population was limited to patients who underwent endoscopic tumor resection with curative intent. Preoperative biopsies were not performed as part of the workup because of the vascular appearance of the tumors. Endoscopic resection was performed after maxillary antrostomy, complete sphenethmoidectomy, frontal sinusotomy, and turbinectomies, or septectomy as necessary to gain complete visualization of the tumors’ periphery. Extended procedures, including modified Lothrop (ML) and extended sphenoidotomy (ES) involving bilateral wide sphenoidotomy with posterior septectomy and intersinus septum resection, were performed for patients who had tumors involving the cribriform plate, sphenethmoid recess, or frontal recess.

Tumor debulking was performed to identify the area where the tumor was pedicled (“epicenter” of the tumor). Wide endoscopic local resection of surrounding tissue was performed and the underlying bone was drilled or removed if involved. Frozen section analysis of soft tissue margins was performed to ensure the margins were clear of residual tumor. For tumors involving the cribriform plate or surrounding anterior skull base, a hemi or complete anterior skull base resection and reconstruction using acellular dermal allograft was performed. This reconstruction technique was described in detail by Germani et al9 in 2007. The protocol for this study was reviewed and approved by the institutional review board of the University of Miami, Miami, Florida.

Results
The study population included 12 patients with the histological diagnosis of SNHPC from the University of Miami.
Endoscopic Tumor Resection Database. There were 6 men and 6 women. The patients’ age ranged from 51 to 83 years with an average of 62.6 years. Seven (58.3%) patients presented with nasal obstruction, whereas 5 (41.7%) patients had epistaxis as their initial presenting symptom. Six (50%) patients had tumors involving the cribiform plate and underwent endonasal endoscopic anterior skull base resection and reconstruction. All patients who underwent endonasal endoscopic anterior skull base resection had large dural defects with high-flow cerebrospinal fluid (CSF) leaks that were repaired with acellular dermal allograft. One (8%) patient needed a modified Lothrop procedure to clear tumor margins in the frontal recess. Three (25%) patients needed extended sphenoid sinusotomy to adequately resect the posterior margin, and the remaining 2 (17%) patients underwent wide endoscopic resection with negative margins. The average blood loss was 630 mL (range, 100-1500 mL) with none of the patients having undergone preoperative embolization. All the patients underwent complete resection of the tumor without the need for transfusion. All tumors were resected with at least a 3-mm margin around the lesion and 5 mm when feasible. The mean operative time was 175.5 minutes (range, 64-285 minutes). There were no minor or major complications such as need for reoperation, postoperative CSF leak, meningitis, blood transfusion, prolonged hospital stay, epistaxis, stroke, or death.

There was no local tumor recurrence or distant metastatic disease with a mean follow-up of 41 months (range, 15-91 months). None of the patients received adjuvant postoperative therapy. All patients were examined frequently in the first 3 postoperative months until the sinonasal cavity had completely healed. Regular postoperative endoscopic surveys were scheduled every 3 months for the first postoperative year, every 6 months for the second year, and annually thereafter.

**Discussion**

Sinonasal hemangiopericytomas can be successfully managed endoscopically. The indolent nature of these malignant tumors lends itself to endoscopic resection and surveillance. Safe and complete resection can be performed by an experienced endoscopic surgeon with minimal morbidity. Adjuvant therapy was not necessary in our group where complete resection was achieved with negative margins. Long-term scheduled endoscopic surveillance is necessary to diagnose and manage recurrence.

**Author Contributions**

Belachew Tessema, conception and design, acquisition of data, analysis and interpretation of data, drafting the article, approval of the version to be published; Jean Anderson Eloy, conception and design, analysis and interpretation of data, revising the article.
critically for important intellectual content, approval of the version to be published; Adam J. Folbe, interpretation of data, revising the article for important intellectual content, approval of the version to be published; Amy S. Anstead, analysis and interpretation of data, revising the article for important intellectual content, approval of the version to be published; Neena M. Mirani, acquisition of data, analysis and interpretation of data, revising the article for important intellectual content, approval of the version to be published; Deya N. Joudy, acquisition of data, revising the article for important intellectual content, approval of the version to be published; Jose W. Ruiz, interpretation of data, revising the article for important intellectual content, approval of the version to be published; Roy R. Casiano, substantial contributions to conception and design, analysis and interpretation of data, revising the article for important intellectual content, approval of the version to be published.

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References
Corrigendum


The sixth author’s name was submitted as Deya N. Joudy. The correct spelling is Deya N. Jourdy.