Endoscopic Coblation of Advanced Juvenile Nasopharyngeal Angiofibroma
Rosser Powitzky MD, Brandon Pierson, Paul Digoy MD, John Houck MD
Department of Otorhinolaryngology, Oklahoma University Health Sciences Center, Oklahoma City, OK

Abstract

Objective: To introduce and outline the advantages of an endoscopic coblation-assisted debulking of advanced juvenile nasopharyngeal angiofibromas (JNA). Study Design: Two case reports. Setting: Tertiary referral center. Subjects and Methods: Two male patients undergoing an endoscopic debulking of the intranasal extent of their advanced JNA tumors were reviewed. Their nasopharyngeal orbitomeatal, intracranial, and intracranial extensions with cavernous sinus invasion (Fisch stage IV and Radowski’s stage III). Embolization of tumor feeding vessels was performed before surgery. The tumors were then partially coblated via an endoscopic approach using a Coblator II System with Evac 70 Plasma Wand in conjunction with an image-guided navigation system. Results: Both patients achieved complete resection of their tumor obstructions with minimal hemorrhage throughout the course of resection and at least two more during embolization at our unit institution. Efforts to remove tumor extensions were limited due to the degree of tumor infiltration of intranasal structures, requiring additional microdebrider for remaining tumor in the infratemporal fossa, middle cranial fossa, and cavernous sinus. One patient required five blood transfusions during the first procedure and maintained a patient dorsal aneurysm on two occasions. Postoperative follow-up February 2012. Conclusion: Although the first patient had limited recurrences, one patient required extensive debulking to achieve complete resection. Considering the benefit of the endoscopic approach, Image-guided endoscopic coblation may be a safe and effective minimally invasive approach to remove intranasal portions of advanced JNA tumors.

Introduction

Juvenile Nasopharyngeal Angiofibroma (JNA) is a rare, locally aggressive tumor primarily affecting males in the second and third decades. It has a classic naso-oral and T-shaped nasopharyngeal tumor with resection of nasopharyngeal tumor can be achieved. Surgery, however, is limited by the degree of blood loss, larger operative time, and increased need for surgical expertise. Various methods of endoscopic resection have been described, particularly in the management of JNA. Minimizing the number of instruments required for each procedure, reducing postoperative recovery, and reduced intraoperative hemorrhage are considerable benefits of the endoscopic approach.3,5,6

Methods and Materials

With Institutional Review Board approval, we reviewed the operative management of two individuals diagnosed with JNA in 2009. The history and clinical courses were documented to describe intraoperative complications and recovery outcomes. Both patients received definitive treatment using a Coblator II System with Evac 70 Plasma Wand and image-guidance navigation following embolization of tumor feeding vessels. After completing a literature search for recent endoscopic resection of JNA, we compared the operative benefits of our proposed technique versus currently used endoscopic methods.

Results

Both patients with advanced stage JNA achieved symptomatic relief of nasal cavity obstruction using a combination of microdebrider and the Coblator II System or the Coblator II System alone. Surrounding healthy tissues showed no discernible injury on follow-up endoscopic exams. A summary of operative management and postoperative recovery is shown in Table 1. Patient 1 required several redo-to.s via a TRU prior to achieving satisfactory resection of the nasal obstruction. Recurrent intraoperative bleeding complicated initial attempts at debulking, obliging further embolization by the IR team. After re-exploiting multiple facial vessels using microdebrider, bipolar, and snare curet, the Coblator II System was successfully implemented for this purpose. Minimal blood loss occurred following immediate embolization. He required a total of four blood transfusions from our unit while undergoing two more during embolization at our unit institution. Efforts to remove tumor extensions were limited due to the degree of tumor infiltration of intranasal structures, requiring additional microdebrider for remaining tumor in the infratemporal fossa, middle cranial fossa, and cavernous sinus. One patient required five blood transfusions during the first procedure and maintained a patent dorsal aneurysm on two occasions. Following surgery (Figures 1 & 2). Case 2 underwent a single debulking procedure using the Coblator II System with image-guided navigation and endoscopic assistance to create a patent nasal airway. Tumor was completely removed from both nasal cavities and nasopharynx for symptomatic relief. He required a single anti-hypertension treatment before his procedure which was more prominent in nature. The postoperative course was equally uneventful following coblation. He received similar adjuvant radiation therapy for residual tumor extensions.

Discussion

Advanced-stage JNAs pose considerable concerns for definitive management. Although multiple methods of therapy have been described, surgical resection remains the preferred primary treatment modality.6 Radiofrequency coblation uses a single plasma wand for both coagulation and tissue ablation. It is minimally invasive and allows for single-handed control of the procedure. The Coblator II System was successfully implemented for this purpose. Minimal blood loss occurred following immediate embolization. He required a total of four blood transfusions from our unit while undergoing two more during embolization at our unit institution. Efforts to remove tumor extensions were limited due to the degree of tumor infiltration of intranasal structures, requiring additional microdebrider for remaining tumor in the infratemporal fossa, middle cranial fossa, and cavernous sinus. One patient required five blood transfusions during the first procedure and maintained a patent dorsal aneurysm on two occasions. Following surgery (Figures 1 & 2). Case 2 underwent a single debulking procedure using the Coblator II System with image-guided navigation and endoscopic assistance to create a patent nasal airway. Tumor was completely removed from both nasal cavities and nasopharynx for symptomatic relief. He required a single anti-hypertension treatment before his procedure which was more prominent in nature. The postoperative course was equally uneventful following coblation. He received similar adjuvant radiation therapy for residual tumor extensions.

Conclusions

Image-guided endoscopic coblation may be a safe and effective method for resection of intranasal portions of advanced JNA tumors. Currently proposed methods are limited by the complex instrumentation for adequate debulking and inserting and removing multiple instruments to identify vessels and control bleeding. Resection of JNA remains a limiting factor in the ability to completely remove the tumor and creates challenges to achieve complete resection. Although the first patient had limited recurrences, one patient required extensive debulking to achieve complete resection. Considering the benefit of the endoscopic approach, Image-guided endoscopic coblation may be a safe and effective minimally invasive approach to remove intranasal portions of advanced JNA tumors.

Bibliography