

Application of Transoral Robotic Surgery (TORS) in the Management of Oropharyngeal Venous Malformations

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Abstract

Objectives: Rapid growth of vascular malformations of the upper airway often necessitates surgical management. Whereas traditional open approaches were associated with significant morbidity, transoral robotic surgery allows for resection of such tumors in the oropharynx in a minimally-invasive manner.

Study Design: Case report.

Methods: We present a case of an adult patient with new obstructive airway symptoms and a vascular mass of the base of tongue consistent with a venous malformation. Management included cooperation of a multidisciplinary team of both Otolaryngology and Interventional Neuroradiology to perform sclerosis and excision of the lesion using TORS.

Results: Sclerosis and transoral robotic resection was completed in a single 90 minute procedure, which did not necessitate a tracheostomy for airway management. The patient resumed an oral diet and was discharged postoperative day one. Upon follow up, he reported resolution of his dyspnea and dysphagia. He remains without evidence of recurrence at 6 months.

Conclusions: In select cases, preoperative sclerosis and transoral robotic surgery can contribute to minimally-invasive treatment of venous malformation of the upper airway.

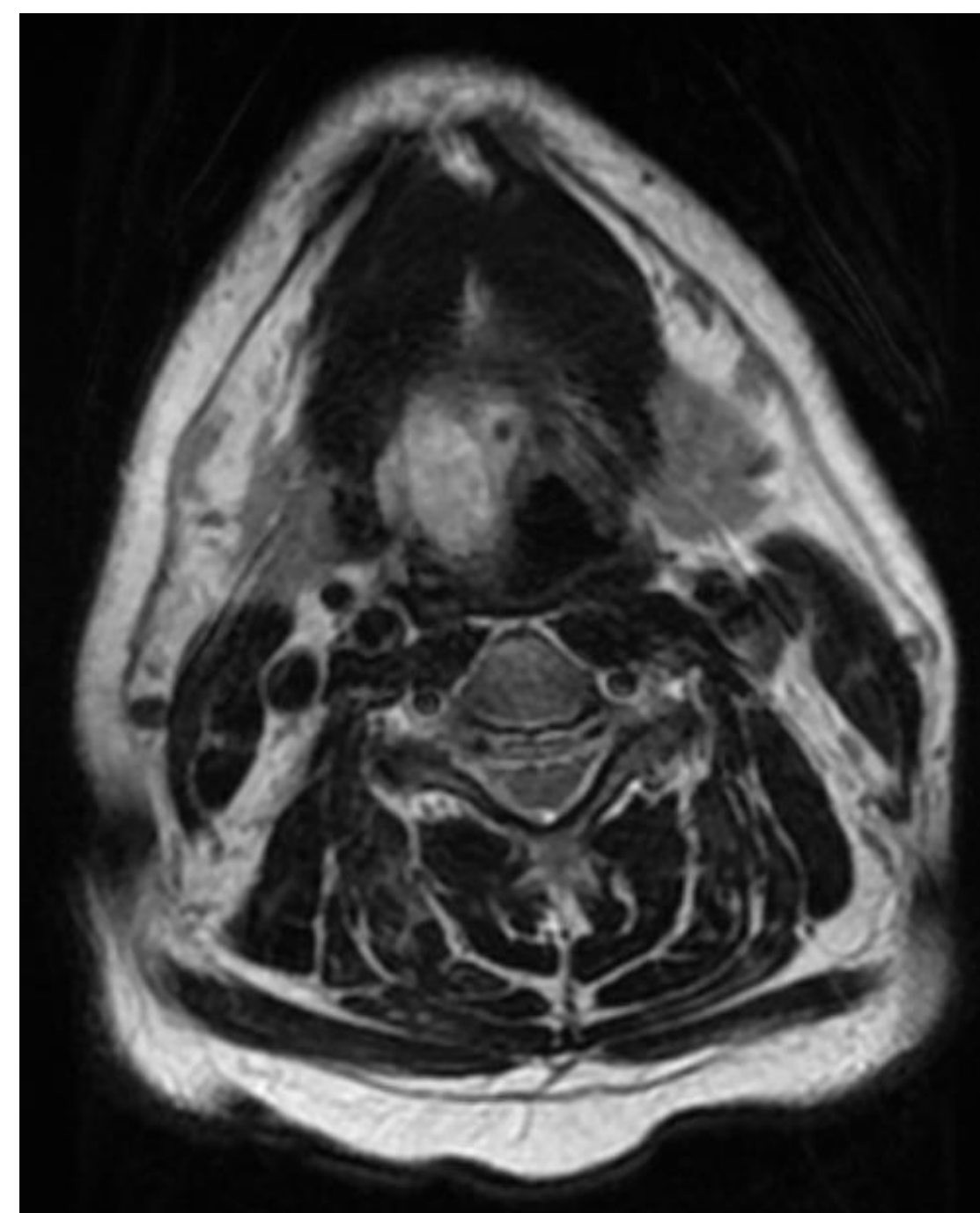
Introduction

Venous malformations are the third most common vascular malformation in the head and neck following hemangiomas and lymphatic malformations. Given their complexity, management of venous malformations is best performed in a multidisciplinary care setting. Treatment of lesions that are cosmetically disfiguring or that cause significant functional impairment involves a combination of laser, surgical resection, and sclerosing agents. Open surgical approaches have been traditionally employed for malformations of the oropharynx. Such procedures often required tracheostomy for postoperative airway management. Here we present a multidisciplinary approach where preoperative sclerosis followed by transoral robotic resection resulted in successful treatment with minimal associated morbidity.

Figure 1. Pre-operative CT.



Figure 2. Pre-operative MRI.



Case Report

A 37 male presented with mild odynophagia, dysphagia, and hypernasal speech since childhood. In the month following a motor vehicle accident he had experienced new hearing loss, progressive stridor, dyspnea on exertion, and worsening nighttime snoring. The patient was referred to an otolaryngologist who noted hyponasal speech. Flexible laryngoscopy revealed a violaceous submucosal mass centered on the right base of tongue that extended to the lingual surface of the epiglottis, and displaced the epiglottis posteriorly resulting in partial obstructed the airway. A CT with contrast of the neck was obtained which revealed phleboliths centered in a non-enhancing mass of the base of tongue (Figure - 1). On T-2 weighted MRI of the neck with gadolinium, the mass was noted to be hyperintense and septated (Figure -2). This was determined to be a venous malformation. Given his young age and his rapidly progressive symptoms, preoperative sclerotherapy and transoral robotic resection was offered.

Case Report Continued

The patient was taken to the operating room. With the exposure of the FK retracator the IR team directly injected the sclerosing agent, sodium tetradeacyl, in combination with a contrast agent iohexol under endoscopic view into the lesion. The robotic arms were then inserted transorally. A transverse cut was made across the right base of tongue at the level of the circumvallate papillae from medial to lateral. The glossotonsillar fold was traversed, and dissection proceeded laterally through the superior constrictor into the parapharyngeal space. Branches of the lingual artery were clipped. A midline mucosal cut was then made from the base of tongue to the bare cartilage on the lingual surface of the epiglottis. To facilitate exposure, the tongue blade of the FK was advanced and the 30-degree scope was inserted. The mass was dissected off of the cartilage of the epiglottis. The dissection proceeded through the pyriform sinus, the pharyngeal constrictors, glossopharynx and styloglossus muscles, and eventually joined the transverse tongue base cuts. Final mucosal cuts were completed medially along lateral pharyngeal wall.



Figure 3. Intraoperative sclerosis

Results

The patient was extubated in the operating room without difficulty. Speech language pathology evaluated him on POD#1 and started a mechanical soft diet. The patient immediately tolerated oral feeding well, the feeding tube was removed, and he was discharged later that day. At 6 months follow up he is tolerating a normal diet without evidence of recurrence.

Discussion

There is no single treatment modality that is appropriate for all lesions. Management of large venous malformations can require interdisciplinary discussion with cooperation of the interventional radiologist, surgeon, and often dermatologist. The different management strategies for venous malformation treatment include laser, surgery, and sclerosis.

-Laser therapy is a suitable options for mucosal lesions of the upper aerodigestive tract, particularly superficial lesions. Though with use of the laser, repeat treatments are often required.

-Sclerotherapy, infused under fluoroscopic visualization, may be deployed as these are slow-flow lesions. This is most effective for deep lesions, as more superficial lesions have a higher risk of ulceration and scar formation. Additionally, these agents may cause variable amounts of swelling immediately following injection leading to possible obstruction if used in the airway.

-Surgical excision is the historical method for removal of low flow vascular malformations. Access to the oropharynx has historically required the morbidity of mandibular osteotomies and large incisions, followed by need for a tracheostomy for post-operative airway management. The introduction of the transoral robotic approach has obviated the need for these methods of exposure.

Conclusions

In select cases, preoperative sclerosis and transoral robotic surgery can contribute to minimally invasive treatment of venous malformation of the upper airway.

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