

Abstract

Objective	To understand the role and technical considerations of free flap reconstruction of posterior nasopharyngeal and clival defects.
Study Design	Case report
Methods	We present a case of a 45-year-old female with granulomatosis with polyangiitis complicated by sinonasopharyngeal destruction and chronic fungal osteomyelitis of the cervical spine with extension to the skull base. Preoperative imaging revealed complete full thickness defects of the nasopharynx extending to the prevertebral soft tissues with erosion of the clivus.
Results	The patient was taken to the operating room for a combined endoscopic and transcervical approach for reconstruction of the nasopharyngeal defect using a myogenous serratus anterior free flap. The pedicle was tunneled through the parapharyngeal space and anastomosis was performed in the neck. Inset of the free flap was accomplished endoscopically with absorbable tacks using a laparoscopic fixation device. Follow up endoscopy revealed a viable flap, which healed into the defect and was completely mucosalized. She remains without recurrence of meningitis.
Conclusion	Where local vascularized flap reconstruction is not available, microvascular free flap reconstruction of posterior nasopharyngeal wall and skull base defects is possible via a combined endoscopic and transcervical approach.

Introduction

Granulomatosis with polyangiitis (formerly known as Wegener Granulomatosis) is a multisystem autoimmune disease with prominent head and neck manifestations. Sinonasal involvement is seen in a majority of affected individuals.¹ Nasopharyngeal involvement is seen in 60-80% of patients and may result in ulceration and destruction of the bone.^{2,3,4,5}

Reconstruction of the nasopharynx and skull base can be accomplished using a variety of techniques, dependent upon the size of the defect. Options include free mucosal grafts from the nasal cavity or oral cavity, vascularized pedicled flaps, e.g. nasoseptal, inferior or middle turbinate flaps⁶, or free tissue transfer.^{7,8}

Case Report

A 45-year-old woman with granulomatosis with polyangiitis presented to us with a 2-year history of chronic cervical spinal osteomyelitis secondary to nasopharyngeal erosion and destruction with extension into the prevertebral soft tissues (Figure 1). She had been treated with multiple antimicrobials during this time for biopsies demonstrating *Klebsiella*, *E. faecalis*, *Candida* *gabrata* and *Rhizopus*. Despite this, she continued to have meningitis secondary to the nasopharyngeal communication with the brainstem. Reconstructive options were limited due to the lack of local tissues secondary to her disease process. A myogenous serratus free flap was therefore used for reconstruction. This was accomplished by an endoscopic and transcervical approach (Figure 2). A tunnel was created from the lateral neck to the nasopharynx for inset of the free tissue with absorbable tacks (Figures 3,4,5) and anastomosis was accomplished using the superior thyroid artery.

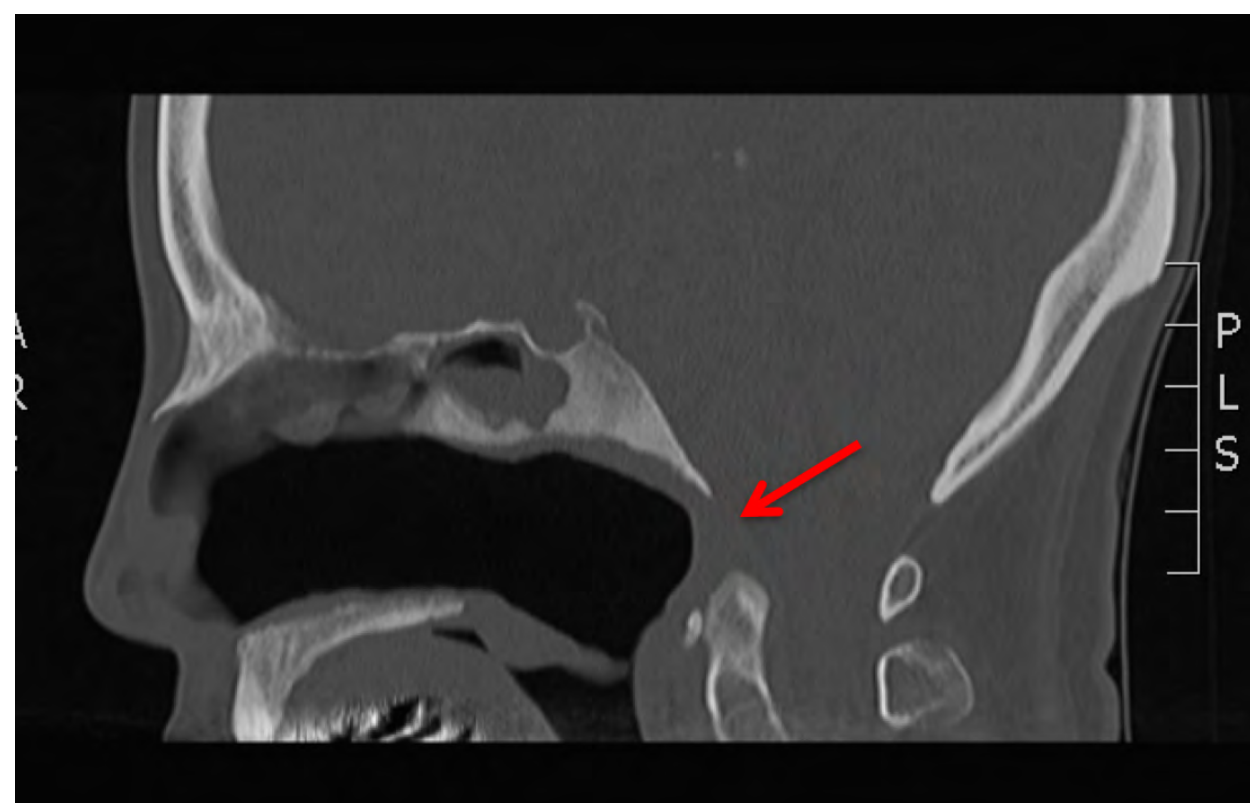


Figure 1. Sagittal CT demonstrates nasopharyngeal defect.

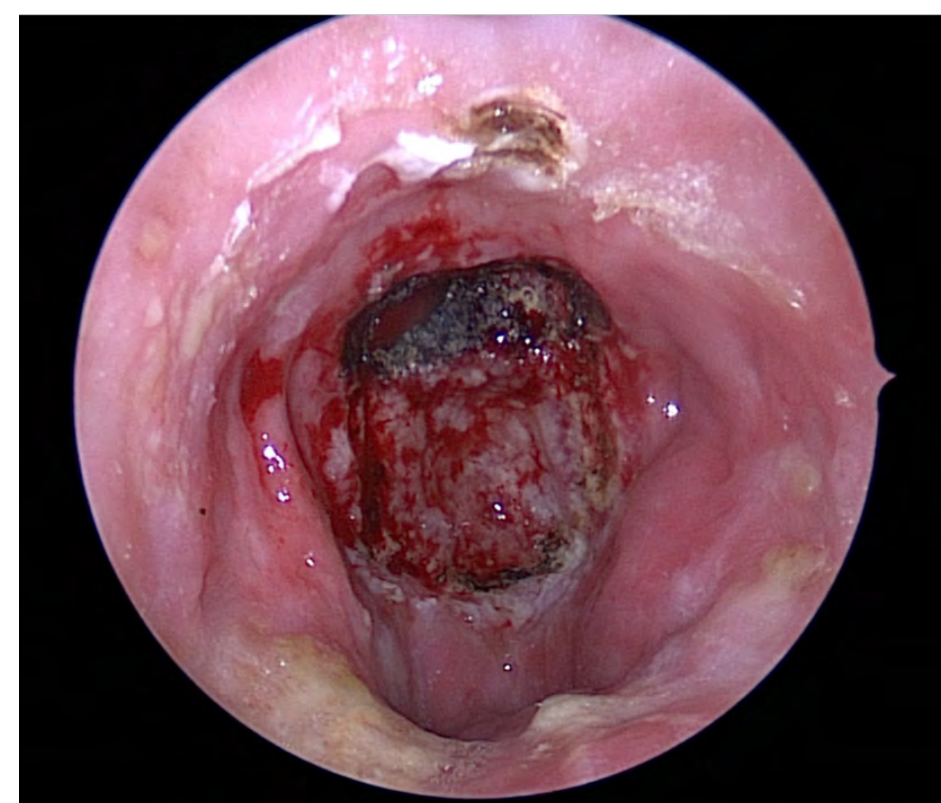


Figure 2. Endoscopic view of the nasopharyngeal defect.



Figure 3. Intraoperative photo demonstrating transcervical approach to the nasopharynx.

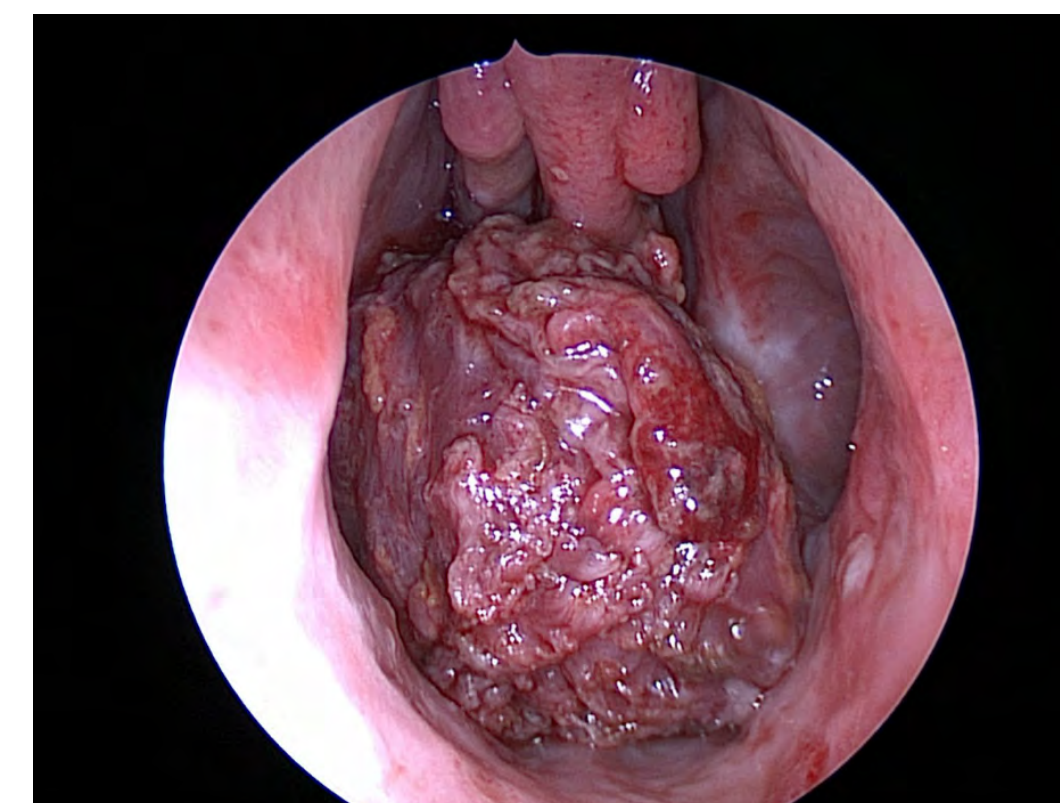


Figure 4. Myogenous serratus free tissue visualized overlying the nasopharyngeal defect.

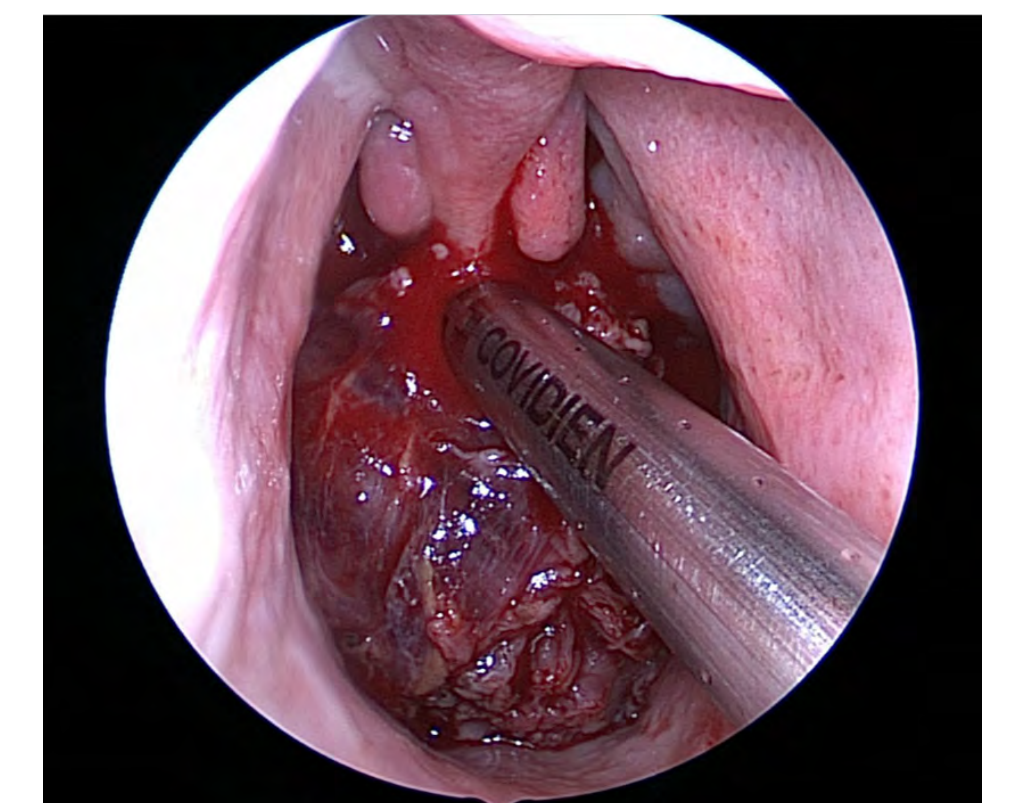


Figure 5. Laparoscopic tacking of the free tissue visualized endoscopically.

Results

Postoperative CT scans demonstrated abutment of the free tissue to the dura, disrupting the connection between the nasopharynx and the brainstem (Figure 6). Postoperative endoscopic evaluation of the free flap demonstrated healing of the free flap tissue with adequate coverage of the nasopharyngeal defect (Figure 7). There has been no recurrence of meningitis.



Figure 6 and 7. Postoperative sagittal CT and endoscopic view demonstrating adequate coverage of the nasopharyngeal defect.

Discussion

This patient's chronic osteomyelitis was not amenable to local reconstructive means. Therefore, free tissue transfer was the only option to mitigate the life-threatening sequelae of her infection. Free flap reconstruction has been previously described in the setting of osteoradionecrosis (ORN) of the cervical spine and skull base.^{7,9} Radial forearm free flaps have been utilized for ORN of the cervical spine with inset done transorally. In the setting of skull base neoplasms, free flap placement is commonly accomplished in an open procedure. In our case, we desired a myogenous flap, which would allow for the placement of vascularized tissue into the defect with subsequent mucosalization. Additionally, utilizing a tacking device allowed for endoscopic inset and evaluation. Notably, a radial forearm would have not fit well into this defect and a facial translocation procedure would not have been ideal given the nature of her disease.

Conclusions

Reconstruction of complex skull base defects may be accomplished with free tissue transfer via an endoscopic transnasal and transcervical approach and should be considered in those individuals requiring coverage not feasibly obtained from local tissue advancement.