A Novel Endoscopic Technique for Failed Nasogastric Tube Placement

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Abstract
Direct visualization of the nasopharynx gives the otolaryngologist a unique advantage for addressing difficult nasopharyngeal anatomy. One common situation is being consulted to assist when the blind placement of a nasogastric tube has failed. A novel technique for managing a patient with a nasogastric tube embedded in the adenoid remnant is described with illustrations. The atraumatic method is easily employed by a resident armed with a portable nasolaryngoscope and plain suture. By using a repeated pull-through technique, the nasogastric tube can be guided past difficult nasopharyngeal anatomy and into a position from where it can be advanced into the patient's esophagus.

Keywords
nasogastric tube, endoscope, nasolaryngoscope

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Nasogastric (NG) tube placement is a common modality used in the inpatient setting for management of the upper digestive system. It provides a rapidly placed, short-term solution for bypassing the oropharynx and esophagus to feed the stomach or, alternatively, to decompress the stomach of air or gastric contents. Under normal circumstances, it is technically simple for inpatient staff to advance a lubricated tube through the patient’s naris, over the soft palate, and down into the hypopharynx. Placement becomes problematic anytime anatomical derangement impedes this blind passage.

Case Report
The patient of interest was a 59-year-old man with a small-bowel obstruction admitted by general surgery for overnight decompression. On-call otolaryngology was requested at the bedside after repeated failed attempts at blind NG tube placement (16Fr Salem Sump; Covidien, Mansfield, Massachusetts) by the ward nursing staff, general surgery intern, chief resident, and attending. The patient was experiencing discomfort localized deep between his eyes. He denied prior nasal trauma, head and neck surgery, visual disturbance, cephalgia, or dyspnea.

Complete head and neck physical examination was benign except for blood products in the posterior oropharynx. After nasal administration of aerosolized lidocaine/oxymetazoline, portable nasolaryngoscopic examination (ENT-4500; Vision Sciences, Orangeburg, New York) was remarkable only for a traumatized adenoid remnant. The NG tube was slowly advanced under direct endoscopic visualization. Measuring with the centimeter markers on the tube showed that the anterior-posterior diameter of the nasopharynx from soft palate to adenoid remnant was less than 1 cm. This resulted in the tip of the tube embedding in the adenoid remnant before the NG tube’s flexible curvature allowed for inferior passage over the soft palate (Figure 1). Gentle rotation did not provide any inferior tip deflection.

Figure 1. Nasogastric tube embedded in adenoid pad before the tube’s flexible curvature allowed for inferior passage over the soft palate.
The key to placement would be bending the NG tube inferiorty. The patient’s oropharynx was anesthetized with additional aerosolized lidocaine/oxymetazoline. The nasolaryngoscope was passed into the posterior oropharynx. The distal scope was grasped with DeBakey forceps and drawn out of the mouth. Plain Vicryl suture was tied to the end of the scope (Figure 2a). The scope and suture were then withdrawn from the naris. The suture was cut and tied to the NG tube’s distal port (Figure 2b). The tube was then advanced under direct visualization via the opposite naris and stopped short of the adenoid. Gentle tension on the suture deflected the tip inferiorly (Figure 2c). Once clear, the NG tube was advanced into the oropharynx and out of the mouth. The suture was removed, and the tube was directed into the hypopharynx (Figure 2d). With the patient cooperatively swallowing, the NG tube was placed without further incident. Discussion of this case was approved as exempt by the Institutional Review Board, San Antonio Military Medical Center.

Discussion

This method provides a rapid, low-technology approach to difficult nasopharyngeal anatomy with tools easily accessible to the overnight resident. Other methods of guiding an NG tube past difficult anatomy have been described. Srouji and Ingrams1 use half of a dissolvable gel capsule to join the tip of a gastroendoscope adjacent to the tip of a NG tube. The now-joined endoscope and NG tube are guided through the nose, past any anatomical derangement in the pharynx, into the esophagus, and down into the stomach. Gastric acid dissolves the gel cap, and the endoscope can be removed after fixing the NG tube in place.4 Der Kureghian et al2 and Siu et al3 described various methods of binding the endoscope and NG tube with absorbable suture instead of a gel cap. Similarly, this technique relies on gastric acid dissolving the suture and allowing for separation of the endoscope from the NG tube.2,3

Some in the gastroenterology community describe a Seldinger technique using a multichannel operating gastroscope and a guidewire. Once the guide wire is in the stomach and held in place, the endoscope is removed. The NG tube is then passed over the wire into the stomach, and the wire is finally removed.4 Similarly, the interventional radiology literature has described using video fluoroscopy to visualize guidewire localization to the stomach for transnasally placing NG tubing in a Seldinger fashion over the wire.5

These methods are beneficial where anatomical derangement requires guided visualization through the pharynx and esophageal inlet. For the clinical situation described above, guidance was needed only past the nasopharynx. The previously published techniques limit the size of the NG tube and require more advanced equipment. The side-by-side combination endoscope–NG tube ultimately limits the size of tube that can be advanced through the patient’s nasal passage. For the patient needing gastric decompression, a larger NG tube is more desirable. The novel pull-through technique allows use of the largest NG tube that the patient’s nasal passage will accommodate. The operative endoscope and video equipment are cumbersome and not tools “carried” by an overnight resident. A fluoroscopic procedure is difficult to arrange in the middle of the night when quick placement of the NG tube is required. The new technique does not require any additional items beyond what the resident already carries or has available and is usable with any tube (eg, Dobhoff) that can be securely tied with suture.

Conclusion

This alternating pull-through technique uses plain suture to overcome difficult nasopharyngeal anatomy. It is rapid, atraumatic, and easily employed at the bedside. The otolaryngologist’s familiarity with nasopharyngeal anatomy and portable endoscope are unique benefits when assisting consulting services. Disseminating this capability through publication will hopefully reduce painful iatrogenic encounters and improve patient care.

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Author Contributions

Andrew G. Boston, conception, design, drafting and revising, final approval, and accountability for the work.

Disclosures

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