Treatment of “Asymptomatic” Zenker’s Diverticulum: The Importance of Open Techniques in a Complex Presentation

Joel E. Portnoy, M.D., Tucker M. Harris, M.D., and Sydney C. Butts, M.D.

Abstract

EDUCATIONAL OBJECTIVE: At the conclusion of this presentation, participants should be able to demonstrate understanding of the modern management of Zenker’s diverticula and discuss when open techniques may be essential for proper management.

OBJECTIVES: To present a case describing the incidental finding of a Zenker’s diverticulum during exploration for a parathyroid adenoma and discuss decision making in diagnosis and management in complex presentations.

STUDY DESIGN: Case report.

METHODS: A single case was reported and relevant literature was reviewed.

CONCLUSIONS: 1) Endoscopic management of Zenker’s diverticulum, though less invasive and less morbid, does not completely replace conventional techniques, especially in complex situations such as diverticulum perforation; and 2) preoperative imaging such as ultrasound and/or CT/MRI is useful in differentiating pathology and defining relevant anatomy preoperatively before surgically exploring the neck.

Introduction

The development of minimally invasive techniques in modern times has led to the replacement of many effective, albeit more invasive, procedures previously considered the standard of care for particular ailments. Because these procedures have reduced morbidity and length of hospital stay, the tendency is to disregard the previously established method in situations deemed appropriate for a minimally-invasive approach. In doing so, these long-practiced approaches are rarely utilized, and thus rarely imparted on residents, if even at all. The following report discusses the case of the inadvertent intraoperative discovery of a Zenker’s Diverticulum and the complicated management that ensued.

Case Description (continued)

A 71-year-old woman presented to a general surgeon with asymptomatic primary hyperparathyroidism (PTH = 79.9, total serum calcium = 11.6 and hypercalciuria). The patient denied globus sensation, dysphagia, regurgitation or hiatitis. No cervical masses were noted on physical examination. Sestamibi scan was nonlocalizing, and an ultrasound revealed fairly small parathyroid glands and no evidence of abnormal neck masses.

After resection of a left enlarged inferior parathyroid gland, a mass without a tapered base was encountered adjacent to the right superior parathyroid gland, tracking posteriorly toward the esophagus. Dissection of the mass from surrounding tissue resulted in its decompression with extrusion of air and clear fluid. An intraoperative Otolaryngology consultation was consequently obtained for direct laryngoscopy and esophagoscopy. The endolarynx and hypopharynx were without signs of observable injury and no diverticula or damage to the cervical esophagus were noted. The decision was then made by the general surgeon to terminate the case.

The patient was discharged on postoperative day one, with normal calcium and parathyroid hormone levels. On the second postoperative day, the patient developed progressive right neck pain with fever, leukocytosis and dysphagia. A CT scan of the neck with contrast revealed a fluid and air-filled cavity adjacent to the right thyroid lobe measuring 5.7 centimeters vertically and 1.5 centimeters in diameter. It also appeared to communicate with the cervical esophagus. The patient was readmitted to the hospital for intravenous antibiotics and was instructed to abstain from enteral nutrition.

The primary surgeon re-explored the wound on postoperative day three, revealing a right-sided cavity of gelatinous, turbid fluid. The cavity did not extend to the mediastinum, but partly extended to the contralateral side. After debridement and copious irrigation of the cavity, two 7mm Jackson-Pratt drains were placed with one in the space next to the right parathyroid and the other next to the left.

Postoperatively, the patient required total parenteral nutrition and Otolaryngology was consulted for further recommendations. An Omnipaque swallow study revealed a moderate-sized Zenker’s diverticulum extending into the right lateral neck with extravasation of contrast into the right neck soft tissue. Suction drain output continued to consist of salivary contents despite improvement in the patient’s symptoms. A repeat swallow evaluation eleven days after the initial study revealed a persistent leak tracking from the sac toward the skin, indicating the presence of a diverticulocutaneous fistula. The patient was scheduled for an open diverticulectomy.

The Otolaryngology service performed a laryngo-esophagoscopy, excision of the diverticulocutaneous fistula, diverticulectomy and cricopharyngeal myotomy. Rigid esophagoscopy revealed the origin of the Zenker’s diverticulum without further injury to the esophagus distally. A nasogastric tube was placed and a transverse skin incision was made incorporating the fistula tract. The connection from the fistula tract to the esophagus was identified. (Figure 2) The nasogastric tube was palpated within the esophagus to serve as a deep landmark, ensuring that the diverticulectomy incorporated the base of the diverticulum. The mucosal layer of the esophagus was closed by inverting the wound edges followed by oversewing of the muscularis. Next, the cricopharyngeal myotomy was performed. No leak of methylene blue was present after the nasogastric tube was then retracted proximal to the esophageal repair site and flushed. The cutaneous wound was irrigated and closed primarily over suction drains. Six days after the diverticulectomy, Omnipaque and barium swallow studies revealed no leakage of intraluminal contents. The patient was discharged two days afterward. One month after discharge the patient noted no dysphagia, problems with oral diet, fevers, aspiration or neck tenderness and her wounds were well-healed. Four months after discharge repeat barium swallow showed no leak and the patient remains asymptomatic one year postoperatively.

Discussion (continued)

and aspiration. Diagnosis of Zenker’s diverticulum most commonly is made from clinical suspicion and a barium swallow. This pharyngoesophageal diverticulum enlarges inferiorly between the esophagus and the proximal cervical esophagus.

In the presented case, preoperative ultrasonography did not detect the Zenker’s diverticulum. Various case reports describe its confusion for thyroid nodules on ultrasonography. Inadvertent fine-needle aspiration of Zenker’s diverticula has been described for presumed thyroid nodules based on these similarities. Although pharyngoesophageal diverticula have been incidentally reported on ultrasonography of the neck, their reliable detection using this imaging modality is not well-established.

Zenker’s diverticulum is primarily treated surgically, though watchful waiting may be employed in asymptomatic or frail patients. Classical surgical management of Zenker’s diverticula is via an open cervical approach. With the advent of and innovations in advanced endoscopic techniques, transoral endoscopic stapling diverticulotomy (ESD) has become the gold standard treatment in suitable patients, achieving similar results with decreased operative time, shorter length of hospital stay and less overall morbidity. While endoscopic techniques are being utilized more frequently, it remains important for surgeons to maintain familiarity with open techniques for cases not amenable to endoscopic methods or if complications develop after endoscopic stapling.

Guidelines exist to assist in management in the setting of enteral lumen integrity violation. Classic management of esophageal perforation involves operative treatment, though nonoperative approaches have been described for well-contained perforations of the cervical esophagus with the potential for lower morbidity. Nonoperative management includes broad-spectrum intravenous antibiotics and parenteral nutrition in addition to cessation of oral intake with nasoenteric gastric enteral decompression. If the patient’s condition does not improve, such as in the case of our patient, surgical management should be attempted. Initial surgical intervention of cervical esophageal perforation includes drainage of collections in the area surrounding the perforation site. If conservative surgery fails, further steps ranging from primary closure of the breach to resection of the perforated segment must be considered.

As in situations of esophageal perforation, the Zenker’s diverticulum perforation in the index case presents a situation where the endoscopic approach would not effectively manage the breach of the esophageal lumen. Not only is visualization incomplete, achieving adequate multi-layer closure of the defect would be exceedingly challenging given the small operating field through the endoscope and the intralaryngeal requirement for watertight closure. An open approach provides improved visualization as well as a better chance of completely resecting all perforated tissue.

Conclusions

Zenker’s diverticulum is a common entity with which surgeons operating in the neck must be familiar. In the presented case, an undiagnosed diverticulum was missed for a parathyroid adenoma and was disrupted. Initial management with wound closure over suction drainage and parenteral nutrition was inadequate, resulting in formation of a diverticulocutaneous fistula. Ultimately a lasting solution was achieved with open diverticulectomy and fistula closure, as an endoscopic approach was contraindicated in light of the esophageal perforation. No clear guidelines have been established regarding this specific situation; however, the literature concerning management of other types of esophageal perforation provides some direction. It is the opinion of the authors that timely primary repair should be strongly considered to avoid complications and the need for a significantly more challenging diverticulum excision in the future. For this to be plausible, knowledge of open procedures, in addition to less invasive techniques, must be retained by established surgeons and imparted on future generations of their pupils.

References

3. Sestamibi scan was nonlocalizing, and an ultrasound revealed fairly small parathyroid glands and no evidence of abnormal neck masses.