Urgent Endoscopic Stapler Zenker's Diverticulotomy in Acute Aphagia

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Zenker's diverticulum (ZD) is an outpouching of the mucosa through Killian's triangle, an area of muscular weakness between the transverse fibers of the cricopharyngeus and the oblique fibers of the lower inferior constrictor. ZDs are usually discovered in older male patients who may be symptomatic (difficulty swallowing, foul breath, gurgling in the throat, regurgitation of food into the mouth, pulmonary aspiration) from weeks to years [1]. Severe cachexia can also be present in patients with long-standing dysphagia. The mainstay of treatment of symptomatic ZD has traditionally been transcervical diverticulectomy (TCD) to eradicate the sac and restore the normal esophageal anatomy.

Since the 1960s, the endoscopic approach has gradually become the preferred surgical option for the treatment of symptomatic ZD. Endoscopic stapler diverticulotomy (ESD) is reportedly safe and effective and has a shorter operative time, shorter hospital stay, shorter convalescence time, and more rapid return to a regular per-oral diet. ESD is lower in cost, has fewer complications and has lower morbidity rates compared with TCD in the treatment of ZD [1,2]. However, both TCD and ESD are rarely used as urgent procedures because most patients seek treatment due to worsening of the dysphagia and deterioration in their quality of life and therefore have time to undergo elective surgery. There are no guidelines for determining whether endoscopic diverticulotomy or TCD is the procedure of choice for aphagia due to ZD when an intervention is urgent, and few relevant data are available in the literature. We present a rare case of urgent ESD for acute aphagia due to ZD.

PATIENT DESCRIPTION

A male in his seventies presented to our Emergency Department due to acute aphagia. He had a long history of ZD with gradual weight loss, and reported a recent severe deterioration of his condition during the previous 2 months, accompanied by a weight loss of about 14 kg. His recent medical history also included a bout of pneumonia. His past medical history was significant for asthma and partial gastrectomy and vagotomy for a bleeding pyloric ulcer.

The patient was hemodynamically stable and his vital signs were within normal limits on admission. His physical examination was significant for cachexia and dehydration. A complete blood count showed a low hemoglobin level (11.5 g/dl). Electrolytes, creatinine and urea were all within normal limits, except for mild hyperchloremia (112 mg/dl) and mild hypophosphatemia (2.46 mg/dl). His albumin and total protein levels were decreased (33 g/L and 60 g/L, respectively). A chest X-ray showed an air pocket at the neck level but its borders and exact size were not well defined. Since the patient had total aphagia, we elected to perform computerized tomography (CT) of the neck and not conduct a barium swallow esophgography. CT demonstrated a 50 x 18 x 43 mm air-filled pocket off the esophagus at the level of the C7 to T2 vertebras [Figures 1A and B].

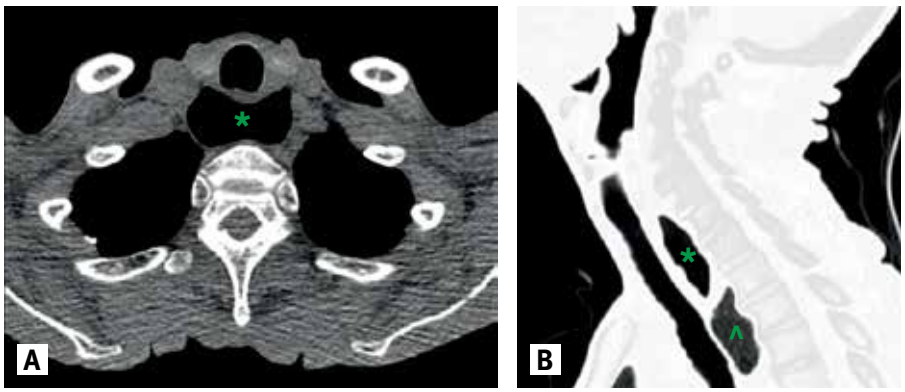

Figure 1.
[A] Axial computed tomography of the neck at the level of T2. The air-filled dilatation of the esophagus (*) is indicative of Zenker's diverticulum.

[B] Sagital computed tomography of the neck at the level of the epiglottis. An air-filled pocket posterior to the cervical esophagus (*) is suggestive of Zenker's diverticulum. ^marks the left lung apex

Initial treatment consisted of intravenous fluids with dextrose resuscitation but was not therapeutic. The following day we opted to perform rigid esophagoscopy with the intention to proceed to ESD, if found technically possible, based on the advantages of ESD over TCD [1,2]. An urgent rigid esophagoscopy with the Weerda laryngoscope was performed by our ESD team (an otolaryngologist and a general surgeon). Since visualization of the esophageal inlet, upper esophagus and ZD (full of undigested food) was possible, we proceeded to ESD applying and firing an Endo-GI stapler to the dividing wall between the ZD and the esophagus three times for full diverticulotomy.

The procedure was uneventful and the patient was started on a soft per-oral diet on the first postoperative day. His postoperative course was complicated by lower-limb edema, which gradually resolved. He was discharged on the sixth postoperative day on a regular per-oral diet. At 3 months after undergoing ESD, he reported that the dysphagia had not recurred, he had gained 17 kg and was following a regular oral diet.

COMMENT

ZD has been treated effectively and safely by means of the endoscopic approach since the 1960s, but whether it or TCD is the procedure of choice in the urgent setting of acute aphagia due to ZD has not been established. In a recent systematic review [2] on treatment of ZD, a higher failure rate of ESD compared to TCD was found (18.9% vs. 4.2%); however, complications and mortality rates were higher when performing TCD compared to ESD (11% and 0.9 vs. 7% and 0.4%).

Most patients with ZD undergo surgical treatment in an elective setting earlier in the course of the disease due to deterioration in their quality of life. As a result, little has been published on patients who require urgent intervention for acute aphagia due to ZD, and there are no reports on the safety and outcome of ESD in that setting. Buda et al. [3] described their experience with TCD as a rescue procedure in two semi-emergent cases of patients with severe dysphagia due to ZD that required immediate definitive treatment. They elected to perform TCD in one patient after failure of nasogastric tube insertion under fluroscopy, and in another patient after failure to perform per-oral gastrostomy due to inability of the endoscopist to see the esophageal inlet.

Elderly patients with ZD present a surgical challenge due to malnutrition, frailty, recurrent infections due to aspirations, catabolic state due to long-term starvation with low reserves, non-optimal medical treatment of their background diseases, contraindications for general anesthesia, and spinal deformities. Van Overbeek [4], however, concluded that ESD is safe and recommended even for the elderly. The course in our elderly patient supports that author's claim.

The utilization of ESD for urgent intervention due to sudden and total aphagia at the setting of acute inflammatory state of the sac and esophagus (as suspected by the sudden onset of total aphagia and confirmed clinically during the esophagoscopy when an edematous and erytemayous esophageal wall was noted) may pose a surgical challenge due to the possible higher risk of esophageal perforation and its grave consequence of mediastinitis. In comparison, Hicks and fellow researchers [5], who analyzed the surgical outcomes of patients undergoing urgent vs. elective surgery for ulcerative colitis, found that anastomotic leaks and long-term complications were similar between the groups, but that surgeon inexperience was associated with increased odds of long-term fistula/abscess. Therefore, in cases for which it is technically feasible and not ruled out by clinical considerations, ESD advantages over TCD suggest that it is the preferential surgical approach for ZD. However, a high level of skill and caution should be practiced in order not to cause trauma to the esophageal wall, perforation and mediastinitis.

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Capsule

Aging and variability among immune cells

How and why the immune system becomes less effective with age are not well understood. Martinez-Jimenez et al. performed single-cell sequencing of $CD4^+$ T cells in old and young mice of two species. In young mice, the gene expression program of early immune activation was tightly regulated and conserved between species. However, as mice aged, the expression of genes involved in pathways responding to immune cell stimulation was not as robust and exhibited increased cell-to-cell variability.

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