

Experience in the treatment of Zenker's diverticulum: a series of 18 cases

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Abstract

Zenker's diverticulum is a rare pathology that appears in elderly people. To avoid complications from endoscopic procedures and to suitably treat this pathology, it must be identified early.

Methods. This retrospective descriptive study shows the experience of our unit in treating this entity from July 2005 to July 2010. Patients who became candidates for treatment were handled either surgically or endoscopically. Both of these techniques are described in detail.

Results. Altogether 18 patients were included. Initial diagnoses were by upper digestive tract endoscopy. The 13 male patients (72%) had an average age of 70.5 years. In 67% of the patients the main symptom was dysphagia. There were incidental endoscopic findings in 17% of the patients. Nine patients had endoscopic diverticulectomies, six rejected all treatment, and three were treated surgically.

Conclusion. In conclusion, Zenker's diverticulum is a rare pathological entity that does not necessarily require treatment. With increased experience in therapeutic endoscopy, and the accessories now available, endoscopic diverticulectomy has become a very good option, with a low rate of complications, for treatment of these patients.

Key words

Diverticulum, Zenker's diverticulum, endoscopy, dysphagia.

Zenker's Diverticulum is a hernia of the posterior hypopharyngeal membrane proximal to the upper sphincter of the esophagus. It occurs in the anatomical area known as Killian's Triangle (2) located between the oblique fibers of the inferior constrictor muscle of the pharynx and the transverse fibers of the cricopharyngeus muscle (Figure 1). Its name is in honor of the German Pathologist Friedrich Albert Von Zenker who, together with Von Ziemssen, described it in detail in an 1878 report of 23 cases from the University of Erlangen. However, it must be made clear that this formation was first described by Dr. Abraham Ludlow in 1769 (1).

There are multiple hypotheses and mechanisms attributing the formation of Zenker's diverticulum to factors such as hypertrophy, premature contraction of the cricopharyngeus muscle, abnormalities of relaxation, and a second

deglutition movement with a closed upper esophageal sphincter (UES) (3-7). Since the greatest incidence of this disorder occurs between the seventh and eighth decades of life, its development has been associated with changes related to age that affect the functioning and relaxation of the UES (8-9). The relation between alterations of the lower inferior esophageal sphincter and gastroesophageal reflux that generates hypertonia of the upper esophageal sphincter with increase of the pressure and protrusion of the hypopharyngeal mucous is not clear (10).

On the other hand, given the low prevalence of this pathology in our country we have little experience in the treatment of this condition. This is especially true for new treatments such as the endoscopic technique. For this rea-

son, we have undertaken this study which shows a series of cases of patients with Zenker's diverticulum at a single medical center.

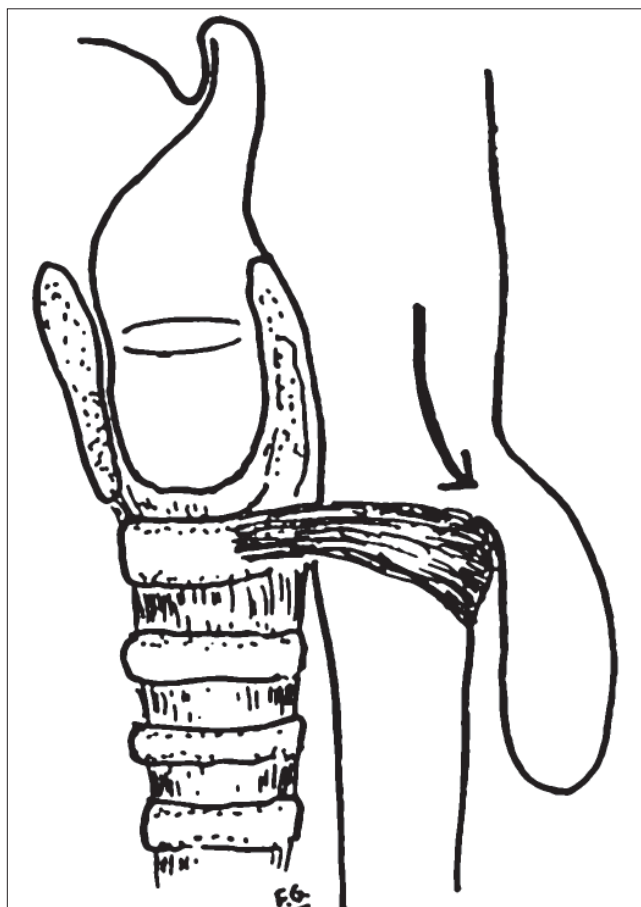


Figure 1. Anatomical representation of Zenker's Diverticulum.

MATERIALS AND METHODS

This is a retrospective descriptive study which presents the experience of our unit in the treatment of this entity from July 2005 to July 2010. Candidates for treatment were treated either surgically or endoscopically.

Surgery was performed under general anesthesia using transoral stapling and with direct laryngoscopy. To staple the linear mechanical suture the anvil was placed in the diverticulum and the cartridge in the esophagus. Afterwards, cutting and suturing is done up to the bottom of the diverticulum at both ends of the bridge that separates the esophagus from the diverticulum forming a common chamber from the two.

Endoscopic treatments were performed with the patient in left lateral recumbent position under general anesthesia.

We proceeded via a nasogastric catheter guided by endoscopy with or without guide according to positioning difficulty. This allows better identification of the diverticulum (Figure 2) and allows the physician to separate the wall of the esophagus.

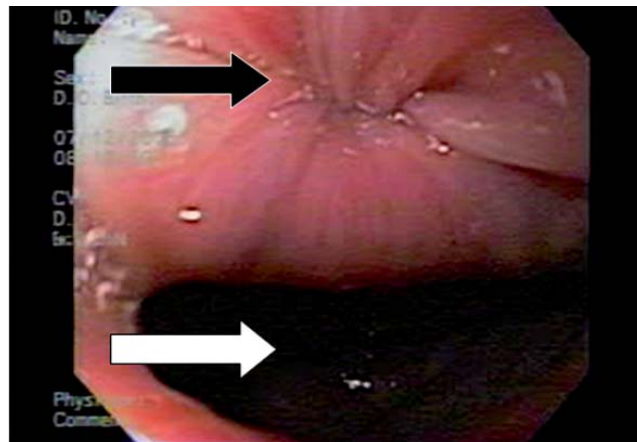


Figure 2. The diverticular sack is clearly observable in the lower half of this photo as indicated by the white arrow. The gullet is in the upper half. It is completely stenosed by the traction generated by the diverticulum (indicated by the black arrow).

In the initial cases needle knife papillotomy was used (Figure 3) to cut the mucosa. In all cases coagulation current was initially used to control bleeding (common in every medical procedure). Subsequently, mixed electrosurgical current was used when the muscle was accessed, this method continued during the rest of the process.



Figure 3. Initial cut into the mucosa, traditionally done with the needle knife papillotomy.

In order to avoid complications, in every case we tried not to cut all of the septum. In the last two cases a ceramic

tipped scalpel was used. This made the procedure easier for us because it allows us to perform the cut more safely in the initial phase (mucous cut) since its tip can press on the septum without the fear of piercing the gullet wall as commonly happens with needle knife papillotomies (Figure 5). Prophylactic antibiotics were not used.

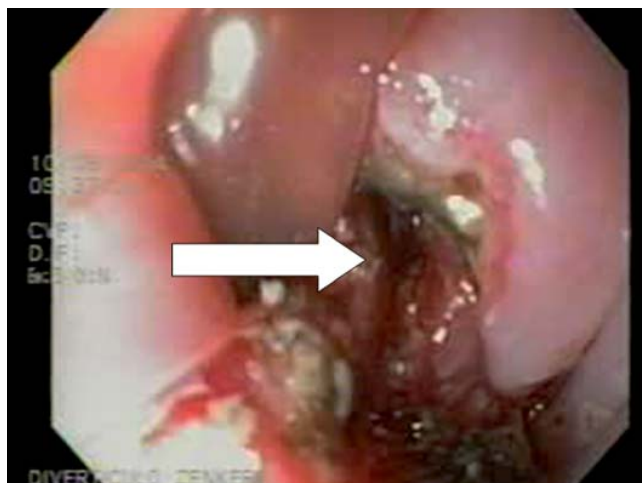


Figure 4. Muscle cut with needle knife papillotomy with mixed current until more than 50% is surpassed.



Figure 5. Note how the ceramic tip papillotomy knife (black arrow) can be leaned against the septum (white arrow) since its tip cannot pierce the esophageal wall.

After the procedure, the nasogastric catheter is kept in the patient for 24 hours. Diet tolerance is tested, and if it is adequate, the patient is discharged with recommendations, indications and warnings.

RESULTS

Eighteen patients, thirteen male (72%) and five female (28%), who had had Zenker's diverticula over the 5 years from 2005 to 2010 were included. Average patient age was

70.5 years (Table 1). Patients were either clinically observed or treated surgically or endoscopically. Initial diagnoses were made by means of upper digestive tract endoscopy. Symptoms presented were, in order of frequency: dysphagia (67% of cases), incidental findings in endoscopy (17%), impacted foreign body in the diverticulum (11%), dysphagia and regurgitation (5%).

Nine patients had endoscopic diverticulectomies conducted by the Gastroenterology Unit according to the previously described technique. Six patients, who had only minor symptoms, rejected treatment and opted for medical examinations and follow ups. Finally, three patients were treated surgically as described above with mechanical sutures.

DISCUSSION

Prevalence of Zenker's Diverticula varies between 0.01 and 0.11% (11). Most patients are asymptomatic, and male patients between their seventh and eighth decade of the life predominate (13 of the 18 cases in our series) (12). Considering that we performed 200 endoscopies during the study period, the prevalence of this entity for us was 0.13% which is very similar to the prevalence reported in the literature.

Symptoms usually consist of dysphagia, regurgitation, halitosis or the sensation of an esophageal mass. Zenker's Diverticula may also present itself through a persistent cough, odynophagia, a sore throat or aspiration pneumonia (13). Nevertheless, many cases are diagnosed incidental to an examination for some other reason. This was the case in 17% of our sample. Occasionally a patient comes to the emergency room with an impacted object and is then diagnosed with Zenker's Diverticulum, as happened in 5% of our cases.

The most appropriate diagnostic method for detecting this anomaly is a barium esophagogram with lateral projection of the barium swallow to view the hypopharyngeal area. Brombart's classification allows categorization of the degree of compromise from these diverticula according to radiological findings (14). Nevertheless, in the usual scenario we deal with, the patient presents dysphagia which requires an upper digestive tract endoscopy. It is of great importance that those who perform these procedures have a high degree of suspicion that elderly patients who come in with dysphagia may have Zenker's Diverticula. This is especially important in light of the high risk of perforation during this procedure (15).

Therapeutic measures for Zenker's diverticulum include surgical treatment and endoscopic treatment. Surgical treatment can be transoral with surgical stapling or more invasive through lateral cervicotomy with or without cri-

Table 1. Patients with Zenker's Diverticula.

Patient	Gender	Age	Symptoms	Treatment	Evolution
1	Male	79	Dysphagia	Surgical	Good
2	Male	65	Dysphagia	Endoscopic	Good
3	Male	81	Incidental	Surgical	Good
4	Female	73	Dysphagia and regurgitation	Endoscopic	Good
5	Male	80	Dysphagia	Observation	
6	Female	85	Dysphagia	Endoscopic	Good
7	Male	77	Dysphagia	Observation	
8	Female	77	Dysphagia	Observation	
9	Female	73	Dysphagia	Endoscopic	Good
10	Male	67	Incidental	Observation	
11	Male	74	Dysphagia	Endoscopic	Recurred
12	Male	71	Incidental	Endoscopic	Good
13	Male	72	Dysphagia	Endoscopic	Good
14	Male	83	Dysphagia	Observation	
15	Male	57	Dysphagia	Observation	
16	Female	73	Dysphagia	Endoscopic	Good
17	Male	63	Foreign body	Surgical	Good
18	Male	47	Dysphagia	Endoscopic	Good

copharyngeal myotomy. Since this method may result in complications such as mediastinitis, infection of the superficial operating site, paralysis of the recurrent laryngeal nerve and fistula, its use has been abandoned.

The pioneer of endoscopic treatment for Zenker's diverticulum was Dr. Mosher. In 1917, he used a rigid endoscope and separated the esophageal diverticulum. His method, however, sometimes resulted in mediastinitis as its main complication. In 1932, the technique was modified by Seiffert, although Dohlman and Matson were the first to successfully perform diverticulectomies through using endoscopic vision and electrocoagulation in procedures to separate the diverticular wall from the esophageal wall. In 1982, Van Overbeek introduced the use of a CO₂ laser to the technique, and in 1993, Collard and colleagues in Belgium and Martin-Hirsch and Newbegin in the United Kingdom, independently described diverticulectomies using mechanical sutures (16).

In 1995 Ishioka and Sakai's group in Sao Paulo, Brazil reported the first series of patients treated by means of ambulatory flexible endoscopy (17). Although the endoscopic treatment can technically be performed on any patient, it has been especially recommended for individuals with concomitant diseases that imply complications and risk from general anesthesia, and for those patients with severe osteoarthritis who risk spinal injury from hyperex-

tension of cervical spine (1, 17-19). There are other high risk factors for serious complications such as mediastinitis with small diverticula. The implications of UES myotomies in patients with hiatal hernia and GERD are still controversial (19).

Table 2 shows the endoscopic series published to date and compares them with ours. We must add that our series, which includes only 9 treated patients, is small. In spite of this, both our success with the procedure and our low rate of complications agree with what has been reported in the current medical bibliography (20). We must also add that although many authors perform this endoscopic procedure under sedation, our group considers that it should always be performed using orotracheal intubation since there is bleeding in almost every case. Its use can be reduced at the beginning phase of coagulation current. Another useful tool during the beginning phase is the ceramic tipped papillotomy knife which can lean on the septum without causing perforation of the esophageal wall.

In conclusion, Zenker's diverticulum is a rare pathological entity that does not necessarily require treatment in all cases. As experience in therapeutic endoscopies has increased, and as more accessories have become available, endoscopic diverticulectomies can now be performed with low complication rates. Consequently they have become a very good option for the treatment of these patients.

Table 2. Reports of the experience of workgroups with Endoscopic Diverticulectomies (1).

First Author	Year	Number	POP Diet, Hours	Complications		Recurrence		Hospital stay in hours	Follow-up Time
				Number	Percent	Number	Percent		
Ishioka	1995	42	NA	2/42	5%	3/42	7,1%	NA	38 months
Hashiba	1999	47	24	7/47	14%	2/47	4%	Ambulatory	1 d to 1 year
Sakai	2001	10	48 h	0	NA	0	NA	NA	2 a 12 months
Morena	2005	3	48h	0	NA	0	NA	48	15 months
Vogelsang	2006	31	NA	7/31	23%	10/31	32	NA	26 months
Costamagna	2007	39	NA	9/39	23%	9/39	23	72 h	36 months
Al Kadi	2010	18	24 h	1/18	6%	2/18	11%	24-48h	27.5 months
Gómez	2010	9	12 h	1/9	11%	1/9	11%	24 h	25 months

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