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Case Report

Diagnostic approach and treatment of Zenker's diverticulum

David Eduardo Torres Ordaz*, Jose Ignacio Diego Perez Montes, Leonel Lozano Lugo, Leonel lturbide Mauricio

Department of Surgery, High Speciality Medical Unity 71, Mexico

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***Correspondence:**
Dr. David Eduardo Torres Ordaz,
E-mail: leon.loz1612@gmail.com

ABSTRACT

Pharyngoesophageal diverticulum have many subtypes, Zenker's diverticulum being the most common of them. Accounting from 70 to 75% of all esophageal diverticula. The 50% of these occur between the seventh and eighth decade of life. The most common symptom is dysphagia. The predominant symptom of ZD is dysphagia and the most serious is pulmonary aspiration. A 68-year-old female attended a general surgery consultation with progressive dysphagia, weight loss, regurgitation and halitosis. Laboratory studies showed normal, while the upper gastrointestinal series (UGI) showed stasis in the upper part of the esophagus. Digestive panendoscopy revealed Zenker's diverticulum, diverticulectomy and cricopharyngeal myotomy were performed. Zenker's diverticulum is diagnosed through radiological studies and endoscopy. Surgical management is necessary due to the list of complications if left untreated.

Keywords: Zenker's diverticulum, Esophageal diverticulum, Pharyngeal muscles, Cricopharyngeal myotomy

INTRODUCTION

Hypopharyngeal diverticula, also known as pharyngoesophageal diverticula, were first recognized in the medical literature more than 200 years ago.[1] To date, various types of diverticula have been described: Zenker diverticulum (ZD), Killian-Jamieson diverticulum, Laimer's and traction diverticulum. ZD is the most common, occurring in an estimated 0.01 to 0.11 percent of the population.[2]

ZD is a posterior pharyngoesophageal pouch that forms by pulsion forces in an area of relative weakness of the hypopharyngeal wall between the oblique fibers of the inferior constrictor of the pharynx and the horizontal fibers of the cricopharyngeal (CP) muscles and deficient upper esophageal sphincter (UES).[3] Surgeon William I. Wheeler performed the first successful excision of the diverticulum in 1886, the basis of treatment for ZD was an open surgical approach through an incision in the neck with a myotomy of the UES and extraction or suspension of the diverticulum.[4]

CASE REPORT

A 68-year-old female, with a history of systemic arterial hypertension, osteoporosis. Her condition began 10 years ago with high dysphagia for solid foods that progressed to liquids, regurgitation of semi-digested foods, halitosis and weight loss, being treated by a medical doctor and symptomatic treatment. Laboratory studies included blood chemistry, blood count, liver function tests, and prothrombin time were normal. The upper gastrointestinal series (UGI) showed the presence of ZD with barium stasis in the upper part of the esophagus with a pouch lesion anterior to the C5 and C6 vertebrae. In the panendoscopy, the esophagus/pharynx was found: with macroendoscopic data of Zenker's pharyngoesophageal diverticulum with partial obstruction that prevents distal advancement followed by the gastroscope.

Surgical intervention of diverticulectomy and cricopharyngeal myotomy was performed (Figures 1 and 2), without the presence of incidents or accidents with

adequate postoperative evolution, the patient was discharged after 3 days of hospitalization.

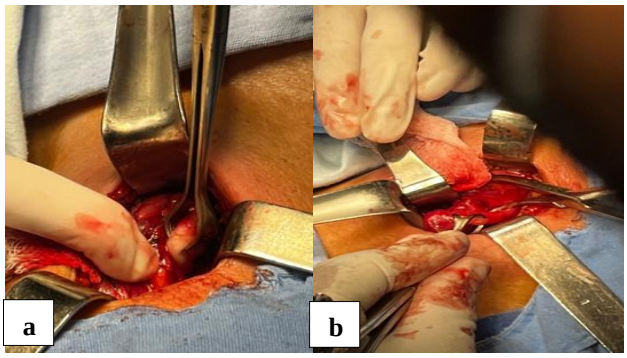

Figure 1 (a and b): Cervical esophagus dissection, presence of Zenker's diverticulum.

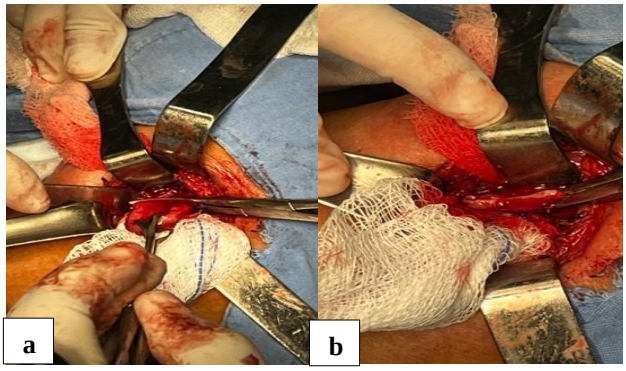

Figure 2 (a and b): Diverticulectomy and cricopharyngeal myotomy.

DISCUSSION

The physiological mechanism of swallowing is complex, involving a coordinated series of events from the oral cavity to the esophagus. The upper esophageal sphincter (UES) is a 2.5 cm area that extends from the distal pharynx to the proximal esophagus, where it plays an important role in the swallowing process.[3] When swallowing, the UES relaxes, allowing food to pass from the hypopharynx to the proximal esophagus. With aging, the cricopharyngeal muscle can become hypertonic, leading to abnormalities in the normal passage of food.[5] As in any pulsion diverticulum, the main pathogenesis is related to an increase in intraluminal pressure that leads to pouching in an area of relative weakness of the wall compared to the surrounding areas.

In ZD, this area of weakness is located in the hypopharynx between 2 strong pharyngoesophageal muscles, the pharyngeal constrictor (PC) and the inferior pharyngeal constrictor.[6] This area is known as Killian's triangle, an area of low pressures of the inferior wall of the hypopharynx that leads to the formation of a posterior pouch. This posterior pouch includes only mucosa and submucosa, so a ZD should be considered a pseudodiverticulum.[7] Zenker's diverticula protrude posteriorly into the retropharyngeal space and generally extend to the left. The larger diverticula protrude laterally into the visceral space.[8]

Clinical presentation

The ZD usually occurs between the seventh and eighth decades of life and rarely before age 40.[7] The incidence varies by region, being more common in northern Europe than in the south. It has been described more frequently in the United States, Canada, and Australia than in Japan and Indonesia.[8] Symptoms may be present for weeks or years before a diagnosis is made.[9] Although a large number of symptoms attributed to ZD have been identified, 80% to 90% of patients complain of dysphagia. There are 2 mechanisms by which the diverticulum can cause dysphagia: incomplete opening of the UES and extrinsic compression of the cervical esophagus by the diverticulum itself.[10] Cervical borborygmus, particularly in the presence of a palpable lump in the neck, is almost pathognomonic of ZD. As the pouch enlarges, dysphagia increases, symptoms become more severe with resulting weight loss and malnutrition. A sudden increase in the severity of dysphagia and regurgitation or development of alarm symptoms, such as local pain and hemoptysis or hematemesis, may indicate the presence of squamous cell carcinoma ulceration within the ZD, which has an incidence of 0.4% to 1.5%.[11-13] Cough and aspiration pneumonia have been described in 30% to 40% of patients.[14]

Diagnosis

The UGI series with a swallow of water-soluble medium, in which we will identify how it will be compressing its lumen and displacing the esophagus, is the most important diagnostic test.[1] At the level of the sternoclavicular joint, the typical outpouching is observed on the dorsal surface of the esophagus, and its size and position can be assessed. Many authors classify ZD by its size, measured in the craniocaudal direction: small (up to 2 cm), intermediate (2-4 cm) and large (4-6 cm).[6]

Dynamic continuous fluoroscopy allows monitoring of the swallowing mechanism and can detect a small diverticulum. Evidence of overflow and aspiration can be observed. Evaluation of the lower esophagus, stomach, and duodenum can detect abnormalities such as hiatal hernia or reflux esophagitis.[2] A non-progressive filling defect or a loss of smooth contour of the interior of the pouch should raise suspicion of carcinoma. Esophagogastroduodenoscopy is not necessary to confirm the diagnosis, but serves to rule out malignancy in the pouch and exclude other conditions responsible for the patient's symptoms, such as reflux esophagitis or tumors.[15]

Endoscopy has a controversial role, given that some authors mention that it is unnecessary and even risky, while others believe that it is complementary by allowing the possibility of structural changes in the mucosa of the

diverticulum to be evaluated. Esophageal manometry can demonstrate the association of the diverticulum with an abnormal response of the cricopharyngeal muscle to swallowing or even with its hypertonia. However, due to the anatomy (very short sphincter) and physiology (sphincter movement during swallowing), the evolution is very complicated.[16]

Treatment

Treatment of ZD is well documented and involves endoscopic or open surgical procedures. A recent systematic review on the treatment of ZD concluded that open surgical procedures are preferable in younger patients and in those with anatomy is not suitable for endoscopy.[17] Flexible endoscopic procedures have been described as an alternative treatment in patients with comorbidities that make prolonged general anesthesia necessary.[18,19] With an open approach, an external incision is made in the neck, at the anterior border of the sternocleidomastoid muscle, usually on the left side given the propensity of the bursa to emerge at this location. Through this incision, the diverticulum can be easily exposed.[20] The pouch can be treated by 3 techniques: inversion, pexy or resection. A larger pocket (>5 cm) is usually removed by closing the opening using a linear stapling device. Moderate-sized diverticulum can be treated with combined diverticulopexy and CP, while a smaller diverticulum is more frequently treated with suspension or CP myotomy.[21] Postoperative complications are rare with any of the methods, the most feared being esophageal perforation, which can cause cervical emphysema, fistula formation and mediastinitis.[22]

CONCLUSION

ZD is a pulsion diverticulum. The most common symptom is dysphagia. The contrast study of the esophagus and the corresponding endoscopy confirms the diagnosis. The appropriate treatment is diverticulectomy and cricopharyngeal myotomy. Endoscopic treatment, according to different authors, is another treatment option.

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REFERENCES

1. Johnson CM, Postma GN. Not all pharyngeal pouches are created equal: management of “non-Zenker” hypopharyngeal diverticula. Oper Tech Otolaryngol Head Neck Surg. 2016;27:80-5.
2. Watemberg S, Laudau O, Avrahami R. Zenker’s diverticulum: reappraisal. Am J Gastroenterol. 1996;91:1494-8.
3. Stewart KE, Smith DRK, Woolley SL. Simultaneously occurring Zenker's diverticulum and Killian-Jamieson diverticulum: case report and literature review. J Laryngol Otol. 2017;131(8):661-6.
4. Yuan Y, Zhao YF, Hu Y. Surgical treatment of Zenker’s diverticulum. Dig Surg. 2013;30:214-25.
5. Boysen M, Aasen S, Lotveit T, Bakka A. Two simultaneously occurring hypopharyngo-oesophageal diverticula. J Laryngol Otol. 1993;107:49-50.
6. Bizzotto A, Iacopini F, Landi R, Costamagna G. Zenker’s diverticulum: exploring treatment options. Acta Otorhinolaryngol Ital. 2013;33:219-29.
7. Ferreira LE, Simmons DT, Baron TH. Zenker’s diverticula: pathophysiology, clinical presentation, and flexible endoscopic management. Dis Esophagus. 2008;21:1-8.
8. Van Overbeek JJ. Meditation on the pathogenesis of hypopharyngeal (Zenker’s) diverticulum and a report of endoscopic treatment in 545 patients. Ann Otol Rhinol Laryngol. 1994;103:178-85.
9. Van Overbeek JJ. Pathogenesis and methods of treatment of Zenker’s diverticulum. Ann Otol Rhinol Laryngol. 2003;112:583-93.
10. Siddiq MA, Sood S, Strachen D. Pharyngeal pouch (Zenker’s diverticulum). Postgrad Med J. 2001;77:506-11.
11. Laing MR, Murthy P, Ah-See KW, Cockburn JS. Surgery for pharyngeal pouch: audit of management with short- and long-term followup. J R Coll Surg Edinb. 1995;40:315-8.
12. Odemis B, Ataseven H, Basar O, Ertugrul I, Yüksel O, Turhan N. Ulcer in the basis of Zenker’s diverticulum mimicking esophageal malignancy. J Natl Med Assoc. 2006;98:1177-80.
13. Bradley PJ, Kochaar A, Quraishi MS. Pharyngeal pouch carcinoma: real or imaginary risks? Ann Otol Rhinol Laryngol. 1999;108:1027-32.
14. Boutou AK, Trigonis I, Pigadas A, Argyropoulou P, Stanopoulos I. Exogenous lipoid pneumonia complicated with mycobacterium infection in a subject with Zenker diverticulum. Ann Acad Med Singapore. 2009;38:177-8.
15. Onwugbufor MT, Obirieze AC, Ortega G, Allen D, Cornwell EE 3rd, Fullum TM: Manejo quirúrgico del divertículo esofágico: una revisión de la base de datos de muestras de pacientes hospitalizados a nivel nacional. J Surg Res. 2013;184:120-5.
16. Rosales-Castañeda E, García-Morán GC, Martínez-Ordaz JL. Surgical treatment of Zenker’s diverticulum. Cir Cir. 2018;86(4):355-8.
17. Verdonck J, Morton RP. Systematic review on treatment of Zenker’s diverticulum. Eur Arch Otorhinolaryngol. 2015;272:3095-107.
18. Mulder CJ, den Hartog G, Robijn RJ, Thies JE. Flexible endoscopic treatment of Zenker’s diverticulum: a new approach. Endoscopy. 1995;27:438-42.
19. Case DJ, Baron TH. Flexible endoscopic management of Zenker diverticulum: the Mayo Clinic experience. Mayo Clin Proc. 2010;85:719-22.

20. Berger MH, Weiland D, Tierney WS, Bryson PC, Weissbrod PA, Shah PV, et al. Surgical management of recurrent Zenker's diverticulum: A multi-institutional cohort study. Am J Otolaryngol. 2021;42(1):102755.
21. Yuan Y, Zhao YF, Hu Y, Chen LQ. Surgical treatment of Zenker's diverticulum. Dig Surg. 2013;30:214-25.
22. Wang NK, Molin NL, Soliman AMS. Postoperative management of Zenker's diverticulum: Results of the American Bronchoesophagological Association survey. Am J Otolaryngol. 2022;43(5):103602.

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