Bilateral Killian-Jamieson diverticula: A case report and literature review

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RD Boisvert, DCG Bethune, D Acton, DR Klassen. Bilateral Killian-Jamieson diverticula: A case report and literature review. Can J Gastroenterol 2010;24(3):173-174.

A Killian-Jamieson diverticulum is an outpouching from the lateral wall of the proximal cervical esophagus. These diverticula are rare and are distinct from the more commonly known Zenker's diverticulum. Literature regarding Killian-Jamieson diverticula and its suggested management is scarce. The present report describes a patient with symptomatic bilateral Killian-Jamieson diverticula. The patient had both diverticula excised and an esophagomyotomy performed. Following surgery, the patient's symptoms resolved and he recovered well. A literature review and discussion of the etiology, clinical presentation and radiographic findings of Killian-Jamieson diverticulum follow, as do recommendations for clinical management.

Key Words: *Diverticulum; Esophagus; Killian-Jamieson; Zenker's*

An outpouching from the lateral wall of the proximal cervical esophagus is defined as a Killian-Jamieson diverticulum. These diverticula protrude through a muscular gap in the anterolateral wall of the proximal esophagus, inferior to the cricopharyngeus muscle and superior-lateral to the longitudinal muscle of the esophagus (1). This gap was first described by Killian (2) as corresponding to the area where the recurrent laryngeal nerve enters the pharynx. This finding was later confirmed by Jamieson (3) and is now termed the Killian-Jamieson triangle (4).

Killian-Jamieson diverticula are rare forms of hypopharyngeal diverticula (5). They are distinct from the more commonly known Zenker's diverticulum. Killian-Jamieson diverticula are usually unilateral – only 25% are bilateral (6). Literature pertaining to Killian-Jamieson diverticula and its suggested management is scarce (1,5-7). The present case report describes a patient with symptomatic bilateral Killian-Jamieson diverticula. The etiology, clinical presentation, radiographic findings and surgical management of patients with Killian-Jamieson diverticula are also reviewed.

CASE PRESENTATION

A 69-year-old man complained of progressive dysphagia when eating solids; he also experienced nighttime coughing and hoarseness. The patient suffered from gastroesophageal reflux disease, with no history of weight loss. His medication included pantoprazole 40 mg twice a day and domperidone 10 mg four times a day. He was a nonsmoker and consumed approximately two glasses of wine per day. An examination of the head and neck was unremarkable. A contrast esophagram and contrast computed tomography (CT) scan of the chest and neck were obtained.

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Received for publication August 3, 2009. Accepted August 4, 2009

Un diverticule de Killian-Jamieson bilatéral : Rapport de cas et analyse bibliographique

Un diverticule de Killian-Jamieson est une ectasie sacculaire de la paroi latérale de l'œsophage cervical proximal. Ce diverticule est peu courant et distinct du diverticule de Zenker, mieux connu. Les publications au sujet de ce diverticule et de sa prise en charge sont rares. Le présent rapport décrit le cas d'un patient ayant un diverticule de Killian-Jamieson bilatéral symptomatique. Le patient a subi l'excision des deux diverticules et une œsophagomyotomie. Après l'opération, ses symptômes ont disparu, et le patient s'est bien rétabli. Une analyse bibliographique et un exposé de l'étiologie, de la présentation clinique et des observations radiographiques du diverticule de Killian-Jamieson suivent, de même que des recommandations de prise en charge clinique.

An axial CT scan of the neck (Figure 1) demonstrated two large cervical esophageal diverticula. These descended into the superior mediastinum bilaterally and were located just below the cricoid cartilage. There was heterogeneous material in both diverticula. After consultation with the patient, a transcutaneous diverticulectomy and esophagomyotomy were scheduled.

The diverticula were approached through an oblique incision along the anterior border of the left sternocleidomastoid muscle with the patient's head extended and slightly turned to the right. After dividing the omohyoid muscle, both diverticula were visualized. The diverticula were dissected to their base. An esophagomyotomy was then performed. With a bougie in the esophagus, a reloadable linear stapler (Proximate TL-30, Ethicon Inc, USA) was used to transect each diverticulum at its base. The wound was then closed in layers with placement of a closed suction drain. The patient was started on a clear fluid diet postoperative day 1 and advanced to a soft diet on postoperative day 3. The drain was removed on postoperative day 2. Two months after surgery, the patient was free of dysphagia, regurgitation and nighttime cough.

DISCUSSION

The pathogenesis of Killian-Jamieson diverticula is unknown. However, it is likely that Killian-Jamieson diverticula, in addition to Zenker's diverticula, are acquired given the advanced age distribution of patients with these hypopharyngeal diverticula (7). Tang et al (5) hypothesized that Killian-Jamieson diverticula are the result of a functional outflow obstruction in the esophagus in much the same way that a Zenker's diverticula is believed to result from a functional outflow obstruction in the pharynx. The circular muscle fibres of the proximal esophagus are believed to inappropriately constrict during the act of

Figure 1 Axial computed tomogram of the patient's neck. Bilateral diverticula are shown lateral to the esophagus and below the cricoid cartilage. The right diverticulum measures 4.4 cm × 2.8 cm and the left measures 3.5 cm × 2.5 cm. Heterogeneous material is seen in both diverticula, consistent with food debris. No cervical adenopathy is present

swallowing (5). This may create high intraluminal pressure, which is then transmitted to the weakened area within the Killian-Jamieson triangle. The pressure may be accentuated by the simultaneous closure of the cricopharyngeus muscle above the diverticulum. Esophagography has shown cricopharyngeus muscle closure in all patients with Killian-Jamieson diverticula (6). This also explains why overflow aspiration and aspiration pneumonia, which are seen in patients with Zenker's diverticula, do not occur in patients with Killian-Jamieson diverticula (6).

Dysphagia, cough and epigastric pain are the most common symptoms experienced by patients with Killian-Jamieson diverticula (6). However, it is unclear whether Killian-Jamieson diverticula alone cause these symptoms. A case series (6) of 16 patients with Killian-Jamieson diverticula found 11 with symptoms. However, eight of these patients had abnormal pharyngeal motility or an abnormal oral phase of swallowing, which may have contributed or even caused these symptoms. The fact that Zenker's diverticula are, on average, larger than Killian-Jamieson diverticula (6), and are located in the posterior pharynx, may explain why these diverticula cause symptoms without the associated abnormal oral or pharyngeal motility that is seen with Killian-Jamieson diverticula.

A barium esophagram can often establish the diagnosis of a pharyngeal diverticulum (1). A Zenker's diverticulum is seen in the posterior wall of the pharynx on lateral view (8), often with contrast retained within the diverticulum. A prominent cricopharyngeal bar is often observed. A Killian-Jamieson diverticulum is seen on the lateral wall of the pharyngoesophageal junction on anteroposterior view and below the cricopharyngeal muscle (8), with contrast possibly being retained (1). At times, it may be difficult to distinguish between a Zenker's diverticulum and a Killian-Jamieson diverticulum with a barium esophagram (7). This occurs especially when the diverticula are large and extend inferiorly (6). In such cases, an axial CT scan may be used to locate the origin of the diverticulum more precisely (7).

Only two reports regarding the treatment of Killian-Jamieson diverticula have been cited in the literature, both of which dealt with a unilateral diverticulum. The first was by Rogers et al (7), who approached the Killian-Jamieson diverticulum through a horizontal left neck incision. The diverticulum was then mobilized and transected with a surgical stapling device. No esophagomyotomy was performed. The second was by Tang et al (5), who performed a distal vertical diverticulotomy with a flexible endoscope. Using a needle-knife, the distal vertical diverticulotomy was performed approximately 10 mm vertically from the opening in the diverticulum. This resulted in a dissection of the circular esophageal muscle inferior to the diverticulum.

At the base of the Killian-Jamieson's diverticula, the recurrent laryngeal nerves enter the pharynx. Because of the close proximity of the inferior laryngeal nerves to the base of these diverticula, we approached the diverticula transcutaneously instead of endoscopically to avoid injury to these nerves in the present case. We also performed an esophagomyotomy in addition to a diverticulectomy to relieve the potential functional obstruction in the circular esophageal muscle inferior to the diverticula. The circular esophageal muscle inferior to the diverticula may contribute to or cause its formation.

CONCLUSION

Killian-Jamieson diverticula are rare and poorly understood hypopharyngeal diverticula. Even rarer are bilateral diverticula. These diverticula are unlikely to be differentiated from Zenker's diverticula based solely on their clinical presentations. Barium esophagography and a CT scan are used to make the diagnosis and differentiate between the two. We believe its pathophysiology is similar to Zenker's diverticula, which is to say that Killian-Jamieson diverticula are the result of a functional esophageal obstruction. The symptoms observed in these patients may be due to an underlying abnormal oral and or pharyngeal phase of swallowing. Until its pathophysiology is better understood, we recommend that an esophagomyotomy be part of its surgical treatment. In addition, we recommend that these diverticula be approached transcutaneously to prevent a recurrent laryngeal nerve injury. Studies using esophageal myometry may help shed light onto the pathophysiology of these diverticula. In addition, studies that follow patients' symptoms after different surgical treatments may help, not only to clarify its etiology but also tailor its surgical management.

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