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CASE REPORT

Acute intramucosal dissection in eosinophilic esophagitis

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Abstract

Acute intramucosal dissection of the esophagus (IED) is a rare complication of eosinophilic esophagitis (EoE). Only few of such IED cases have been described in the literature. We report the case of a 32-year-old man with a 4-months diagnosis of EoE who was referred to the Emergency Department complaining of dysphagia, epigastric pain and fever and who was diagnosed, after an urgent endoscopy, an IED. After careful evaluation and multidisciplinary assessment the patient was managed conservatively, with specific medical therapy—high-dose proton pump inhibitors, swallowed steroid, broad-spectrum antibiotic—and, after a period of absolute fasting, a diet regimen based on "six food elimination diet" with a stepwise increase of food consistency. The patient experienced a rapid and complete relief of symptoms, paralleled by a progressive healing of IED with no recurrence over a 6-month follow-up period. In EoE patients with a high clinical suspicion of an acute IED, we suggest an early execution of chest CT and a contrast esophagography, avoiding potentially dangerous endoscopic procedures in the acute phase that can contribute to enlargement of the dissection, or progression to perforation. Once the diagnosis of IED is confirmed, even in the presence of a contained perforation, a conservative treatment with a multidisciplinary management should always be considered.

Keywords Dysphagia · Eosinophilic esophagitis · Endoscopy · Esophageal dissection · Contrast esophagography

Introduction

Eosinophilic esophagitis (EoE) is a chronic inflammatory disease of the esophagus increasingly been diagnosed in patients presenting with a history of recurrent dysphagia [1]. The etiology of the disease is a local, immune-mediated response associated with abnormalities of Th2-dependent immunity, which can be considered as a particular kind of food allergy [2, 3]. Indeed, EoE is typically associated with a history of environmental and/or food hypersensitivity, and disease activity is usually responsive to the elimination of food antigens [4].

From a clinical standpoint, EoE is characterized by symptoms of food impaction and dysphagia in adults while Gastro-Esophageal Reflux Disease (GERD) symptoms are common in children. A correct diagnosis is established by upper endoscopy with esophageal biopsies. At endoscopy, findings include edema and/or decreased vascularity of the mucosal surface (also referred as loss of vascular pattern), mucosal fragility (or crêpe paper mucosa), longitudinal furrows, transient or fixed corrugated rings (esophageal trachealization),

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white nodule- or plaque-like exudates, strictures of variable length and a narrow caliber esophagus [5]. Histological hallmark is an eosinophil-predominant inflammation [> 15 eosinophils/HPF] on esophageal biopsy. In uncomplicated cases, treatment includes proton pump inhibitors (PPI), dietary approaches based upon avoiding exposure to food allergens and swallowed topical corticosteroids [6, 7].

In some cases esophageal food impaction can be the initial presentation of the disease. Endoscopic procedures to relieve food impaction may lead to complications such as mucosal tears or esophageal perforation and, even if rare, spontaneous intramural esophageal dissection (IED) has also been reported as a primary manifestation of EoE.

Here we report a case of EoE complicated by IED, treated conservatively, with the aim of providing useful tips for management and of identifying critical gaps in knowledge.

Case report

A 32-year-old man presented to the Emergency Room complaining a 2-day history of dysphagia associated with epigastric pain and fever (up to 39 °C). Despite a diagnosis of EoE being made 4 months earlier, the patient was not taking any medication, except for Esomeprazole (40 mg/daily), and he was not sticking to any specific diet.

Since childhood, the patient had been diagnosed with allergic rhinitis, and had reported GERD symptoms associated with recurrent dysphagia and episodes of food impaction. An endoscopy performed 4 months in advance had showed the characteristic macroscopic features of eosinophilic esophagitis ("esophageal trachealization") (Fig. 1) and microscopic examination had showed marked eosinophilic infiltration (Fig. 2).

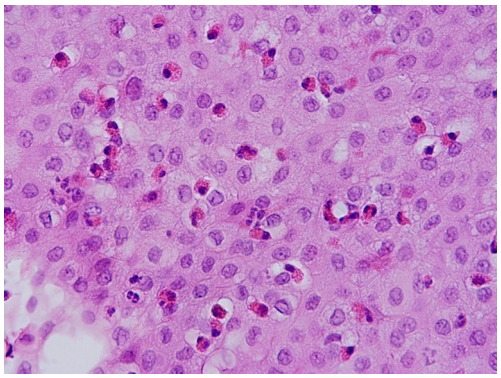

Fig. 2 Histopathological examination highlighting a dense eosinophilic infiltrate with intraepithelial eosinophils > 30/HPF

At presentation the patient was febrile (TC 37.8 °C), while other vital signs were within the normal range and physical examination was unremarkable. Laboratory tests documented a high white blood cell count (12.250/mm^3, neutrophils 84%) without peripheral hypereosinophilia, an elevated C-reactive protein (114.2 mg/l) and hyperfibrinogemia (600 mg/dl). Chest X-ray, direct abdomen X-ray and abdomen ultrasound did not show any pathological findings.

The patient was immediately referred for an urgent endoscopy. The procedure confirmed the esophageal trachealization, with corrugated rings, and a crepe-paper-like mucosa with strictures of variable length (Fig. 3). Soon after endoscopy, patient's epigastric pain worsened and extended as a retrosternal chest pain. A thoracic contrast CT scan showed a marked fluid distension of the esophagus with air-fluid levels (axial dimensions max 17 mm) and the presence of small air bubbles displaced along and apparently immediately out of the wall in the middle and lower esophageal tract (Fig. 4a, b). An esophagogram with water-soluble contrast

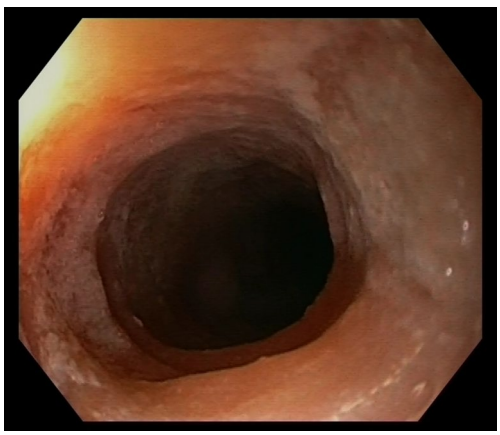

Fig. 1 Endoscopy performed 4 months before admission pointing out the "esophageal trachealization"

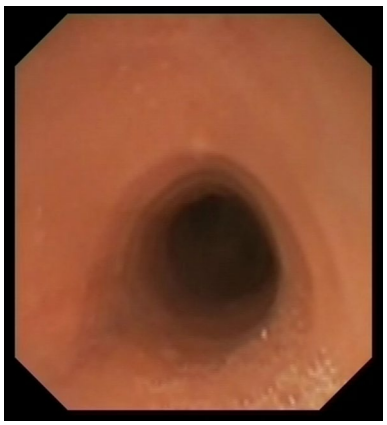

Fig. 3 Urgent endoscopy performed at admission showing the "Esophageal trachealization", with corrugated rings, and a crepe-paper-like mucosa with strictures of variable length

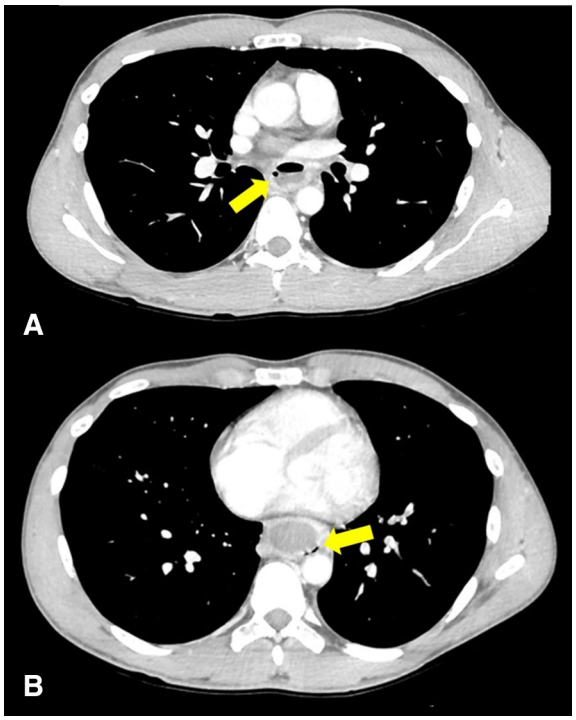

Fig. 4 Thoracic contrast CT scan. **a** Marked fluid distension of the esophagus with air-fluid levels (arrow). **b** Small air bubbles displaced along and apparently immediately external to the wall in the middle and lower esophageal tract (arrow)

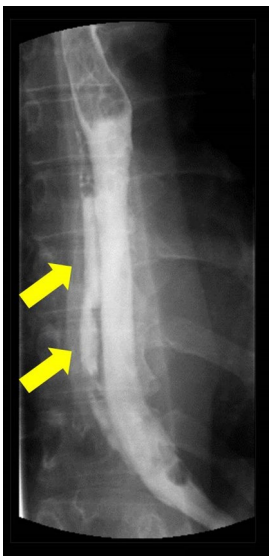

Fig. 5 Water-soluble contrast esophagogram shows a double-barreled esophagus. The retention of oral contrast in the false lumen (arrows), posterior of the true lumen, is evident. No extraluminal leak is present

documented an intramural dissection of the esophageal wall (Fig. 5), with a mucosal tear in the mid tract and intramural extension of a false lumen up to the gastric junction; there was no evidence of contrast extravasation.

After a careful and comprehensive evaluation, a multidisciplinary team—including an internist, a gastroenterologist, a thoracic surgeon, a radiologist and a nutritionist—concluded that the management should have been conservative at first. Thus, the patient initiated an absolute fasting for both solids and liquids and started total parenteral nutrition. Under close clinical monitoring he was treated with high-dose esomeprazole (80 mg/die), swallowed fluticasone propionate four times/daily and broad-spectrum antibiotic (Ceftriaxone, Metronidazole, and Fluconazole). The patient experienced a rapid relief of symptoms, with no ensuing complications. On day 12 since the initiation of treatment, the patient was allowed to resume eating an empirically prepared "six food elimination diet" (no cow's milk protein, wheat, egg, soy, peanut/tree nuts, fish, and seafood), with progressive increase of consistency. The patient was discharged in improved clinical conditions 15 days after initial admission on high-dose PPI and swallowed topical corticosteroids. An esophagogram with water-soluble contrast repeated 1 month after discharge documented a reduction of the "double lumen" previously present (Fig. 6a). No false lumen was evident anymore after 6 months of follow-up (Fig. 6b).

Discussion

EoE is a chronic condition that usually begins in childhood, but in some patients it may become clinically apparent in adulthood (usually in their 20 s or 30 s) when dysphagia occurs. There is an absolute male gender prevalence and a strong association with allergic conditions such as food allergies, allergic rhinitis, asthma, and atopic dermatitis.

Swallowing difficulties are due to the remodeling of the esophagus, resulting in stricture formation and functional abnormalities [8]. This becomes particularly evident when the diagnosis is delayed, with persistent symptoms and inflammation [9, 10]. In the illustrated case, the patient had been misdiagnosed despite a suggestive symptomatology since childhood. The consequent developing of esophageal trachealization with extreme mucosal fragility, put him at high risk of IED or perforation.

IED is an uncommon but well-defined clinical entity, consisting in the separation of mucosa and/or submucosa from deeper muscular layers with consequent development of a false lumen [11, 12]. Risk factors and pathophysiologic mechanisms for this entity are now fairly well understood: the most common causes of IED are iatrogenic, which include endoscopic procedures (routine endoscopy or endoscopic manipulation with air insufflation) [13]. In other cases IED is associated with mucosal trauma during eating (foreign body ingestion or food impaction). Risk is more elevated in inflammatory conditions, such as EoE, due to an important fragility of the esophageal mucosa.

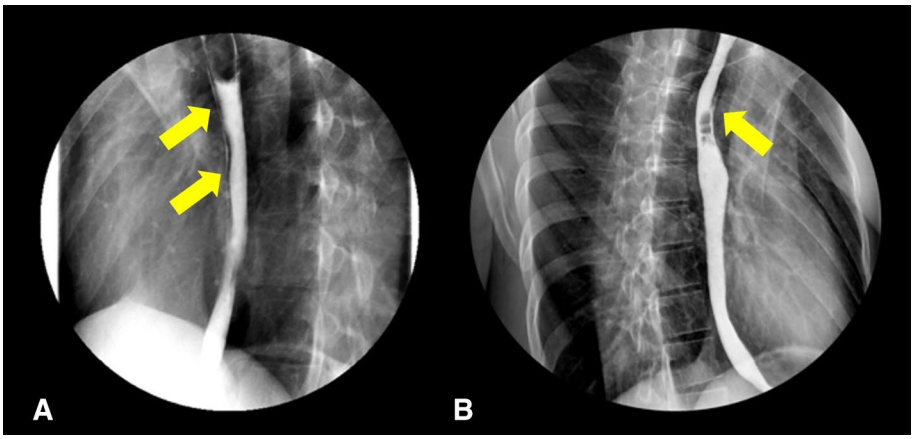

Fig. 6 **a** Water-soluble contrast esophagram performed 1 month later shows retention of oral contrast in the persistent, but thinner, false lumen (arrows on the right anterior of the true lumen in subcarinal tract of esophagus). **b** Water-soluble contrast esophagram performed 6 months later shows the true lumen filled with oral contrast material; no false lumen is evident

In recent years, few cases of spontaneous IED complicating EoE have been described in the literature, suggesting EoE represents a major risk factor for IED and perforation [14–17]. The mechanism underlying the development of dissection is the esophageal dismotility with frequent bolus impaction, that along with mucosal inflammation contribute to the risk of laceration of the esophageal wall.

An urgent upper gastrointestinal endoscopy has always been performed in the reported cases. The patient managed by Liguori et al. developed an acute chest pain soon after the procedure, and they suppose that the dissection may have been worsened by endoscopy. In the case here described, patient's symptoms at admission could be related to a mucosal tear already present, but the pain modified and worsened after the endoscopy, probably as a consequence of an enlargement of the dissection caused by the procedure.

Endoscopy is not the examination of choice to show the mucosal tear, due to the fact that during procedure the flap could be just exposed to the esophageal wall. Contrast esophagogram is the most efficient examination not only to confirm the diagnosis (showing the typical "double-barreled" esophagus) but also to assess the degree of dissection and, eventually, the presence of perforation by determining whether extraluminal leakage is present or not: in fact, esophageal perforation can range in severity and can be classified as extraluminal air leakage only, contained perforation, free mediastinal leakage, free leakage with extension into the pleural space [18]. Conservative management is indicated when perforation is contained and there is no contrast extravasation; conversely, in the suspicion of a severe perforation, management should be aggressive even considering surgery. IED has traditionally been considered not being complicated by perforation, but few cases of IED with subsequent progression to perforation are described in the literature [19]. Symptoms of IED are typically dysphagia and/or odynophagia, chest or back pain, and nausea. In the case of our patient, in addition to these symptoms he presented with clinical findings—fever, leukocytosis, increased CRP—suggestive of an esophageal perforation. However, at physical examination there was no periclavicular subcutaneous emphysema, no significant pneumomediastinum at the CT scan and the esophagogram did not show any contrast extravasation. As the patient experienced only an extraluminal air leakage—the mildest form of esophageal perforation—he was managed conservatively, with complete relief of symptoms, quick recovery and healing of the dissected mucosal flap.

Currently, guidelines on diagnosis and overall treatment of eosinophilic esophagitis do not provide any suggestions about the management of complicated cases, such as in case of IED development. In conclusion, we propose that in patients with an established diagnosis or an highly clinical suspicion of EoE (according to the allergic phenotype, the history of recurrent dysphagia, the male gender etc.) presenting with symptoms suggestive for IED or perforation (sudden onset of severe retrosternal pain, odynophagia and dysphagia), the preferred approach should consider the prompt execution of a chest CT scan and of a contrast esophagogram, avoiding potentially dangerous endoscopic procedures in the acute phase. Once a diagnosis of IED is established, even in the presence of a contained perforation, a conservative treatment should always be preferred. The treatment should be based on steroids to be swallowed and high-dose PPI, along with an adequate period of fasting followed by the progressive introduction of an elimination diet with a stepwise increase of food consistency. To this end, the importance of a multidisciplinary management cannot be overemphasized. Therefore, to improve recommendations and guidelines, future studies on EoE should also consider the correct management of its main complications.

Compliance with ethical standards

Conflict of interest The authors declare that they have no conflict of interest.

Human/animal rights All procedures followed have been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments.

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