The incidence of esophageal perforations during balloon dilation is 0–14% (1–3). An esophageal perforation is classified into three types: a type I—intramural perforation; a type II—transmural perforation; and a type III—transmural perforation with mediastinal leakage (4). Fasting, parenteral alimentation, and antibiotics are generally used to treat types I and II esophageal perforations. However, a type III esophageal perforation showing progressive clinical deterioration needs to be treated surgically (4, 5). There are no reports of a successful conservative treatment for a type III esophageal rupture after esophageal balloon dilation.

We report a case of a successful conservative, non-surgical treatment for a transmural perforation with mediastinal leakage after a balloon dilation.

Case Report

A 43-year-old man was admitted complaining of intermittent swallowing difficulties. The esophagography revealed severe stenosis at the esophagogastric anastomotic site. Esophagography after balloon dilatation showed a transmural perforation with mediastinal leakage. The patient was treated conservatively for one week at which time the esophagography showed no further leakage at the anastomotic site and the good passage of barium. A 2-year follow-up chest computed tomography (CT) showed good patency of the esophageal lumen and the marked resorption of barium in the mediastinum.

Index words: Esophagus
Postoperative stricture
Interventional procedures
Perforation
Pharynx topical anesthesia was routinely performed using a lidocaine gel before the procedure. No sedatives or general anesthetic were used. The patient was then asked to swallow a small amount (10 mL) of barium in order to opacity the narrowed esophageal lumen. A 0.035-inch angled exchange guide wire (Radiofocus wire; Terumo, Tokyo, Japan) was then inserted through the patient’s mouth, across the stricture, and into the distal part of the stomach under fluoroscopic guidance. A deflated balloon catheter (20 mm in diameter and 3 cm long; Medi-tech/Boston Scientific, Watertown, Mass) was passed over the guide wire to span the stricture. The balloon catheter was passed through the stricture, and inflated until the hourglass deformity had disappeared. This inflation was repeated twice. After the procedure, an esophagography revealed the extravasation of barium into the mediastinum and peritoneum, representing a type III esophageal perforation [Fig. 2].

The patient was admitted to hospital and treated conservatively by fasting, antibiotics administration, and parenteral alimentation for seven days, after which the follow-up esophagography revealed the patency of the anastomotic site and no barium leakage into the mediastinum [Fig. 3]. The patient’s diet was unrestricted after discharge. A two-year follow-up chest CT showed good patency of the anastomotic site lumen and a marked resorption of the barium at the mediastinum.

Discussion

Stricture formation that impedes gastric emptying is a relatively common complication after gastric surgery, and involves anastomosis creating or pyloroplasty. The duration of stricture formation after a gastrectomy varies from 13 days to 10 years (mean: 14 months).
Treatment of the stenosis with a fluoroscopically guided balloon dilation avoids the need for further surgery (6).

An esophageal perforation can be induced by an esophageal procedure, such as a bougienage or balloon dilation, or it can result from a spontaneous esophageal rupture, as in Boerhaave’s syndrome (5). In the case of balloon dilation, the corrosive strictures have a higher rate of esophageal perforation than a postoperative stricture. In corrosive stricture patients, extra caution must be taken during balloon dilation in order to avoid an esophageal perforation (3).

An esophageal perforation may be classified into three types (4). Type I involves an intramural esophageal rupture, which is defined as a natural drainage of leaked barium back into the esophageal lumen. Type II is a well-contained transmural rupture, which is defined as the localization of leaked barium without any spillage into the mediastinum. Type III is a transmural rupture with mediastinal spillage, which is defined as the free spillage of leaked barium into the mediastinum, pleura or peritoneum. Our patient had a type III esophageal perforation.

The treatment of an esophageal rupture normally involves the early surgical closure with or without reinforcement (5). Sato et al. reported a spontaneous esophageal rupture treated successfully by conservative therapy (7), and Heindel et al. reported the successful treatment of a ruptured anastomotic esophageal stricture after a bougienage with a Dacron-covered nitinol stent (8). Tsunoda et al. also reported good results using a covered metallic stent for the treatment of a spontaneous rupture of the esophagus (9). Skinner et al. emphasized that early diagnosis of esophageal perforation is critical (5). They suggested the selective use of conservative treatment in the following cases: [a] patients who are clinically stable at the time of presentation and remain so; [b] patients who had taken nothing by mouth prior to the esophageal instrumentation or balloon dilation, and in whom the rupture is detected before any major contamination, or patients with a perforation diagnosed after such a long delay that they demonstrate tolerance of the perforation without the need for surgery; and [c] patients with esophageal disruptions that are well-contained within the mediastinum or a pleural loculus (5). Types I and II esophageal perforations are generally treated conservatively by fasting, antibiotics administration, and parenteral alimentation. Type III esophageal perforations need to be treated surgically particularly if the patient shows a gradually deteriorating clinical status (4, 5). In our case, the esophageal perforation was type III, and the barium contrast medium spilled out of the perforation into the mediastinum and peritoneum but was localized as a result of postoperative adhesion. Conservative therapy was used in our case because the patient did not show a gradually deteriorating clinical status or barium localization. The patient experienced a good recovery seven days after the procedure and could swallow all types of foods during the three-year follow-up.

In conclusion, type III esophageal perforation after a balloon dilation in cases of a postoperative anastomotic site stricture must be treated with caution. It is proposed that conservative treatment, such as fasting, parenteral alimentation, and intravenous antibiotics are a good alternative to surgery when the perforation shows loculation in the mediastinum or peritoneum, without a gradual deterioration in the patient’s clinical status.

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