Case Report

Severe Pneumoperitoneum after GI Endoscopy in an Intensive Care Patient with an Immature Percutaneous Endoscopic Gastrostomy Tract

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Abstract

Percutaneous endoscopic gastrostomy (PEG) is considered a safe technique for providing enteral access and nutrition support in patients incapable of oral feeding. The fixation between the stomach wall and abdominal wall requires time and is essential for the formation of the PEG tract. However, there is no evidence in the literature that endoscopy should not be attempted in patients with an immature PEG tract. Here, we report a complication of pneumoperitoneum and peritonitis in a patient with a recently performed PEG as a result of upper gastrointestinal endoscopy.

ABBREVIATIONS

PEG: Percutaneous Endoscopic Gastrostomy

INTRODUCTION

During the course of their disease, many neurological patients will become incapable of oral feeding. This situation makes them liable to malnutrition, weight loss and dehydration. In these patients, percutaneous endoscopic gastrostomy (PEG), a technique introduced by Gauderer and Ponsky in 1980 [1], can be helpful by providing enteral access and long term nutritional support. Although it is considered a safe technique, major complications may still occur. We herein present the rare case of a patient with a recently performed percutaneous endoscopic gastrostomy who developed tension pneumoperitoneum and peritonitis as a result of endoscopy for the investigation of upper GI bleeding.

CASE PRESENTATION

We present the case of a 55 year old male with anoxic encephalopathy due to cardiac arrest under mechanical ventilation and nutrition support through nasogastric tube and a long hospitalization in the Intensive Care Unit. The patient underwent percutaneous endoscopic gastrostomy (PONSKY DELUXE “PULL” PEGKIT) since he became incapable of oral feeding for more than four weeks. The gastrostomy procedure was performed with the patient fasted and normal coagulation tests and platelet count. No procedural complications occurred, the PEG tube was left open for drainage of bowel air/decompression and the patient was transferred to the Hospital’s Neurologic Department. Forty eight hours after PEG tube placement, the patient presented with hemodynamic instability and melena. Upper GI endoscopy was ordered to identify the bleeding site and give therapeutic options if necessary. Endoscopy showed gastric content with blood and large clots covering the stomach’s anterior wall, and extended effort was performed to identify a bleeding site under the clots. Unable to determine the cause of bleeding, the outer bumper was loosened and the PEG tube was pushed towards the stomach, allowing the visualization of the gastric wall and stoma under the internal bumper. No active bleeding or ulcer was identified in the esophagus, stomach and duodenum, the bumpers were tightened again and the endoscope was removed. After the endoscopy, which lasted approximately 20 minutes, it was immediately observed that the patient showed massive abdominal distension and that the external bumper was displaced from its original position on the PEG tube (originally: on the 6-cm mark,
afterwards: on the 12-cm mark, and close monitoring of the patient was ordered. Twenty-four hours later, the patient showed signs of hemodynamic collapse, oliguria, metabolic acidosis and increased lactate. An abdominal computed tomography scan was requested and massive pneumoperitoneum was detected (Figure 1). Due to the deterioration of the patient’s clinical condition, an exploratory laparotomy was ordered, which revealed associated signs of peritonitis, that the stomach had been perforated and that the PEG tube had been displaced from the stomach and had been placed into the peritoneal cavity. After surgical restoration of the stomach wall, the patient was transferred to the Intensive Care Unit but he succumbed 3 days later as a result of multiple organ failure syndromes.

**DISCUSSION**

During PEG tube placement, a small amount of air insufflated to distend the stomach, enters the peritoneal cavity, resulting in non-significant pneumoperitoneum, as the PEG tract is immature and the stomach wall is not fixated to the abdominal wall yet. This is a common benign condition with rates up to 50% [2], but its presence may also indicate iatrogenic injury [3] related to high mortality rates [4] especially in significant pneumoperitoneum with associated signs of peritonitis. To allow PEG tract maturation and scar tissue formation, the PEG tube’s internal and external bumpers must be kept tight for at least 72 hours [5] to prevent the separation of the stomach and abdominal wall. PEG tract maturation is usually completed within a 14 to 30 day period [6,7] but a longer period is required if the wound healing mechanism is affected (e.g. patients under treatment with high-dose steroids or immunosuppressive agents, patients with diabetes mellitus, peripheral artery disease, infection or malnourished patients). The main causes of peritonitis in patients with percutaneous endoscopic gastrostomy are related to an immature PEG tract and include removal or displacement of the PEG tube, leakage around the PEG tube, and iatrogenic perforation of the gut during the procedure [8]. Bleeding after PEG tube placement is an uncommon complication with rates ranging around 2, 5% and usually caused by placement and replacement-related hemorrhage (i.e. gastric pressure ulcers or puncture of a gastric wall vessel), reflux esophagitis and from already existing peptic ulcer disease [8]. Endoscopy can assist in identifying if bleeding is associated with PEG tube placement or other causes and provide therapeutic options if necessary. There is no evidence in the literature that endoscopy should not be attempted in patients with a recently performed percutaneous endoscopic gastrostomy.

In the case presented above, poor PEG tract maturation allowed a considerable amount of air during and after endoscopy to enter the peritoneal cavity, resulting in massive pneumoperitoneum. It became obvious that despite our efforts external bumper moved repeatedly from the 6-cm mark to the 12-cm mark since massive pneumoperitoneum displaced the anterior abdominal wall ventrally and the stomach wall dorsally preventing bumpers to be tightened again to the optimal position (Figure 2). Stomach and abdominal wall were later separated, the PEG tube was displaced from the stomach into the peritoneal cavity, and leakage from the PEG puncture site of the stomach occurred, leading to peritonitis.

In the absence of clinical guidelines, we suggest the following. Patients who require endoscopy within a short period after PEG tube placement should be evaluated if they could be managed with a non-invasive approach. Comorbid situations and medical treatment which may affect wound healing and scar tissue formation should be seriously taken into consideration before ordering endoscopy. If endoscopy is required, air insufflations should be used with caution and endoscopy time should be limited. The endoscopist should be aware of alarming signs such as inadequate insufflations during endoscopy, abdominal distention and displacement of the outer bumper after endoscopy, signs which are highly indicative of tension pneumoperitoneum. More research is needed to determine if upper GI endoscopy is safe in patients with recently performed endoscopic gastrostomy.
REFERENCES


8. Faias S, Buck G, Delegge M. Peritonitis after percutaneous endoscopic gastrostomy and jejunostomy: where there is smoke, there may not be fire. Endoscopy. 2006; 38: 745-748.