



Clinical Case Study

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SUCCESSFUL CONSERVATIVE TREATMENT OF AN ELDERLY PATIENT WITH AN ERCP-RELATED DUODENAL PERFORATION ASSOCIATED WITH WIDESPREAD SUBCUTANEOUS EMPHYSEMA

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Endoscopic retrograde cholangiopancreatography (ERCP) has become a widely used and important technique for the diagnosis and management of biliary and pancreatic disorders. However, ERCP carries a small risk of serious complications, such as pancreatitis (3.5%–3.8%), bleeding (0.9%–1.3%), perforation (0.1%–1.1%), and cholangitis (1.0%–5.0%) (ASGE Standards of Practice Committee, Anderson, et al., 2012; Christensen, Matzen, Schulze, & Rosenberg, 2004). One of the most feared complications is perforation. To date, the primary treatment of duodenal perforation has been surgery. As the endoscopic technique has developed, there have been reported cases of ERCP-related duodenal perforation successfully treated with endoscopic closure (Donatelli et al., 2013; Lee et al., 2010; Nakagawa et al., 2010; Yu, Hong, & Hong, 2014). However, no case concerning the conservative treatment of an older patient with widespread emphysema due to ERCP-related perforation has been reported. We report the case of an elderly female patient with a duodenal perforation caused by duodenoscopy during ERCP who was successfully treated by endoscopic closure and subsequent conservative treatment.

Case Report

An 81-year-old female patient was admitted to our hospital for abdominal pain of 2-week duration. The pain was caused by swelling in the upper abdominal region, and the patient was experiencing chills and fever. The patient had a history of hypertension. A physical examination on admission revealed that she was pale, but was otherwise unremarkable. A computed tomographic (CT) scan of the abdomen revealed “common duct stones (1.1×1.1 cm).” Laboratory findings indicated a hemoglobin level of 83,000 mg/L (reference range = 115,000–150,000 mg/L), with no other obvious abnormal findings. On the basis of these findings, we arranged ERCP for the patient due to the

diagnosis of common duct stones. After the insertion of a duodenoscope and removal of the stones, a perforation occurred in the lateral wall of the descending duodenum. Surgery was not possible due to the patient’s age and the presence of hypertension. Therefore, we performed an endoscopic repair of this perforation with endoclips (Figure 1). Subsequently, we arranged for a nurse to monitor the patient’s consciousness level, temperature, pulse, and blood pressure. The presence of subcutaneous emphysema in the patient was noted. In addition, nurses oversaw the recovery of the patient to ensure a fast recovery.

After the endoscopic closure, subcutaneous emphysema was observed in the patient’s face, neck, and thorax. CT scan revealed pneumothorax, pneumomediastinum, pneumoperitoneum, pneumoretroperitoneum, and subcutaneous emphysema (Figure 2). Moreover, the patient was suffering from other diseases, such as pancreatitis and pneumonia, which were ascertained by CT findings (Figure 3). In consideration of the advanced age of the patient and the presence of hypertension, she was administered conservative treatment, including suctioning the remaining gas from the subcutaneous emphysema, nasogastric suction, nasobiliary drainage, antibiotic treatment, and intravenous fluids. Because the patient’s status was life-threatening, she underwent two emergency treatments, after which she had a successful recovery. After 1 week of conservative treatment, the patient’s condition had improved, and on the CT scan, no obvious subcutaneous emphysema in the thorax and abdomen was observed (Figure 4).

Discussion

Although the rate of duodenal perforation during ERCP is low in the literature, the results of this complication are severe and may be life-threatening. For a duodenal perforation, early recognition and treatment may minimize morbidity and mortality. Immediate

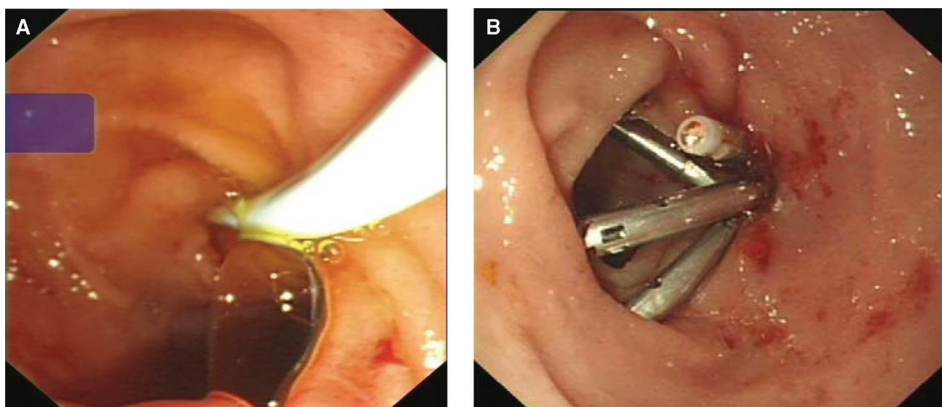


FIGURE 1. Endoscopic duodenal perforation (A) and endoscopic closure of the perforation with endoclips (B).

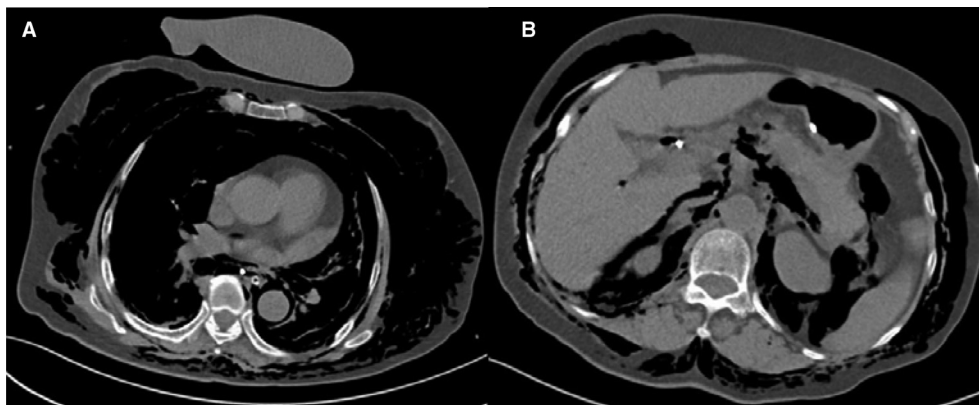


FIGURE 2. Pneumothorax, pneumomediastinum, pneumoperitoneum, pneumoretroperitoneum, and subcutaneous emphysema can be observed (A, B).

surgery is commonly appropriate for a duodenal perforation. However, case reports have recently indicated that an ERCP-related duodenal perforation can be successfully treated with endoscopic closure (Donatelli et al., 2013; Lee et al., 2010; Nakagawa et al., 2010; Yu et al., 2014).

At present, guidelines or a consensus for duodenal perforation management is lacking. Perforation management depends on the type of perforation, radiological findings, the severity of the injury, patient status, and the doctor's technique. Types of perforation are delimited, and suggestions regarding the treatment have been recommended for each type (Enns et al., 2002; Stapfer et al., 2000). The endoscopic technique makes conservative treatment of this disease possible. Even a patient who required previous surgery for a large duodenal perforation can be treated with endoloops and endoclips (Nakagawa et al., 2010). Instead of endoloops and endoclips, additional fibrin glue injection can also be used for perforation (Yu et al., 2014). The older patient in our study with widespread subcutaneous emphysema due to a duodenal perforation was treated successfully.

Considering the unfavorable factors for surgery in patients such as older adults, those who are weak, and patients with other diseases (i.e. a long history of hypertension), conservative treatment may be the preferred alternative. In our patient, endoclips were used under endoscopic guidance as soon as the duodenal perforation occurred. Subsequently, we closely monitored the patient's level of consciousness, temperature, pulse, and blood pressure, as well as whether the subcutaneous emphysema was present. In this case, pneumothorax, pneumomediastinum, pneumoperitoneum, pneumoretroperitoneum, and subcutaneous emphysema developed after endoscopic closure. However, widespread subcutaneous emphysema, which increased the difficulty of recovery, was detected early.

We searched the literature to identify cases of pneumothorax due to duodenal perforation that were successfully treated conservatively (Borgharia et al., 2011; Schepers & van Buuren, 2012). Unfortunately, the patient also suffered from complications due to pancreatitis. After consideration of the many harmful factors and complications of surgery, the patient was successfully treated conservatively. Nasogastric suction and nasobiliary drainage played a vital role in her

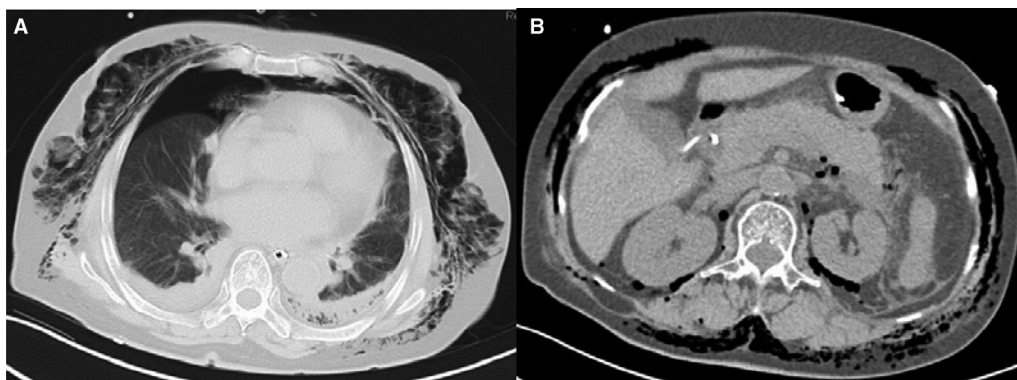


FIGURE 3. The images depict pneumonia (A) and pancreatitis (B).

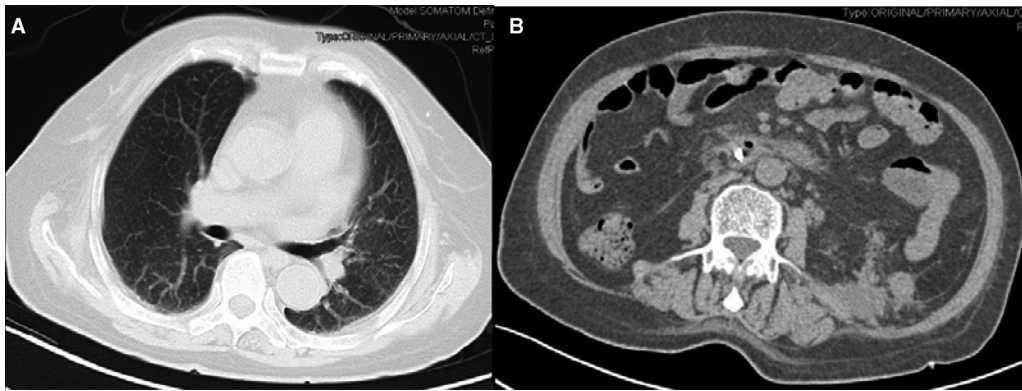


FIGURE 4. After conservative treatment, no obvious subcutaneous emphysema can be observed in the thorax (A) or abdomen (B).

successful treatment because these measures helped decrease the possibility of transporting digestive enzymes and digestive residue into the abdominal cavity and prevented severe infection.

As previously discussed, some patients with poor health status and complication-related ERCP can be treated conservatively. In this case, we prevented abdominal infection, which was pivotal in the success of the treatment. Moreover, suction of the widespread subcutaneous emphysema was beneficial in eliminating the fluid and allowed it to be absorbed. In this case, there were no signs of peritonitis after endoscopic closure, which may be a beneficial factor for later conservative treatment.

Conclusion

If a duodenal perforation occurs during ERCP, the patient is to be closely observed by doctors and nurses. At the same time, the presence of a pneumothorax and subcutaneous emphysema should be monitored. Moreover, if the patient experiences pain, the presence of peritonitis or complicated pancreatitis should be evaluated. Both CT findings and laboratory tests are helpful for the diagnosis and assessment of treatment results. For a duodenal perforation, in addition to an endoscopic closure, nasogastric suction, nasobiliary drainage, antibiotic treatment, and intravenous fluids can be used. If subcutaneous emphysema is obvious, suction can assist in the absorption of the remainder of the fluid.

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