

Endoscopic necrosectomy through the major duodenal papilla under fluoroscopy imaging

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In the last twenty years we have observed development of minimally invasive techniques of treatment of pancreatic necrosis [1, 2]. Those methods include procedures handled with the use of an endoscope, laparoscope or nephroscope, enabling a transperitoneal, retroperitoneal, transmural or transpapillary approach to necrotic collection [1, 2]. The choice of access to the necrosis depends on its location and spread.

A meta-analysis of 8 studies revealed that in 286 patients with infected pancreatic necrosis, percutaneous drainage, being the only way of access to the necrosis, was efficient in 44% of patients [3]. The average rates of complications and mortality related to treatment were respectively 28% and 20% [3]. The next meta-analysis of 11 studies involving 384 patients revealed that in over half of them percutaneous drainage was an efficient method of treatment [4].

In minimally invasive techniques of treatment of walled-off pancreatic necrosis (WOPN) by a retroperitoneal approach, an inflexible nephroscope or flexible endoscope is inserted into the cavity of the necrosis, and then necrotic tissues can be removed by different endoscopic instruments [5, 6]. The desired effect of treatment by a minimally invasive retroperitoneal approach was achieved in 75–93% of patients [5–11]. Complications were reported in 24–88% of patients and mortality in 0–25% of them [5–11].

Transmural endoscopic drainage of pancreatic necrosis is based on the removal of necrotic content through a stoma formed between the lumen of the gastrointestinal tract and the cavity of the necrotic collection [12]. It is possible to take advantage of transpapillary drainage in treatment of pancreatic necrosis when the main pancreatic duct is damaged [13]. Patients without clinical improvement despite applied endoscopic drainage require necrosectomy. Endoscopic treatment of WOPN is efficient in 81–91% of patients. Complications were observed in 14–26% of patients [14–17].

Laparoscopy is found to be the next technique of pancreatic necrosis treatment consisting in access to the necrosis by a transperitoneal approach. It is said to be the least commonly applied method of minimally invasive WOPN treatment and also the least described in the literature. Successful treatment of pancreatic necrosis by laparoscopic techniques was reported in 74–90% of patients with a complication rate of 13–48% and mortality of 0–11% [18–21].

Direct comparison of above-mentioned results is hard not only due to the different size and variety of patient groups, but particularly due to differences between techniques of treatment and aggressiveness of used therapy. The period of observation also differs.

The choice of WOPN treatment method should depend on the experience of the medical center.

In infected walled-off pancreatic necrosis a step-up approach should be the first type of therapeutic procedure. This strategy can be applied with different ways of access to the cavity of the necrosis. Expansion of the access to the necrosis creates better drainage conditions.

Herein, we introduce a description of successful treatment of a patient with WOPN using minimally invasive techniques. In the applied treatment two ways of access to the cavity of the necrosis were used. First the endoscopic transmural drainage was made, since the distance between the lumen of the gastrointestinal tract and the cavity of the necrosis did not exceed 1 cm on endoscopic ultrasonography. Thereafter endoscopic transpapillary drainage was performed, because necrotic collection had communicated with the main pancreatic duct.

According to the first published scientific reports concerning endoscopic drainage of walled-off pancreatic necrosis, a small fistula (10–12 mm) between the lumen of the gastrointestinal tract and a cavity of the necrosis used to be made [16, 22]. With the spread of this method the diameter of the fistula was widened to 2 cm [23, 24]. Dilatation of the cystostomy up to 20 mm enabled fiberoscope entrance to the cavity of the necrosis and performance of endoscopic necrosectomy [23, 24]. In the described case the endoscopic necrosectomy was performed without the necessity of insertion of the fiberoscope into the cavity of the necrosis. In our study necrotic tissues were re-

moved through the major duodenal papilla using a Dormia basket and under fluoroscopy imaging, which gave beneficial clinical effects.

A 65-year-old woman after acute necrotizing gallstone-induced pancreatitis was admitted to our department in order to begin endoscopic treatment of infected WOPN in May 2013. At admission the patient suffered from abdominal pain, fever and shivers lasting for 2 weeks. Laboratory blood tests indicated elevated levels of amylase, lipase and markers of inflammation. Contrast-enhanced computed tomography (CECT) of the abdomen showed walled-off collection (202 × 130 × 240 mm) with tissue fragments, extending down the abdomen and drawing aside surrounding organs (Figure 1). After being explained the possible treatment complications and forecasted time of hospitalization, the patient expressed consciously her acceptance of endoscopic treatment of the WOPN. During hospitalization the fistula between the posterior wall of the stomach and the collection of the necrosis was made under endoscopic ultrasonography, resulting in an outflow of necrotic content. Using a high-pressure balloon the fistula was widened to a diameter of 20 mm. Afterwards through the stoma a double pigtail 8.5-Fr stent and a 8-Fr nasocystic drain were inserted (Figure 2) in order to irrigate the collection (200 ml saline solution every 4 h). Based on the results of a culture of the necrotic content the patient received antibiotic therapy – piperacillin with tazobactam (4 g + 0.5 g) intravenously every 8 h for 32 days. After the first 12 days of active transmural drainage, endoscopic retrograde pancreatography was

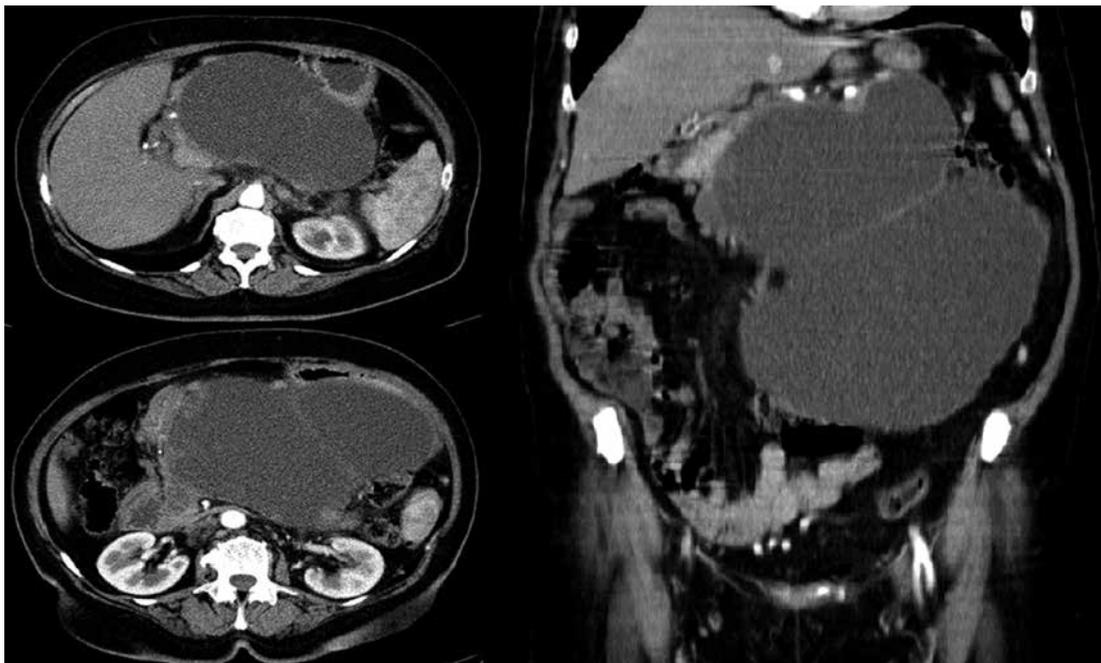


Figure 1. Contrast-enhanced computed tomography of the abdomen performed before the treatment

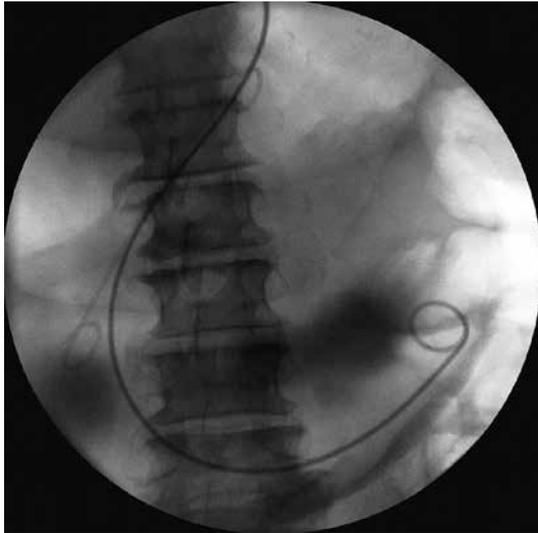


Figure 2. Transmural drainage of the WOPN

performed. The procedure revealed a complete disruption of the main pancreatic duct (MPD). Part of the MPD in the head of the pancreas was contrasted through the major duodenal papilla, from where the contrast flowed down to the cavity of the WOPN (Figure 3). Sphincterotomy was performed before a mechanical dilatation of the MPD in the head of the pancreas using a 10-Fr dilator. A transpapillary 8-Fr nasocystic drain and 10-Fr pancreatic stent were inserted (Figure 4). The decision to perform the endoscopic necrosectomy was made due to the presence of tissue elements in the cavity of the collection (Figure 5). The numerous necrotic tissues were removed through the major duodenal papilla using the Dormia basket under fluoroscopy imaging (Figure 6). Endoscopic necrosectomy was performed three times during the drainage. After 42 days of active trans-



Figure 3. Complete disruption of the main pancreatic duct

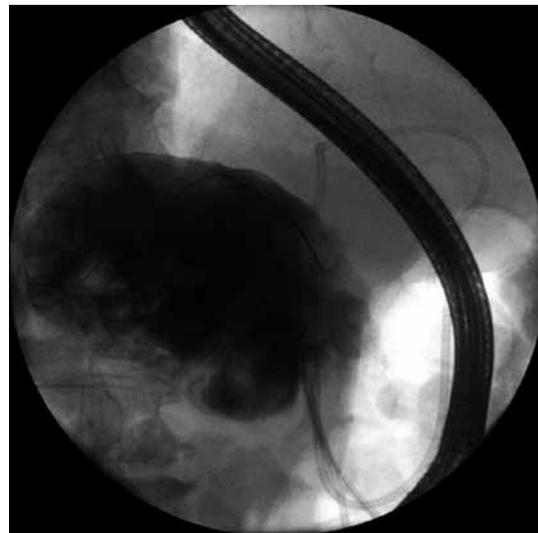


Figure 4. Transpapillary drainage of the WOPN



Figure 5. Endoscopic necrosectomy under fluoroscopy imaging. The Dormia basket was inserted in the collection of the necrosis

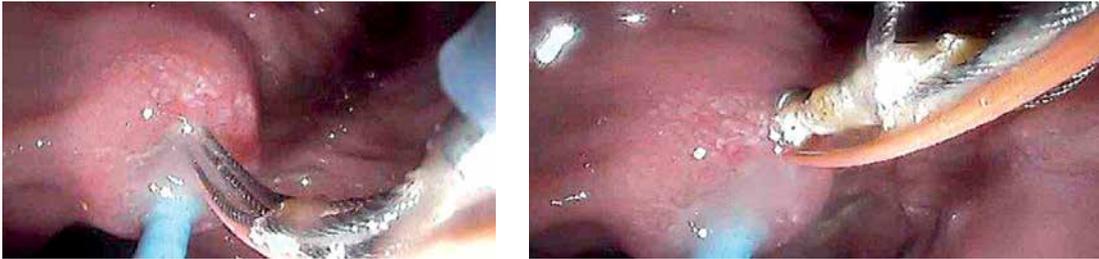


Figure 6. Endoscopic necrosectomy under fluoroscopy imaging. The nasocystic drain was guided through the major duodenal papilla in the cavity of the WOPN

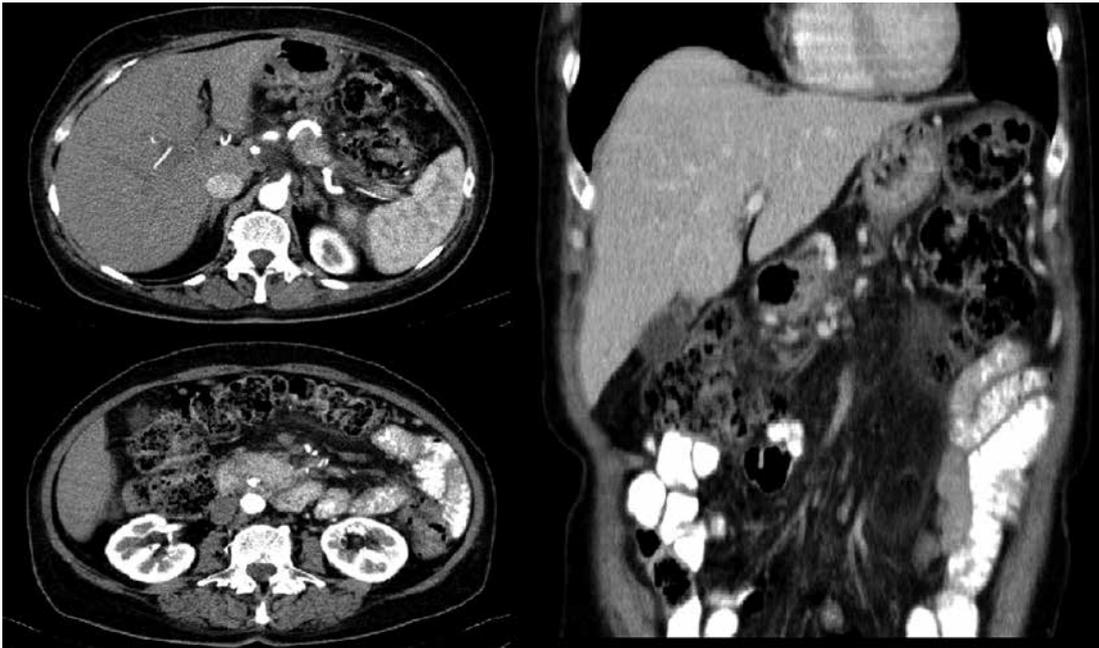


Figure 7. Contrast-enhanced computed tomography of the abdomen performed after endoscopic treatment



Figure 8. Endoscopic retrograde pancreatography after the passive drainage of the necrosis

mural drainage and 30 days of active transpapillary drainage, clinical symptoms resolved. Regression of the WOPN (collection < 3 cm) was observed, which enabled removal of the nasocystic drain, leav-

ing transmural and transpapillary stents in order to avoid return of the collection. During the next hospitalization and three months after the end of active drainage, CECT of the abdomen (Figure 7) indicated complete regression of the collection. This allowed transmural and transpapillary stents to be removed (Figure 8). After the therapeutic process the patient formally allowed our team to publish her case of treatment for scientific purposes.

Conflict of interest

The authors declare no conflict of interest.

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