

## Abstract

Endoscopic transgastric necrosectomy is a new technique that involves drainage and direct retroperitoneal endoscopic necrosectomy through the gastric wall. This procedure is demonstrated in a 67-year-old male patient who was referred for infected pancreatic necrosis due to a biliary pancreatitis. This article is part of an expert video encyclopedia.

## Keywords

Collection; Endoscopic transgastric necrosectomy; Pancreatic necrosis; Standard endoscopy; Video.

## Video Related to this Article

Video available to view or download at doi:10.1016/S2212-0971(13)70239-5

## Materials

- Endoscope: Olympus GIF 1TQ160; Olympus Corp., Tokyo, Japan.
- Needle knife with guidewire channel: Needle Knife; MTW Endoskopie, Wesel, Germany.
- Guidewire: Hydra Jagwire; Boston Scientific, Natick, USA.
- Hydrostatic dilatation balloon: CRE wire-guided dilation balloon; Boston Scientific, Natick, USA.
- Fully covered self-expandable metal endoprosthesis: WallFlex biliary 10 × 60 mm; Boston Scientific, Natick, USA.
- Stone extraction basket: FlowerBasketV; Olympus, Tokyo, Japan.
- Snare: SnareMaster 25 mm; Olympus, Tokyo, Japan.

## Background and Endoscopic Procedures

Infected fluid collections in the bursa omentalis occur in some cases of acute pancreatitis. A transgastric or transduodenal drainage with placements of plastic endoprosthesis to maintain access to the cavity is an accepted treatment option for this indication. In case of necrosis or purulent fractions, the small stents can be blocked. This can be prevented by a gastro- or duodenostomy with endoscopic necrosectomy and implantation of a larger fully covered metal stent.<sup>1</sup> In most cases, three or four sessions are needed for a complete cleaning.<sup>2</sup> The retroperitoneal approach can be performed endoscopically in case of a distinct bulging of the intestinal wall and no adverse findings in the endoscopic ultrasound (EUS) or computed tomography (CT) scan. In some cases, an EUS-guided

approach may be necessary, but the basic technique remains the same. If possible the intervention should be postponed until demarcation of the necrosis.<sup>3,4</sup>

The authors describe their technique of an endoluminal retroperitoneal access. The usage of CO<sub>2</sub> instead of air is recommended to reduce the risk of severe pneumoperitoneum and air embolism. Under sedation with propofol the endoscope is inserted. A stable and appropriate position of the endoscope for intervention is crucial. A needle knife with a preloaded guidewire is inserted through the working channel. The intestinal wall is punctured by application of cutting current. When the needle reaches the fluid collection, the needle is retracted and the guidewire is inserted in the cavity. The needle knife is removed while the wire is left in place. A hydrostatic dilatation balloon is inserted over the wire and insufflated under endoscopic visualization. After the gastro- or duodenostomy is established, the endoscope can proceed into the cavity. Rinse with NaCl. To avoid aspiration sucking the fluids in the stomach from time to time is recommended. Afterward, the abscess cavity may be examined. With dormia baskets and soft snares, debris and necrosis should be easily removed. In the first approach, this step is done very cautiously, being reluctant to prevent bleeding. Debris and demarked necrosis may be more clearly identified in a second session. For maintenance of the entrance a short but voluminous self-expandable, fully covered metal stent is positioned. Every 2–3 days the debridement is continued until the cavity is completely clean and granulation tissue is visible. The metal stent can then be removed. A closure of the intestinal wall is not necessary and will occlude in a few days. In case of a large remaining cavity, one or two pigtail-shaped plastic stents are applied, which can be removed after complete collapse.

In the literature, the endoscopic necrosectomy shows very decent results and is superior to a percutaneous drainage.<sup>5</sup>

## Key Learning Points/Tips and Tricks

- Transgastric necrosectomy is indicated in patients with persistent infection of peripancreatic necrosis in spite of

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- antibiotic therapy, or in patients with large symptomatic collections.
- The procedure can be performed with endoscopic ultrasound guidance; however, if there is significant bulging of the stomach wall, performance with a forward-viewing endoscope is also safe.
  - Whenever possible, intervention is postponed until the collections with necrosis are demarcated. Demarcation facilitates necrosectomy and reduces complications related to debridement procedures.
  - Be careful during removal of debris inside the necrotic cavity as manipulation might cause severe bleeding.
  - To maintain the access between the necrosectomy sessions, a fully covered metal stent is inserted.

### Scripted Voiceover

Time (min:sec)	Voiceover text
00:00	This is a 67-year-old male patient with an infected peripancreatic necrosis 4 weeks after the onset of severe biliary pancreatitis. CT-scan shows a 10 cm partially solid necrosis in the pancreatic head. At the endoscopic view you see that this mass causes bulging of the posterior wall of the antrum.
00:30	Here we demonstrate an endoscopic transgastric necrosectomy procedure with a forward-viewing therapeutic gastroscope. First we have to establish an access to the necrotic cavity with a needle knife.
00:54	While gently pressing the needle knife against the posterior wall we start the puncture with a small horizontal cut using the endocut mode. Subsequently you see some minor bleeding mixed with fluid parts of the necrosis.
01:20	The needle knife device completely perforates the stomach wall and allows easy insertion of a guide-wire in the necrotic cavity. Now the needle knife can be removed. This is important: make sure that you select a puncture site that allows stable and easy access to the cavity.
01:50	After the puncture we need to wait and suck the fluid that is pouring out of the cavity to avoid aspiration. We further advance the guidewire until it has a straight and stable position.
02:10	Now we need to establish the access to the cavity with hydrostatic balloon dilatation of the puncture tract.
02:25	A stepwise dilatation from 12 up to 15 mm is performed.
02:40	During transgastric necrosectomy we have the option to use fluoroscopic control and endoscopic ultrasound guidance for the puncture. In this case we did not feel that we need these modalities, because there were no intervening big vessels on previous EUS.

03:19	Now we inspect the dilatation tract through the balloon and deflate intermittently to exclude significant bleeding. Some yellowish debris is already pouring out.
03:51	Following the balloon the endoscope enters the necrotic cavity. We highly recommend using CO <sub>2</sub> instead of air for insufflation to avoid the rare but fatal complication of air embolism.
04:15	Balloon and guidewire have been removed. First we start with extensive rinsing of the cavity, using the endowasher. You can see yellow necrotic particles and vital red tissue. Because of the vicinity of big vessels, we act extremely carefully. By the way: It is important to have all patients on peri-interventional antibiotics since the procedure might induce bacteremia and provoke severe septic episodes.
04:50	When is endoscopic necrosectomy indicated? Well, in general we do transgastric necrosectomy only in patients with persistent infection in spite of antibiotic therapy or in patients with large symptomatic collections. Whenever possible, intervention is postponed until the collections with necrosis are demarcated. Demarcation facilitates necrosectomy and reduces complications related to debridement procedures.
05:36	In a second step a dormia-basket is introduced for carefully debridement. We also use twisted, soft polypectomy snares.
05:55	To avoid injury of intact tissue and therefore bleeding, we act slowly: grasping superficially and pulling only if there is no significant resistance. The procedure is repeated every 2 to 3 days until the necrotic material is completely removed and a clean cavity covered with granulation tissue is achieved. To retain the access between the necrosectomy sessions a fully covered metal stent is inserted, which is removed at the end of the last debridement. If the clean cavity is large, we temporarily insert pigtail-shaped plastic stents, which are removed 3 months after complete collapse of the cavity.
07:33	We finished the first session of necrosectomy with the insertion of a fully covered biliary wallstent of 10 mm diameter and 60 mm length in the gastrostomy site. This was because of a temporary shortage of dedicated metal stents.
08:03	Finally you see an endoscopic view and a CT-scan of the metal stent connecting the necrotic cavity with the lumen of the stomach. Altogether, this patient required four subsequent sessions of endoscopic debridement. One month later he underwent an uncomplicated open cholecystectomy and at follow up the patient was free of symptoms.

### References

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