

Endoscopic Necrosectomy of Walled-Off Necrosis following Severe Pancreatitis Using a Hot Axios™ Stent – A Case Series

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Keywords

Pancreatitis · Hot Axios · Self-expandable metal stents · SEMS · Lumen-apposing metal stents · LAMS · Necrosectomy · Endoscopic treatment

Abstract

Background: Walled-off necrosis is a common complication of severe pancreatitis. Guidelines recommend endoscopic transgastric necrosectomy as therapy of choice. Different endoscopic approaches are possible. **Methods:** We retrospectively analyzed our series of 9 patients where necrosectomy was performed after application of a lumen-apposing metal stent (LAMS) delivered using a Hot Axios™ Stent device. **Results:** In all 9 cases, the walled-off necrosis resolved completely. Necrosectomy was performed through the LAMS (mean: 5.7 times). Endoscopic necrosectomy was repeated every 3rd–7th day using 10- or 15-mm snares. There were no major complications. Especially, no early or delayed bleeding was seen. **Conclusion:** The Hot Axios™ Stent device is a safe method for necrosectomy of walled-off necrosis. It enables puncture, drainage, and LAMS insertion in a single delivery, followed by several courses of necrosectomy if needed without stent exchange.

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Background

Necrotizing pancreatitis develops in up to 20% of all patients with acute pancreatitis. Roughly 40% of those are in need of intervention, mostly due to infected or complicated walled-off necrosis (WON) [1–3]. The ESGE guidelines recommend endoscopic transgastric necrosectomy as therapy of choice [4] because of its reduced complication rates, lower costs, and better quality of life achieved [5–8]. WON is a major complication, requiring necrosectomy to clean the necrosis. In these patients, more data is currently still required to evaluate the best access to the necrotic cavity [9, 10]. Possible options for maintaining a transgastric access are multiple plastic double-pigtail stents or self-expandable metal stents (SEMSs), either fully covered biliary SEMSs or lumen-apposing metal stents (LAMSs) [4, 11]. Metal stents, especially LAMSs, shorten the procedure time and seem to have a superior clinical success rate [12]. Safety and therapeutic efficacy of this device in pancreatic fluid collections and WON have been described in a few small studies [13, 14], but complications such as bleeding have also been reported [15, 16].



Fig. 1. CT scan of a walled-off necrosis following severe pancreatitis after placement of a Hot Axios™ Stent.

Case Series

Here, we report a clinical case series of 9 patients (Table 1) with endoscopic necrosectomy of WON using a Hot Axios™ Stent device (Boston Scientific, Natick, MA, USA).

In all 9 reported cases of our cohort, WON was diagnosed by CT scan and endoscopic ultrasound. In 8 cases, WON followed an episode of acute pancreatitis, and in 1 case, it followed an acute exacerbation of chronic pancreatitis. Alcohol abuse was the underlying cause in 5 patients and biliary pancreatitis in another 3. In 1 case, the cause of pancreatitis remains unclear, possibly due to a lipid disorder. Further patient characteristics are shown in Table 1.

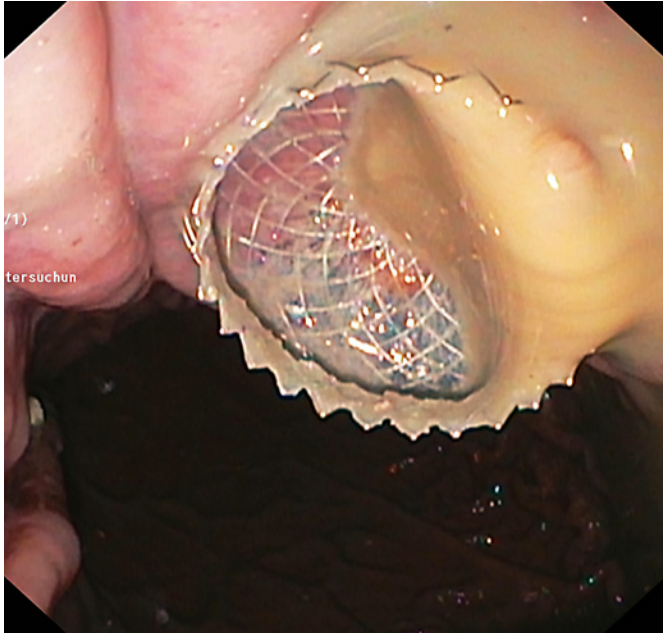
In all 9 cases, the transgastric insertion of the Hot Axios™ Stent was achieved under EUS guidance (GFUCT180, Olympus, Shinjuku, Tokyo, Japan). The patients were sedated using both midazolam and propofol. The total procedure time of stent placement was 15.2 ± 4.7 min. All patients showed solid necrosis on CT scan after placement of the Hot Axios™ Stent (Fig. 1). In addition, all 9 patients had severe clinical signs of an infected WON, such as fever, high CRP levels (>100 mg/dL), and leukocytosis. Therefore, all patients received antibiotic therapy with meropenem. In addition, 3 patients received vancomycin and 1 patient linezolid due to an inadequate decline in the CRP level despite meropenem therapy to better cover gram-positive bacteria.

Table 1. Patient characteristics, number and duration of necrosectomies, and total duration of stent therapy

Patient	Sex	Age, years	Necrosectomy		Duration of stent therapy, weeks
			<i>n</i>	duration, weeks	
1	male	75	3	8	10
2	female	62	3	2	14
3	male	39	15	16	24
4	male	52	6	7	12
5	male	51	6	5	12
6	female	65	8	8	10
7	female	59	8	9	17
8	female	83	2	2	8
9	male	69	1	1	6

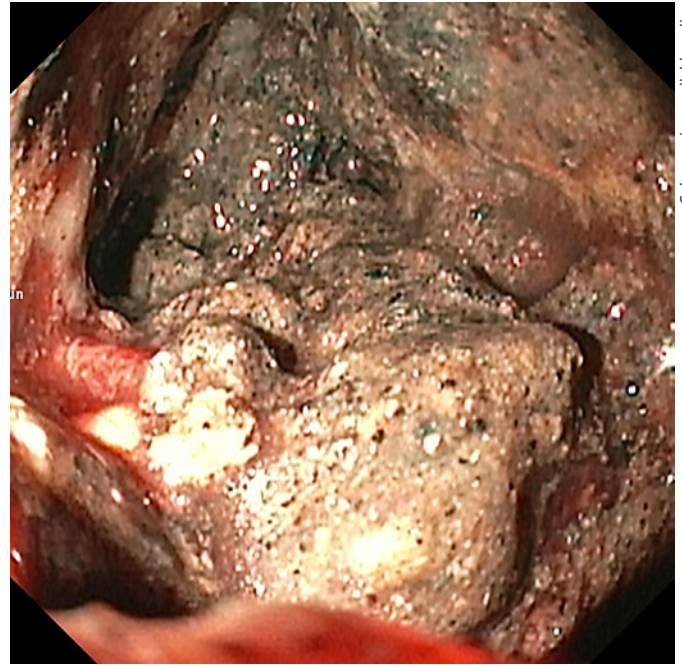
Treatment was performed as direct transluminal endoscopic necrosectomy (Fig. 2), using a GIF-HQ190 endoscope (Olympus, Shinjuku, Tokyo, Japan) and CO₂ insufflation. The pancreatic necrosis (Fig. 3) was removed using standard 10- and 15-mm snares. An exemplary case of the whole procedure is shown in Video 1. Endoscopic necrosectomy was repeated every 3rd–7th day depending on the endoscopic presentation of the necrosis, and until the infection parameters and clinical signs of infection had recovered almost completely. Necrosectomy was performed a mean 5.7 times (1–15) over a course of 1–16 weeks. The duration of necrosectomy was 45–75 min every session. After complete necrosectomy, the Hot Axios™ Stent remained in place for further 2–12 weeks before endoscopic removal (Table 1). There were no periprocedural complications in our cohort. No major complications like bleeding or rupture occurred. Especially, we found no delayed bleeding in our cohort in contrast to previous publications [16]. In all 9 cases, WON resolved completely due to endoscopic necrosectomy, and no further surgical treatment was necessary. In 1 case, the stent migrated into the stomach after 5–6 weeks of application due to completely resolved WON. The patient did not notice the migration, and the stent was excreted without symptoms during the follow-up period. In all other cases, the Hot Axios™ Stent was removed endoscopically without difficulties.

The initial costs using the Hot Axios™ Stent device are quite high. However, in some countries – like in Germany – there is the possibility of a refund by the insurance companies. In our cases, the use of the Hot Axios™ Stent was therefore only slightly more expensive than using plastic stents or other LAMSs. Even if there is no such



Color version available online

Fig. 2. Endoscopic image of the inserted and unfolded Hot Axios™ Stent.



Color version available online

Fig. 3. Endoscopic image of the appearance of the walled-off necrosis through the Hot Axios™ Stent.

Video 1. Shown is an exemplary case of the complete endoscopic necrosectomy procedure of walled-off necrosis: from EUS-guided placing of the Hot Axios™ Stent, necrosectomy sessions, until the solid necrotic parts of the walled-off necrosis have been removed completely.

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prospect, the possibility to perform repeated necrosectomies through one stent without using new stenting material leads to lower costs after the third necrosectomy compared to plastic stents.

Overall, the Hot Axios™ Stent device enables puncture, drainage, and LAMS insertion very rapidly. Furthermore, the first course of necrosectomy as well as subsequent courses can be done without additional invasive procedures such as tract dilatation, cystostomy, and stent exchanges.

Statement of Ethics

Written informed consent was obtained from all patients prior to the endoscopic procedures. The study design was retrospective. The study protocol conforms to the ethical guidelines of the 1975 Declaration of Helsinki. The study was approved by the Ethics Committee of the University Hospital Regensburg prior to the start of the study.

Disclosure Statement

The authors declare that they have no conflicts of interest to disclose.

Funding Sources

No funding was received for this study.

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Author Contributions

K.W. and A.K. performed the reported procedures. A.M. analyzed data. K.W. and A.M. wrote a first draft of the manuscript. K.W. took the video. H.G. was responsible for the CT scans and edited the CT scans used. M.M. gave significant scientific input. All authors critically reviewed the manuscript and approved the final version.