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Percutaneous endoscopic necrosectomy for walled-off necrosis in the retroperitoneal space of the elderly: A case report

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Abstract

BACKGROUND

Walled-off necrosis (WON) is a late complication of acute pancreatitis possibly with a fatal outcome. Even for WON spreading to the retroperitoneal space, percutaneous endoscopic necrosectomy (PEN) can be an alternate approach to surgical necrosectomy, particularly for the older individuals or patients with poor condition because of WON.

CASE SUMMARY

An 88-year-old man was admitted to our hospital with a jaundice. Endoscopic retrograde cholangiopancreatography (ERCP) was performed to improve jaundice; however, post-ERCP pancreatitis developed. The inflammation of pancreatitis spread widely from the right retroperitoneal cavity to the pelvis, and WON was formed 4 wk later. A percutaneous drainage tube was placed into the WON under computed tomography guidance. However, the drainage did not ameliorate clinical symptoms including fever, which assured less invasive necrosectomy. A metallic stent for the upper gastrointestinal (GI) tract was placed from the percutaneous drainage route. An upper GI endoscope was inserted into the inside of the WON through the metallic stent, and the necrotic tissues were bluntly removed with a snare forceps. Ten times of these necrosectomies resulted in the near-complete removal of necrotic tissues. These procedures consequently abated his fever and remarkable improvement in blood tests.

CONCLUSION

PEN for WON occurring in the retroperitoneal space was safe and effective for very old individuals.

Key Words: Walled-off necrosis; Percutaneous drainage; Endoscopic necrosectomy; Post endoscopic retrograde cholangiopancreatography pancreatitis; Elderly; Case report

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Core Tip: Percutaneous endoscopic necrosectomy (PEN) is an approach for the walled-off necrosis (WON) developing in the retroperitoneal space distant from the stomach or duodenum. Surgical necrosectomy is at high risk for older and frail patients, and less invasive drainage methods are ideal. We performed PEN for elderly with WON and were able to complete the treatment safely without complications.

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INTRODUCTION

Walled-off necrosis (WON) is a late complication of acute pancreatitis. The Atlanta Classification in 2012 defined WON as a necrotic reservoir > 4 wk after the onset of necrotizing pancreatitis[1]. Approximately 15% of severe acute pancreatitis patients are complicated by WON[2]. Moreover, 40% of patients with WON are complicated by organ failure, associated with longer hospital stays and high mortality rate[2].

Recently, endoscopic transluminal drainage and necrosectomy for WON have been widely accepted because of its clinical success rate of 80%-94%, an adverse event rate of 8%-25%, and a mortality rate of < 10%[3]. However, transluminal drainage is technically difficult when WON is located away from the stomach and duodenum, such as in the retroperitoneal space or paracolic gutters.

Percutaneous endoscopic necrosectomy (PEN) is one of the drainage methods for such cases. Herein, we report a very old patient with the WON widely spreading from the right retroperitoneal cavity to the pelvis, and the PEN was effective as a minimally invasive treatment method.

CASE PRESENTATION

Chief complaints

The patient mainly complained of jaundice.

History of present illness

An 88-year-old man was admitted to our hospital with jaundice. Computed tomography (CT) revealed stenosis in the lower bile duct and dilation of a common bile duct. Endoscopic retrograde cholangiopancreatography (ERCP) was performed to reduce the jaundice. However, abdominal pain manifested on the next day and post-ERCP pancreatitis developed.

History of past illness

The patient had a history of hypertension.

Personal and family history

The patient's personal and family history was unremarkable.

Physical examination

Abdominal pain was present at the onset of post-ERCP pancreatitis. It gradually subsided. However, fever and malaise persisted.

Laboratory examinations

Blood tests showed persistently high C-reactive protein level.

Imaging examinations

A CT performed 4 wk after ERCP revealed WON in the right perinephric space spreading to a bladder rectal fossa (Figure 1A). The major axis of WON was about 31 cm.



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Figure 1 Computed tomography scan. A: Computed tomography scan 4 wk after endoscopic retrograde cholangiopancreatography. Encapsulated, internally heterogeneous necrotic material expanded into the right retroperitoneal space (white arrowhead). They were walled-off necrosis findings after acute pancreatitis; B: Computed tomography after 10 necrosectomies revealed reduction of the necrotic material in right retroperitoneal space.

FINAL DIAGNOSIS

The patient was diagnosed with WON.

TREATMENT

An 8-Fr percutaneous drainage tube was placed toward the WON under CT guidance. However, drainage tube placement alone did not improve the inflammatory response, requiring a necrosectomy. However, surgical necrosectomy under general anesthesia was a high risk of perioperative complications because of malnutrition and large pleural effusions. So, he was proposed for PEN of the WON. Eight weeks after ERCP, the percutaneous drainage tube was removed and the fistula was extended to 18 mm with a dilation balloon catheter (CRE PRO GI Wireguided Balloon Dilation Catheter; Boston Scientific, Co., Ltd., MA, United States). A 20 mm diameter gastroduodenal partially covered metallic stent (Niti-S; Taewoong Medical Co., Ltd., Gimpo, South Korea) was placed from the percutaneous drainage route. Immediately after the placement of metallic stent, the lumen was poorly dilated and expanded gradually. Moreover, because the stent was partially covered, there was a possibility that the position of the stent would be displaced if the endoscope was inserted immediately after the placement of the stent. For these reasons, PEN was performed 3 days after stenting. The endoscope was GIF-XZ1200 (Olympus, Co., Ltd., Tokyo, Japan) and snare forceps (SnareMaster Plus 25mm; Olympus) were used to bluntly remove the necrotic materials. A total of 10 necrosectomies were performed over 2 mo. Most of the necrotic material could be removed in about 3 wk; however, its removal from in the ventral side of the kidney and pelvic cavity was time-consuming.

OUTCOME AND FOLLOW-UP

CT revealed a small amount of residual WON in a ventral aorta and near a bladder; however, the necrotic tissues in the right retroperitoneal space were apparently reduced (Figure 1B). Occasional low-grade fever appeared, but improved conservatively. The stent was removed 12 wk after placement. Granulation tissue grew inside the stent and manual removal was difficult. It was bluntly removed under general anesthesia and cauterization of the dissected surface was performed. The fistula spontaneously shrunk after stent removal. Although rehabilitation was continued, he was transferred to another hospital 6 mo after admission because he was old and had limited ability to improve muscle strength.

DISCUSSION

A surgical step-up approach is proposed as a percutaneous drainage method. In this method, a percutaneous drainage tube is placed first, and if there is no improvement, a surgical necrosectomy is performed[4]. In a comparative study with

Table 1 Overview of studies and case reports regarding percutaneous endoscopic necrosectomy

Ref.	Patients, n	Mean age, yr	Oldest age, yr	Size of collection, mean, cm	Previous endoscopic/surgical treatment attempt (n)	Mean number of PEN sessions performed	Devices used for necrosectomy	Length of time stent in place, mean, days	Clinical success, n (%)
Bakken <i>et al</i> [6], 2011	1	75	75	NA	PCD	NA	Snares, rat toothed forceps	NA	1/1 (100)
Bakken <i>et al</i> [7], 2011	2	70	74	NA	NA	2.5	NA	25	2/2 (100)
Patil <i>et al</i> [8], 2021	1	59	59	14	PCD	4	Snares, stone retrieval baskets	28	1/1 (100)
Binda <i>et al</i> [9], 2021	1	61	61	NA	PCD, ETN	4	Snares	14	1/1 (100)
Ke <i>et al</i> [10], 2019	23	43	54	NA	PCD	2	Snares, grasping forceps	7	16/23 (69.57)
Thorsen <i>et al</i> [11], 2018	5	44	72	33.4	PCD (3), ETN (2)	5.75	Snares, tripod forceps, stone retrieval baskets	37.5	4/5 (80)
Tringali <i>et al</i> [12], 2018	3	45	64	15	PCD (3)	3	Dormia baskets	12.7	2/3 (66.67)
Saumoy <i>et al</i> [13], 2017	9	62	81	11.2	PCD (9)	3	Snares, stone retrieval baskets	14.7	8/9 (88.89)
D'Souza <i>et al</i> [14], 2017	1	32	32	NA	PCD	1	Snares	NA	1/1 (100)
Sato <i>et al</i> [15], 2016	1	13	13	NA	PCD	3	NA	17	1/1 (100)
Kedia <i>et al</i> [16], 2015	1	56	56	17	PCD, ETN	2	NA	NA	1/1 (100)
Cerecedo-Rodriguez <i>et al</i> [17], 2014	1	46	46	NA	PCD, surgical lavages	7	NA	NA	1/1 (100)
Navarrete <i>et al</i> [18], 2011	1	37	37	NA	PCD	4	NA	12	1/1 (100)
Laopeamthong <i>et al</i> [19], 2019	1	48	48	NA	PCD	4	Snares	NA	1/1 (100)
Our case	1	88	88	31	PCD	10	Snares, grasping forceps	84	1/1 (100)

PEN: Percutaneous endoscopic necrosectomy; PCD: Percutaneous catheter drainage; ETN: Endoscopic transluminal necrosectomy; NA: Not available.

endoscopic step-up approach that consisted of endoscopic ultrasound-guided transluminal drainage followed by endoscopic necrosectomy, if necessary, rates of major complications and death did not differ between surgical and endoscopic step-up approach[4]. However, pancreatic cutaneous fistula formation occurred more frequently in the surgical step-up approach group. Moreover, surgical necrosectomy must be performed under general anesthesia, making it difficult to perform in patients with poor general condition or elderly patients with many complications. However, PEN can be performed without general anesthesia.

PEN has been reported in a small number of cases, however, Jagielski summarized the outcomes of previous reports [5]. In this report, percutaneous esophageal self-expandable metallic stent (SEMS) was placed in 52 patients with WON, with a procedural success rate of 100% and clinical success rate of 80.8% (Table 1)[6-19]. Complications were observed in 34.6% of the patients, including complications unrelated to the procedure such as organ failure associated with acute pancreatitis and recurrence of fluid collection. No procedure-related deaths occurred. Hemorrhage requiring radiological or surgical intervention occurred in 10 patients, however they were unrelated to percutaneous SEMS placement and necrosectomy procedures. Cutaneous fistulas developed in two patients after SEMS removal, and one of which required surgery. A previous study reported that cutaneous fistula never occurred when percutaneous and transluminal endoscopic necrosectomy were performed at the same time[20].

Most of the cases in this report are under the age of 60, with only a few elderly patients discussed. In this case, we were able to perform PEN safely, without complications, even in an elderly patient who was approximately 90-year-old. Other reports have indicated that age does not play a role in the success rate of endoscopic transluminal drainage and necrosectomy[21,22], which might be the same for PEN.

In a report by Jagielski *et al*[5], the number of PEN procedures was less and the clinical success rate was high. In our case, although we were able to remove most of the necrotic material, the hospital stay of the patient was prolonged, and his activities of daily living were negatively affected. Moreover, fever and elevated inflammatory response seen in blood tests persisted, and the treatment period was prolonged because the WON in narrow spaces like the ventral side of the kidney and the pelvic cavity was difficult to remove. CT showed a large amount of necrotic material in the WON, making it difficult to treat with only an indwelling drainage tube. In such cases, considering the start of PEN sooner could potentially complete the treatment early. Current international guidelines recommend postponing endoscopic interventions for pancreatic necrosis until at least 4 wk after the onset of pancreatitis, helping to encapsulate and define necrosis. However, there are also reports that the number of complications does not increase when transluminal endoscopic necrosectomy is performed early than 4 wk after pancreatitis onset[23,24]. In this case, it may have been better to perform drainage and necrosectomy early, as soon as encapsulation of the necrotic material was confirmed.

Snare forceps are often used for necrosectomy, and were mainly used in our case as well. Grasping forceps were used in narrow spaces during the procedure; however, the necrotic material containing pus and fat was soft and difficult to grasp. Multi-prong forceps were not used because they might damage to blood vessels and kidneys, which are not visible due to necrotic material. Snare forceps are considered to be the first choice because they make it easier to grasp necrotic material and are less likely to damage surrounding organs.

In transluminal endoscopic necrosectomy, removal of the lumen-apposing metal stents within 4 wk is recommended due to the risk of perforation and migration. In this case, the stent was removed 12 wk after placement, which required general anesthesia. However, there were no stent problems during placement or after removal.

In the present case, WON was found mainly in the retroperitoneal space, and PEN would be appropriate. Because of old age and malnutrition, invasive procedures were not possible. If the percutaneous drainage tube did not work well as in this patient, PEN might be attempted for the elderly. However, it takes time for the elderly to recover appropriately to perform daily living activities, so it is necessary to determine the appropriate timing of treatment.

CONCLUSION

We experienced a case of WON that extensively spread to the retroperitoneal space but was relieved by PEN. The procedure was safe and effective even in older patients with frailty.

FOOTNOTES

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