

# Endoscopic removal of a migrated cystogastrostomy double pigtail stent through a pancreatico-duodenal fistula tract

Il Hyung Chung, Hee Wook Kim, Dong Ki Lee

Division of Gastroenterology, Department of Internal Medicine, Gangnam Severance Hospital, Yonsei University College of Medicine, Seoul, Korea

**Key words:** pseudocyst, pigtail stent, migration, fistula

**Abbreviations:** EUS, endoscopic ultrasound; CT, computed tomography; EGD, esophagogastroduodenoscopy

A common complication of pancreatitis is pseudocyst formation. Endoscopic drainage is a widely used treatment for pancreatic pseudocysts, and offers a definitive solution in approximately 75% of cases. Drainage-related complications may be related directly to the procedure or may occur later as stents and drains migrate or erode into adjacent structures. Procedure-related complications included bleeding, pancreatitis, and infection while stent-related complications may involve dislocation or clogging with subsequent infection. This report is the first description of the successful endoscopic removal of a migrated cystogastrostomy double pigtail stent through a pancreatico-duodenal fistula tract that developed more than six years after the stent was originally misplaced into a pseudocyst.

## Introduction

Pancreatic pseudocysts are common complications of acute or chronic pancreatitis. They occur in up to 10% of patients with pancreatitis, and represent about 20% of all cystic lesions of the pancreas.<sup>1</sup> Endoscopic drainage of pseudocysts is a preferred therapeutic approach because it is less invasive than surgery, avoids the need for external drains, and generally carries a high long-term success rate. Drainage-related complications either may be related directly to the procedure or can occur in relation to the stents themselves. Procedure-related complications include bleeding, infection, pancreatitis, or perforation. Stent-related complications include occlusion, dislocation, and migration of a stent into the pseudocyst. We report a case of successful endoscopic removal of a double pigtail stent that was dislocated into the pancreatic pseudocyst through a fistula tract that was developed after a six and a half year observation period.

## Case report

A 51-year-old woman with a medical history of traumatic pancreatic pseudocyst that had been diagnosed 2 years prior to presentation was admitted to our hospital complaining of abdominal pain. The patient's vital signs, physical examination, and laboratory data were within normal limits. Endoscopic ultrasound (EUS) showed

a well-demarcated, 6 cm cystic mass originating from the head of the pancreas that was bulging into the gastric antrum. After needle-knife incision of an antral bulging area, a guidewire was introduced into the pseudocyst, followed by introduction of a double pigtail stent (7 Fr / 4 cm) over the wire. However, during the procedure the distal tip of the stent iatrogenically migrated into the pseudocyst. Thereafter, another double pigtail catheter (5 Fr / 5 cm) was placed successfully between the stomach and the pseudocyst.

One month after the procedure, computed tomography (CT) scan showed shrinkage of the pseudocyst, and we removed the second pigtail stent (5 Fr / 5 cm), leaving the first pigtail stent (7 Fr / 4 cm) inside the cyst. The patient visited our outpatient clinic annually, and follow-up CT scan was performed at every visit. For a long period of follow up, there was no interval change noted on CT (**Fig. 1**), and the patient exhibited no related symptoms. After 6.5 years, esophagogastroduodenoscopy (EGD) was performed for evaluation of epigastric pain and showed that the previous displaced pigtail stent (7 Fr / 4 cm) was slightly protruding into the superior wall of the duodenal bulb through a pancreatico-duodenal fistula (**Fig. 2**). The stent was removed by grasping it with a pair of forceps (**Fig. 3**). The next day, follow-up EGD showed healing of the fistula orifice (**Fig. 4**), and the patient was discharged without complications.

## Discussion

About 41% of patients with pancreatic pseudocysts may experience complications such as rupture, abscess, jaundice, and hemorrhage if no treatment is performed.<sup>3</sup> Nevertheless, observation is

\*Correspondence to: Dong Ki Lee; Email: dkleee@yuhs.ac

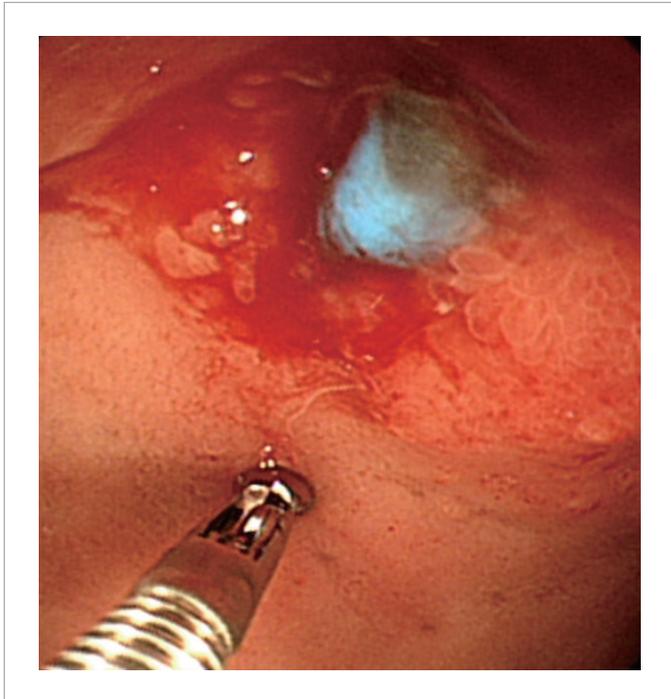
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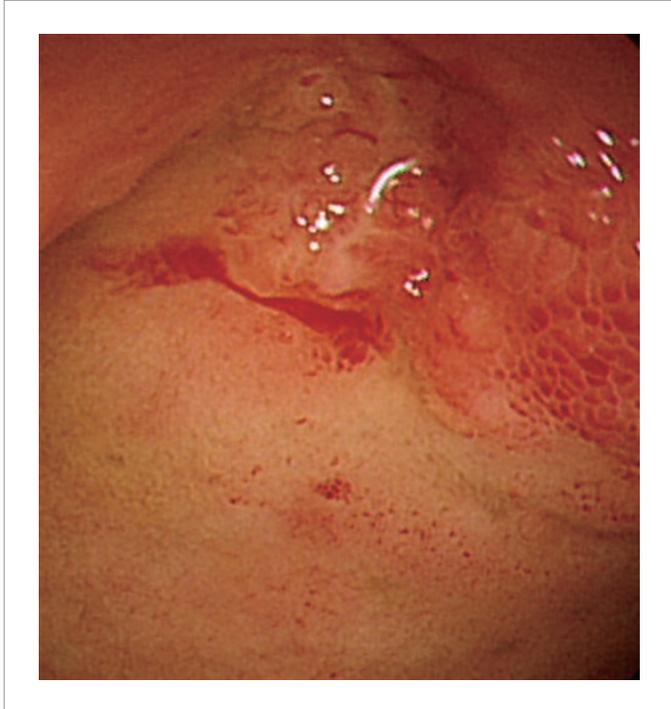
**Figure 1.** The dislocated double pigtail stent is seen in a shrunken pseudocyst on CT scan.



**Figure 2.** The curved tip of the double pigtail stent (7 Fr / 4 cm) was seen protruding into the duodenal bulb through a pancreatico-duodenal fistula.



**Figure 3.** The double pigtail stent (7 Fr / 4 cm), which was removed endoscopically through a pancreatico-duodenal fistula.



**Figure 4.** Healed fistula orifice at the duodenal bulb.

justified by the fact that not all pseudocysts resolve spontaneously. Small pseudocysts (< 5 cm) and those located in the tail are likely to resolve on their own.<sup>4</sup> However, in symptomatic patients or in lesions exceeding 7 cm interventional therapy is commonly performed.

There are a variety of treatment options for pseudocyst drainage including surgical, percutaneous and endoscopic approaches. Percutaneous and endoscopic approaches are reported to result in higher recurrence rates of up to 22-24%, but both these minimally invasive techniques are associated with lower complication rates in the range of 5-10%.<sup>5</sup> Percutaneous transgastric placement of stents or catheters is a routine method derived from commonly accepted surgical methods. Several studies have reported this approach to be safe and effective.<sup>6,7</sup> Endoscopic drainage (transgastric or transduodenal) is another widely used treatment for pancreatic pseudocysts,<sup>8,9</sup> and offers a definitive solution in almost 75% of the cases.

Endoscopic drainage-related complications may be related directly to the procedure or can occur in relation to stents and drains. Procedure-related complications may include bleeding, pancreatitis, and infection (bacteremia, sepsis, abscess formation). Stent-related complications generally involve dislocation and clogging with subsequent infection.

Pigtail stents may be inferior in drainage capacity to straight stents, but the risk of migration of pigtail stents is lower.<sup>10</sup> Iatrogenic migration of double pigtail stents into the pseudocyst during endoscopic treatment of pancreatic pseudocysts is an unusual complication.<sup>2</sup> Marking the distal straight end of a double pigtail stent with pen may help to prevent this complication.

Henriksen et al. reported in three cases of stents which had migrated into the pseudocysts who were treated with immediate surgery.<sup>13</sup> However, recent advances in therapeutic endoscopy may allow removal of the migrated stents without surgery, even in cases of pseudocyst infection caused by dislocated stents. Mahnken et al. reported a case of immediate transgastric repositioning of the dislocated drainage stent with a fluoroscopically guided snaring technique,<sup>14</sup> and Varadarajulu reported a case of successful retrieval of a stent using an over-the-wire balloon dilator by fluoroscopic guidance in a similar case.<sup>15</sup> Rodrigues et al. reported another case of endoscopic retrieval of a migrated straight plastic stent.<sup>16</sup>

According to previous reports, patients with migrated stent that cause pseudocyst infection should undergo percutaneous drainage as an initial treatment, and surgical drainage of the infected pseudocyst should be performed in patients who do not respond to endoscopic or percutaneous drainage.<sup>17</sup> That is, immediate pseudocyst drainage and stent repositioning or removal should be performed in patients with migrated stents that cause pseudocyst infection. However, because the endoscopic retrieval of a stent that has migrated into the pseudocyst is technically challenging and requires the use of multiple endoscopic accessories and fluoroscopy,<sup>7</sup> we suggest that observation without stent removal

or repositioning may be reasonable in asymptomatic patients and the migrated drainage stent has not caused pseudocyst infection. After pseudocyst resolution, the migrated stent will remain as a foreign body in a dead space and it may remain there without causing any significant clinical sequelae. The end of the stent may also cause fistula formation with adjacent organs such as the duodenum.

In the present case, the pancreatico-duodenal fistula was probably formed by chronic irritation of the duodenal wall by the internalized stent. We suggest that completely dislocated stent can be removed endoscopically with ease in cases in which a pancreatico-duodenal fistula has formed over time.

### Disclosure

The authors declare no conflict of interest.

The authors confirm no financial interest in a business or commercial entity that relates to the manuscript.

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