

A Case of Complete Resolution of Mediastinal Pseudocyst and Pleural Effusion by Endoscopic Stenting of Pancreatic Duct

Dong-Ju Kim, Hye-Won Chung, Chang-Woo Gham, Ho-Gyun Na, Seung-Woo Park, Se-Jun Lee, Jun-Pyo Chung, Si-Young Song, Jae-Bock Chung, and Jin-Kyoung Kang

Departments of Internal Medicine, Yonsei University College of Medicine, Seoul, Korea.

We report a case of a mediastinal pseudocyst with a pleural effusion that developed in a patient suffering from alcohol-related chronic pancreatitis. A 53-year-old man was admitted to another institution complaining of pleuritic chest pain and coughing. A chest X-ray revealed a pleural effusion with a collapse of the right middle and lower lobes. Pleural fluid taken by thoracentesis was exudative, and the patient was transferred to our institution. A CT scan showed a loculated cystic lesion in the mediastinum and pancreatic changes that were consistent with chronic pancreatitis. The endoscopic retrograde cholangiopancreatography (ERCP) findings were compatible with chronic pancreatitis showing severe pancreatic ductal stricture at the head with an upstream dilation and distal bile duct stricture. After a one week of treatment with fasting and octreotide without improvement, both pancreatic and biliary stents were placed endoscopically. After stenting, the pleural effusion and pseudocyst rapidly resolved. The stents were changed 3 months later, at which time a repeated CT demonstrated a complete resolution of the pseudocyst. Since the initial stenting, he has been followed up for 7 months and is doing well with no recurrence of the symptoms, but he will need to undergo regular stent changes. Overall, endoscopic pancreatic stenting appears to be a good option for managing selected cases of mediastinal pancreatic pseudocysts.

Key Words: Mediastinal, pancreatic pseudocyst, pleural effusion, stents, pancreatic ducts

INTRODUCTION

Pancreatic pseudocysts arise as a complication

Received September 5, 2002

Accepted February 3, 2003

Reprint address: requests to Dr. Seung Woo Park, Department of Internal Medicine, Yonsei University College of Medicine, 134 Shinchon-dong, Seodaemun-gu, Seoul 120-752, Korea. Tel: 82-2-361-5484, Fax: 82-2-393-6884, E-mail: swoopark@yumc.yonsei.ac.kr

of acute pancreatitis, pancreatic trauma, or chronic pancreatitis.¹ They are usually located in the peri-pancreatic area, most commonly in the lesser sac. On rare occasions, a pseudocyst can reach the mediastinum. Several treatment modalities for mediastinal pancreatic pseudocysts are surgery or conservative care i.e. medical treatment including somatostatin or its analog, octreotide, interventional treatment including internal or external drainage, and an endoscopic approach such as stenting. More recently, an endoscopic transpapillary stent placement was introduced as a therapeutic option for mediastinal pseudocysts, pancreatic fistula and communicating pseudocysts in patients who do not respond to conservative treatments.²⁻⁶

We report a case of alcohol-related chronic pancreatitis complicated by a mediastinal pancreatic pseudocyst that was successfully treated with a transpapillary stent placement as the primary therapy.

CASE REPORT

A 53-year-old man was admitted to a hospital complaining of right chest pain during inspiration and coughing. He has been habitually drinking more than 80g alcohol per day for more than 30 years. A chest radiograph revealed a right pleural effusion and a collapse of the right middle and lower lobe (Fig. 1A). A thoracentesis with a pleural biopsy that was performed for diagnosis revealed that the pleural fluid was exudative but

the cultures and cytology were negative for bacteria or malignancies. He was then transferred to our institution for a further evaluation. A chest PA revealed a newly developed left pleural effusion. Biochemical analysis of the pleural fluid on admission revealed an exudative pattern again and an amylase level of 5890 IU/L. The serum amylase and lipase levels were elevated to 1225 and 1140 IU/L, respectively. A chest CT confirmed the presence of the effusions and showed changes consistent with chronic pancreatitis with a pseudocyst and a loculated pseudocyst in the mediastinum (Fig. 1B). There was no evidence of debris in the mediastinal pseudocyst. The pleural effusions and pseudocyst were believed to be complicated from the acute pancreatitis superimposed on the chronic pancreatitis. Although the patient was kept in a fasting state and 300 μ g/day octreotide was administered intravenously for one week, the serum amylase level did not normalize

and the amount of pleural effusion increased. ERCP was performed as a therapeutic intervention. The ERCP findings showed a ductal stricture at the pancreatic head with an upstream dilation and also at the distal bile duct, which were compatible with chronic pancreatitis. Several small pancreatic pseudocysts were also noted (Fig. 1C). Even though a communication between the pancreatic duct and mediastinal pseudocyst was not documented on the pancreatogram because a forceful dye injection was avoided due to the risk of a pseudocyst infection, the mediastinal pseudocyst was believed to have occurred by a leakage of pancreatic juice. As the ductal stricture at the pancreatic head was critical enough to obstruct the downstream flow of pancreatic juice, it was decided to stent the pancreatic duct. After performing sphincterotomy with a standard sphincterotome, a 7Fr, 7 cm plastic stent was inserted into the pancreatic duct and another 10Fr, 5 cm

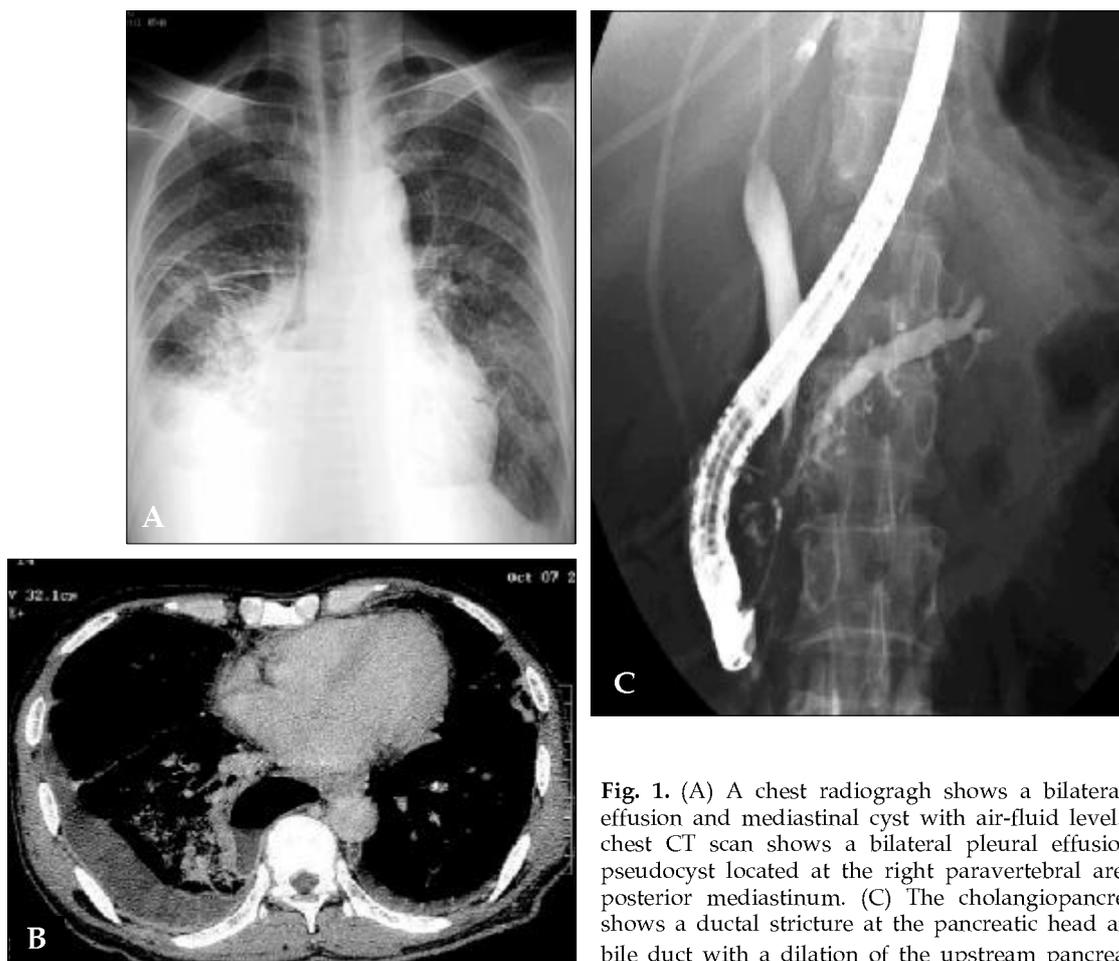


Fig. 1. (A) A chest radiograph shows a bilateral pleural effusion and mediastinal cyst with air-fluid level. (B) The chest CT scan shows a bilateral pleural effusion and a pseudocyst located at the right paravertebral area in the posterior mediastinum. (C) The cholangiopancreatogram shows a ductal stricture at the pancreatic head and distal bile duct with a dilation of the upstream pancreatic duct.

plastic stent was placed into the biliary duct (Fig. 2). After double stenting of the pancreatic and biliary ducts, the pleural effusion rapidly regressed during the following three days (Fig. 3A), and the serum amylase returned to normal after one week. In addition, the pseudocyst had regressed. He remained asymptomatic after resuming a regular diet and was discharged home. The stents were changed 3 months later at which time a repeated chest CT demonstrated a complete resolution of the mediastinal pseudocyst and pleural effusion (Fig. 3B). Currently, 7 months since the stenting, he has been doing well without any sign of recurrence of any of the symptoms and is planned to undergo regular stent changes.

DISCUSSION

Pancreatic pseudocysts have been reported in patients ranging from 7 months to 73 years of age. Patients under 20 years of age and patients in the fourth decade of life are the two predominant age groups. The most common cause of pancreatic pseudocysts is alcoholic pancreatitis (75-90%) in adults and trauma in children.^{7,8} Lewis, et al. reported an up to 20% occurrence of pancreatic pseudocyst following pancreatic injury.⁹ Pancreatic pseudocysts are classified as either the acute type caused by acute pancreatitis or exacerbated from chronic pancreatitis, or chronic type caused

by chronic pancreatitis.^{10,11} In our patient, the pseudocyst was regarded as being the acute type because the symptoms and laboratory findings suggested an acute exacerbation of preexisting chronic alcoholic pancreatitis.

A patient with a pancreatic pseudocyst in the mediastinum was reported in 1944,¹² and a review of the literature indicates that less than 50 cases have been reported. Since the most common route into the chest is through the esophageal or aortic diaphragmatic hiatus, the vast majority of thoracic pseudocysts are found in the posterior mediastinum.



Fig. 2. Two plastic stents inserted into the pancreatic and biliary duct.

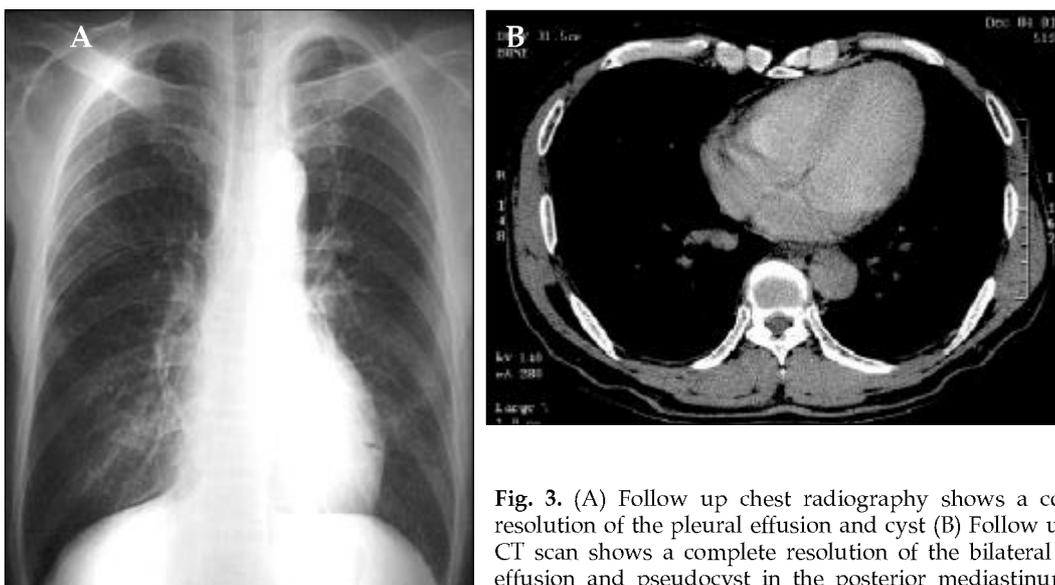


Fig. 3. (A) Follow up chest radiography shows a complete resolution of the pleural effusion and cyst (B) Follow up chest CT scan shows a complete resolution of the bilateral pleural effusion and pseudocyst in the posterior mediastinum.

However, anterior mediastinal pseudocysts can occur from an extension through the foramen of Morgagni, and middle mediastinal pseudocysts through a diaphragmatic erosion or an inferior vena cava hiatus.^{2,13}

There has been several treatment modalities used for mediastinal pancreatic pseudocysts including conservative, medical treatments such as somatostatin or its analogs and octreotide, external or internal drainage, endoscopic stenting, and surgery. The spontaneous resolution of mediastinal pseudocysts is rare. As a mediastinal pancreatic pseudocyst is resistant to medical treatment and is likely to cause critical pulmonary complications, the appropriate surgical or interventional treatment should be performed.¹⁴

Although percutaneous drainage is less invasive and has a lower mortality compared to surgery, there is considerable risk of complications such as a catheter obstruction by thick pancreatic debris, infection, and fistula formation. The surgical treatment for pancreatic pseudocysts has traditionally been drainage by means of the creation of large cystenterostomies using an open surgical approach. This is major procedure with definite morbidity and mortality. More recently, a combined laparoendoscopic cystgastrostomy has been introduced as a less invasive treatment option than major surgery.¹⁵

Some authors¹⁶ reported the successful drainage of a traumatic pancreatic pseudocyst, performed with a side viewing duodenoscope and a needle knife papillotome. Mallavarapu, et al.² report two cases of mediastinal pancreatic pseudocysts that were successfully treated with a transpapillary stent placement. To the best of our knowledge, this is the third case of a mediastinal pancreatic pseudocyst reported that was successfully treated with a transpapillary stent placement. Less invasive procedures are more favorable particularly for poor surgical candidates. Complications of a transpapillary placement of pancreatic ductal stent are a worsening of the acute pancreatitis, a stent occlusion, and a migration of the stent, infection of a pseudocyst, ductal stricture, and duodenal erosion.^{4,17}

In our case, because a forceful dye injection was avoided, which can aggravate the acute pancreatitis or result in a pseudocyst infection from dye

filling, we could not document the tract between the mediastinal pseudocyst and the pancreatic duct. However, it was assumed there was the presence communication, because a pseudocyst at a distant site from pancreas occurs per se by a collection of leaked pancreatic juice. This was evident from the findings suggesting that the clinical course was very favorable that the symptoms of acute pancreatitis and pseudocyst were rapidly resolved. This was due to the critical stricture at downstream pancreatic duct, which obstructed the stream of pancreatic juice. Therefore, among the patients with acute pancreatitis complicated by pseudocysts, cases where the pancreatic duct is obstructed either by a stricture or a stone can be an ideal indication of pancreatic stenting. This assumption was extrapolated to the patients with severe pain related to the chronic pancreatitis in that the pancreatic stenting effectively relieves the pain when the pancreatogram shows a downstream stricture with an upstream dilation.

In conclusion, an endoscopic transpapillary stent placement appears to be a feasible option for managing mediastinal pancreatic pseudocysts.

REFERENCES

1. Bradley EL. A clinically based classification system for acute pancreatitis: summary of the International Symposium on Acute Pancreatitis, Atlanta, GA, September 11 through 13, 1992. *Arch Surg* 1993;128:586-90.
2. Mallavarapu R, Habib TH, Elton E, Goldberg MJ. Resolution of mediastinal pancreatic pseudocysts with transpapillary stent placement. *Gastrointest Endosc* 2001; 53:367-70.
3. Kiil J, Ronning H. Pancreatic fistula cured by an endoprosthesis in the pancreatic duct. *Br J Surg* 1993; 80:1316-7.
4. Kozarek RA, Ball TJ, Patterson DJ, Freeny PC, Ryan JA, Traverso LW. Endoscopic transpapillary therapy for disrupted pancreatic duct and peripancreatic fluid collections. *Gastroenterology* 1991;100:1362-70.
5. Saeed ZA, Ramirez FC, Hepps KS. Endoscopic stent placement for internal and external pancreatic fistulas. *Gastroenterology* 1993;105:1213-7.
6. Hamalainen KP, Halme L, Tierala E. Endoscopically inserted stent as treatment for pancreatic ascites. A case report. *Acta Radiol* 1997;38:550-2.
7. Johnston RH Jr, Owensby LC, Vargas GM, Garcia-Rinaldi R. Pancreatic pseudocyst of the mediastinum.

- Ann Thorac Surg 1986;41:210-2.
8. Frenzer A, Schubarth P, Soucek M, Krahenbuhl S. Disappearance of a large mediastinal pseudocyst in a patient with chronic alcoholic pancreatitis after total parenteral nutrition. *Eur J Gastroenterol Hepatol* 1995; 7:369-71.
 9. Lewis G, Krige JE, Bornman PC, Terblanche J. Traumatic pancreatic pseudocysts. *Br J Surg* 1993;80:89-93.
 10. Crass RA, Way LW. Acute and chronic pancreatic pseudocysts are different. *Am J Surg* 1981;142:660-3.
 11. Kloppel G, Maillet B. Pathology of acute and chronic pancreatitis. *Pancreas* 1993;8:659-70.
 12. Jones ES. Pancreatic cysts with report of two unusual cases. *J Indian State Med Assoc* 1944;37:175-6.
 13. Zeilender S, Turner MA, Glauser FL. Mediastinal pseudocyst associated with chronic pleural effusions. *Chest* 1990;98:1014-6.
 14. Tanaka A, Takeda R, Utsunomiya H, Kataoka M, Mukaiharu S, Hayakawa K. Severe complications of mediastinal pancreatic pseudocyst: report of esophagobronchial fistula and hemothorax. *J Hepatobiliary Pancreat Surg* 2000;7:86-91.
 15. Libby ED, Taylor J, Mysh D, Schwaitzberg SD. Combined laparoendoscopic cystgastrostomy. *Gastrointest Endosc* 1999;50:416-9.
 16. Funnell IC, Bornman PC, Krige JE, Beningfield SJ, Terblanche J. Endoscopic drainage of traumatic pancreatic pseudocyst. *Br J Surg* 1994;81:879-81.
 17. Levy RD, Degiannis E, Saadia R. The management of internal pancreatic fistula-a collective review. *S Afr J Surg* 1996;34:175-7.