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Case Report

Necrotizing Pancreatitis with Mediastinal Abscess Formation

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Abstract

Mediastinal abscess formation is a rare thoracic complication of acute pancreatitis with a high mortality. Pleural effusion and pneumonia represent the most frequent complications. Here we report the case of a 52 years old patient with a history of alcohol-induced acute pancreatitis, who was admitted at our hospital with acute abdominal pain. Contrast-enhanced Computed Tomography showed a necrotizing pancreatitis with mediastinal abscess formation. Endosonographic puncture and subsequent placement of a transesophageal pigtail drainage in the necrotic cavity led to complete evacuation of the infected mediastinal necrosis. To our knowledge this therapeutic approach has not been described for such a case before and seems to be an effective therapy of mediastinal abscess formation.

Keywords: Mediastinal abscess formation; necrotizing pancreatitis

Introduction

Necrotizing pancreatitis (NP) is a severe complication of acute pancreatitis (AP) with high mortality and morbidity rates up to 27% [1]. The main cause of death is the infection of the necrotic tissue, which is associated with poor prognosis [2]. Mortality is approximately 15% in patients with necrotizing pancreatitis and in cases with infected necrosis up to 30-39% [3-5]. Mediastinal necrosis is a rare complication of AP and only few cases have been reported until now [6-8]. The common thoracic complications of AP are pleural effusions and pneumonia [9,10]. Some reported rare complications include cardiac tamponade [11,12], pancreaticopleural fistula with recurrent pleural effusion, hemothorax or mediastinitis [13-15] and mediastinal pseudocyst with pneumonia [16-18]. In this case, we report a patient with mediastinal abscess formation, a rare complication of AP which was treated successfully with endoscopic placement of a transesophageal pigtail drainage in the necrotic cavity. Using per oral endosonographic the abscess formation was clearly located and measured. Afterwards puncture was performed with a special puncture needle (Giovannini Needle Wire Oasis, FA Cook) and the tract was subsequently dilated (Hurricane balloon catheter) up to 6 mm. Thereafter a 10 Fr double-pigtail drainage was placed under fluoroscopic control. The pigtail catheter drained the abscess from the abscess cavity into the esophagus, leading to a complete evacuation of the mediastinal abscess formation [19-21].

Case Report

A 52 years old patient with a history of alcohol-induced necrotizing pancreatitis previously diagnosed with Contrast-enhanced Computed Tomography (CECT) scan and treated conservatively at the Department of Internal Medicine of our university hospital was admitted in January 2016 at our emergency department with acute abdominal pain. Two weeks before the patient was discharged from hospital after being conservatively treated by the above clinical diagnosis. Clinical examination suggested no thoracic complication, but a recurrence of acute necrotizing pancreatitis confirmed with laboratory values and CECT scan (Figures 1a & 1b) [22-25].

Figure 1a: CECT revealed a walled-off-pancreatic necrosis, a rare complication of acute pancreatitis which often results to formation of pancreaspseudocyst or peripancreatic fluid collection.

Figure 1b: Chest-CT revealed no pleural effusion or mediastinal fluid collection.

Figure 2: CECT showed progress of necrotizing pancreatitis with increased volume of the peripancreatic fluid collections.

The pre-existing medical history of the patient was: gastritis, steatosis hepatis, status post myocardial infarcted 2005 and 2010, arterial hypertonia and hyperlipoproteinemia. Blood chemistry on admission showed increased levels of leucocytes (22.6 x 1000/µl), C-reactive protein (CRP; 31.6mg/dl) and serum amylase (679U/L). Other laboratory values such as serum calcium, potassium, sodium, urea, amylase in urine and liver values were normal. The patient was admitted at our intermediate care unit (ICU), where the patient´s condition significantly improved after about one month of conservative therapy with antibiotics, analgesia and intravenous fluid substitution. One month later during clinical course the patient suddenly developed fever, acute abdominal pain, dyspnea and high levels of leucocytes. CECT-scan showed a progression of the necrotizing pancreatitis with increased volume of the peripancreatic fluid collection as well as ascites (Figure 2) [26-29]. In addition, bilateral pleural effusions became evident (Figure 3).

Figure 3: Chest-CT revealed pleural effusion on both sides.

Because of the high risk of bowel perforation, image-guided percutaneous catheter drainage of the necrotic peripancreatic fluid collection was not performed. Instead a trans gastral drainage was established via endosonographic puncture, subsequent dilatation and placement of three pigtail catheters into the necrotic cavity (Figure 4) resulting in a enough draining of the fluid. The pleural effusions were drained by chest tube insertion. Laboratory analysis of the pleural effusion showed normal levels of serum amylase. After this intervention, the condition of the patient improved fast and after a few days of intensive care treatment the patient was transferred to the normal hospital ward. To further evaluate the structure of the pancreatic duct, a magnetic resonance cholangiopancreatography (MRCP) was performed, showing a large pseudocyst along the pancreatic tail but no pancreatic pleural fistula or stone in the pancreatic duct (Figure 5) [30-34].

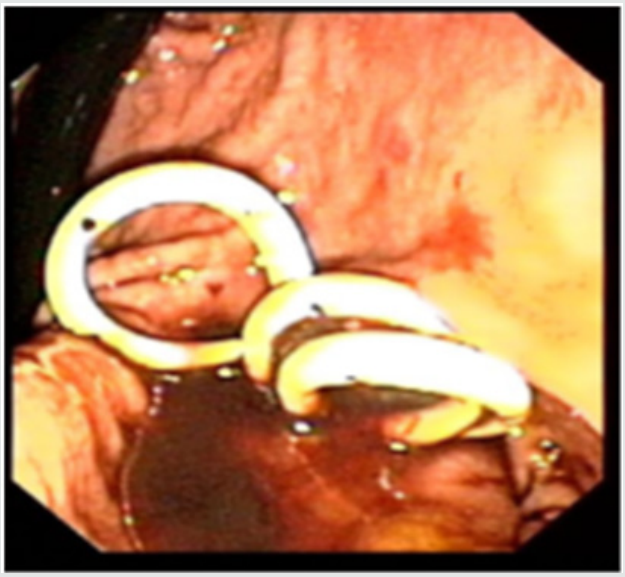

Figure 4: After puncture of the necrotic peripancreatic fluid collection with placement of 3 double-pigtail catheters.

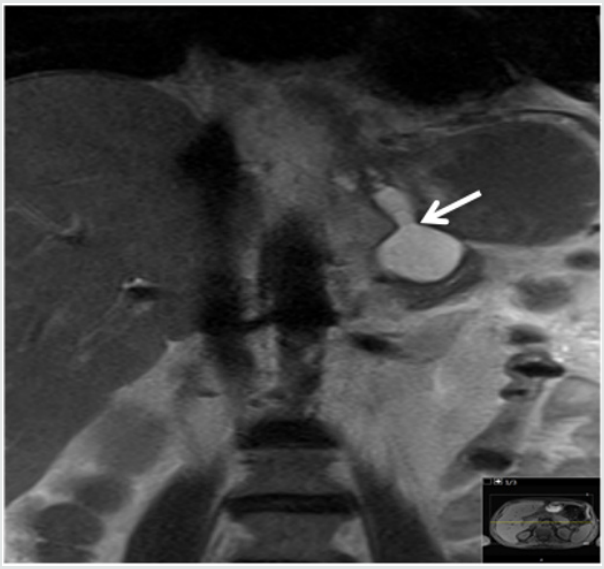

Figure 5: MRCP revealed no pancreaticopleural fistula. A pancrespseudocyst was detected along the pancreatic tail.

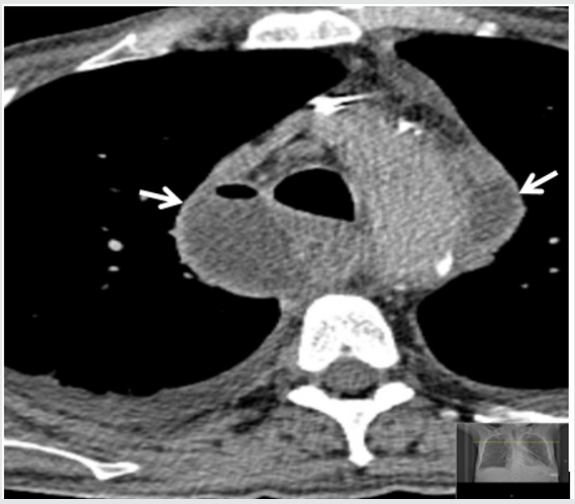

Figure 6: Chest CT scan shows mediastinal abscess with trapped air adjacent to the esophagus (arrow on the right side) and aortic arch (arrow on the left side).

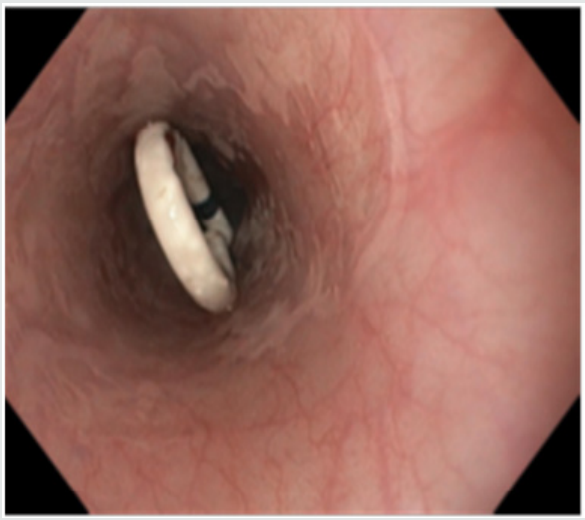

Figure 7: Intraluminal position of the pigtail drainage after placement in the necrotic cavity.

Five weeks later, the patient suddenly developed acute thoracic pain, dyspnea, fever and hypertensive crisis. Blood level of leucocytes and CRP were also elevated. The immediately performed CECT displayed a posterior mediastinal abscess formation with supra-carinal location as cause of the patients deteriorating condition. Because of persisting thoracic pain, dyspnea and hemodynamic instability, the patient was again transferred to the intermediate care unit, where antibiotics, analgesia und controlled fluid substitution was applied (Figure 6). Based on the unsuitable abscess localization in the posterior mediastinum, CT-guided percutaneous drainage placement could not be performed safely. In addition, by using this route there was a risk of bacterial contamination of the pleural space. Thus, we decided to perform a per-oral endoscopy with transesophageal puncture accompanied by simultaneous placement of a double-pigtail drainage in the necrotic cavity (Figures 7 & 8).

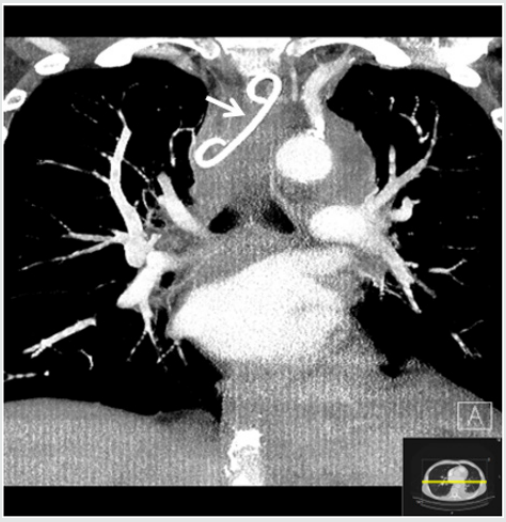

Figure 8: Maximum intensity projection CT imaging shows the position of pigtail drainage in the thoracic cavity.

One day after the intervention, the patient´s clinical condition significantly improved. During the following days, the clinical symptoms were relieved and blood leucocytes normalized. The follow-up CT scan during the clinical course after intervention, suggested a significant regression of the mediastinal (Figure 9) as well as of the peripancreatic and abdominal necrosis. After the intervention, the patient's situation stabilized with no relapse since then. The trans gastral und transesophageal pigtail drainages were removed after CT scan control one month later without any additional complication. The Barium swallow examination showed no pathologic results. The patient was then enterally fed and remained under observation in our clinic.

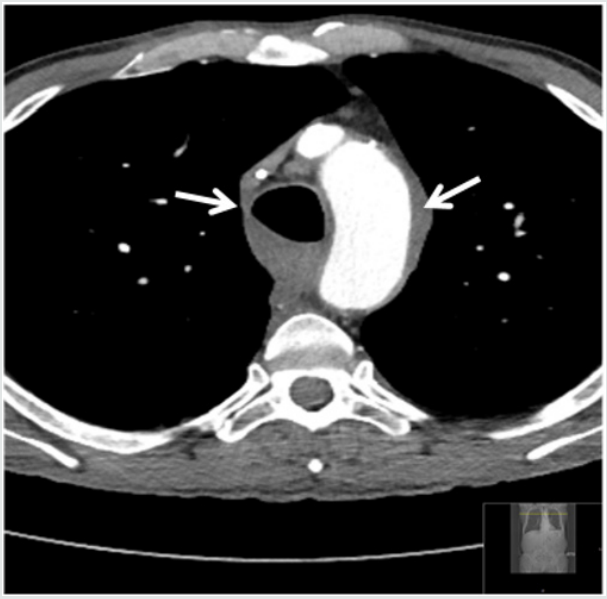

Figure 9: Follow-up Chest CT after removing the transesophageal pigtail showed almost complete necrosectomy of the mediastinal abscess. Pleural effusion also completely decreased on both sides.

Discussion

Mediastinal abscess formation is a rare thoracic complication of acute pancreatitis and only a few cases have been reported till now [6-8]. The common thoracic complications of AP are pleural effusions and pneumonia [9,10]. In the most cases patients died before or at time of diagnosis. To date less is known about the therapeutic options at time of diagnosis. Related to other illnesses with mediastinal abscess formation such as Berhane's syndrome or anastomosis leak after esophagectomy, minimal invasive techniques such as video-assisted thoracoscopy, CT-guided percutaneous drainage, cervical drainage and transesophageal endoscopic ultrasound (EUS) have been described as effective management strategies in these cases [30,31,32,33]. The mechanism of pleural effusion and abscess formation is unknown, but some theories have been reported. Fistolous communication between a pancreatic pseudocyst and the pleural space due to pancreatic pleural fistula, lymphatic transportation of amylase [27] and circulating enzymes [28,29] belong to the most common theories for pleural effusion formation. In our case, no pancreatic pleural fistula was detected in the MRCP. Normal levels of amylase in the pleural effusion also foreclosed the existence of a fistula.

The most used approach to infected pancreatic necrosis has been open surgical necrosectomy, but it is associated with high morbidity (34-95%) and mortality (11-39%), due to physical stress of the laparatomic debridment [19-22]. In the last two decades, treatment of necrotizing pancreatitis has evolved and emerged from invasive to less invasive techniques such as laparoscopy [23], interventional radiology [24-25] and endoscopy [26]. These methods are nowadays alternatives or complimentary approaches to surgical necrosectomy and may substitute or delay surgical intervention. Here we report the case of a patient with necrotizing pancreatitis who developed mediastinal abscess formation. However, image-guided percutaneous catheter drainage (PCD), which is the first step approach (in the step-up approach) to drain necrotic collections before endoscopic debridement or surgery are considered [22] was not implemented because of unfavorable supra-carinal abscess localization at the posterior mediastinum. Thus, the patient was successfully treated with per-oral transesophageal endoscopic necrosectomy.

Follow-up CT scan showed a regression of the mediastinal abscess and served as therapy control till the double-pigtail drainage was removed. After removal of the drainage, a barium swallow examination of the upper gastrointestinal tract did not show any leakage or fistula of the esophagus, which are possible complications after removal of a pigtail drainage. Likewise, other potential complications, which could emerge from endosonographic puncture and placement of a pigtail drainage such as injury of neighboring organs (e.g. the aortic arch or trachea) or dislocation of the pigtail drainage did not occur. Therefore analogous to the well-known endoscopic trans gastral necrosectomy, which is also used to relieve infected peripancreatic or pancreatic necrosis, endoscopic transesophageal necrosectomy may also represent an effective therapy for patients with infected supra-carinal mediastinal fluid collection or abscess at time of diagnosis. In summary these data suggest that endosonographic guided placement of transesophageal drainage is enough to adequately manage mediastinal abscess formation due to necrotizing pancreatitis. This approach requires a multidisciplinary approach in specialized centers with a high expertise in interventional endoscopy and a good intensive care unit.

Author contributions

Fung SN. designed and wrote the report, analyzed and interpreted the data; S. Vaghiri and Rehders A were attending doctors of the patient; Bode J. performed the transesophageal puncture; Sawicki L.M analyzed the CT scans; Krieg A, Rehders A. and Knoefel WT critically revised the report and gave important intellectual input.

Institutional review board statement: The study was reviewed and approved by the Independent Research Ethics Committe at the Medical Faculty of the Heinrich-Heine-University of Duesseldorf (Study No. 6128)

Informed consent statement: The study participant provided informed written consent prior to study enrollment

Core tip Mediastinal abscess formation is a rare thoracic complication of acute pancreatitis. This case reports a patient with mediastinal abscess formation due to necrotizing pancreatitis who was successfully treated with endosonographic puncture and subsequent placement of a transesophageal pigtail drainage in the necrotic cavity. Fung SN, Vaghiri S, Bode JG, Sawicki LM, Krieg A, , Rehder A, Knoefel WT. Necrotizing pancreatitis with mediastinal abscess formation

Conflict of Interest

There is no conflict-of-interest between authors.

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