

squamous mucosa to various types of physical, chemical, thermal, immunological or ischemic insults.⁵ Symptoms of EDS can be non-specific or frequently absent. Dysphagia, gastrointestinal bleeding, abdominal pain, heartburn and odynophagia have all been reported in decreasing order of frequency.⁶ Endoscopic features of EDS can be patchy or diffuse in the form of white plaques of stripped-off mucosa, which may look like an opaque or translucent membrane, with or without bleeding, vertical fissures and circumferential cracks. The location of the lesions, as reported, was 42% in the distal esophagus, 23% in the entire esophagus, 19% in the middle esophagus and 8% in the proximal esophagus.⁶ Biopsy from the confirmed cases shows prominent parakeratosis, orthokeratosis, desquamation of the squamous layers and variable degree of acute or chronic inflammation. There may be an eosinophilic superficial zone with pyknotic or necrotic nuclei and a normal looking basal zone giving rise to a two-toned appearance.⁶ There is separation of layers where the basal layers appear viable while the superficial ones slough off and look mummified. In spite of its dramatic presentation at times, EDS resolves spontaneously and completely. A combination of acid suppression and discontinuation of any precipitating drug have been reported to heal the lesions. EDS is a benign condition with an excellent prognosis, which resolves without lasting esophageal pathology because of the superficial nature of the lesions.

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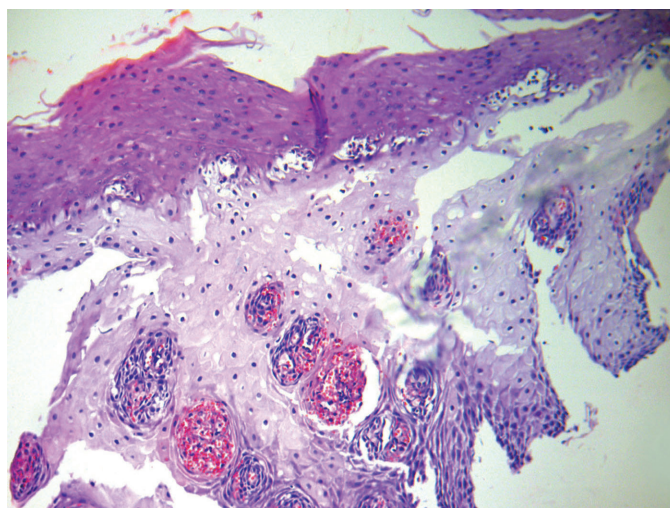


Figure 2: Esophageal biopsy showing lining squamous epithelium with sloughing, foci of orthokeratosis, parakeratosis and bullous separation of layers with varying degree of inflammation H&E stain x100.

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Non-fluoroscopic endoscopic ultrasound guided drainage of emphysematous pancreatic fluid collection

Drainage of pancreatic fluid collections (PFC's) is indicated in symptomatic cases. This may be due to infection or due to obstructive symptoms resulting from gastric outlet or biliary obstruction.¹ Endoscopic

ultrasound (EUS) guided drainage has emerged as the preferred treatment strategy of PFC's due to high technical and clinical success as well as better safety profile.²⁻⁴ However, presence of air in the collection makes EUS guided drainage difficult. This is because visibility on EUS is compromised by the presence of reflective air in the collection and in this situation, fluoroscopy is needed to see the guide wire properly. We report a case of successful EUS guided drainage of an emphysematous pancreatic collection which had air due to previous percutaneous drainage. We also describe the modifications of the technique of non-fluoroscopic EUS guided drainage of PFC's for the same.

Case Report

A 47 year old male presented with high grade of fever for a duration of 4 days. He had an episode of gall stone related acute necrotizing pancreatitis ten weeks ago, which had followed a complicated course with acute kidney injury and acute lung injury necessitating intensive care unit (ICU) care. Subsequently, he had developed a pancreatic infected acute necrotic collection that was being treated with percutaneous catheter (PCD) drainage and intravenous antibiotics. With PCD, his fever had subsided but the drain output continued to be more than 200 ml/day of purulent material. The PCD output had suddenly reduced to almost nil over the last four days and he developed high grade fever, abdominal pain and leucocytosis. Contrast enhanced computed tomography (CECT) revealed that the percutaneous catheter had slipped out of the collection (**Figure 1**). The collection measured 8 cm, had a well formed wall and lots of air because of prior intervention (**Figure 2**). After an informed consent, the patient was taken up for EUS guided drainage of the collection. The collection was assessed from the stomach using a linear echoendoscope. The visibility was compromised due to presence of extensive air inside the collection (**Figure 3**). The collection was punctured using a 19 G EUS-Fine needle aspiration (FNA) needle under real time EUS guidance (**Figure 4**). The position of the needle was confirmed under EUS guidance as well as by aspirating purulent content from the collection. Thereafter, a 0.035 inch guide wire (Jagwire, Boston Scientific India



Figure 1: CECT: displaced PCD catheter.

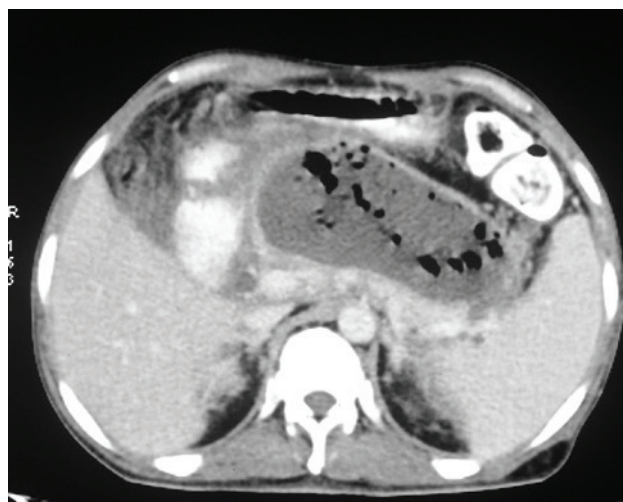


Figure 2: CECT: large walled off pancreatic necrosis with air foci.



Figure 3: EUS: poorly visualized collection due to echo reflections because of air.



Figure 4: Collection punctured using a 19 G EUS-Fine needle aspiration (FNA) needle.

Pvt. Ltd., Gurgaon, India) was coiled inside the cavity. Because of poor visibility on EUS, the guide wire was pushed very slowly, and once the tip of the guide wire was seen exiting the needle tip, only 10 cm of the guide wire was pushed further. As the guide wire was not seen properly under EUS, the subsequent steps were done under endoscopic guidance. Keeping the guide wire fixed with the elevator of the echoendoscope, the transmural tract was dilated sequentially using a 4 mm biliary balloon dilator followed by a Controlled Radial Expansion (CRE) balloon till a diameter of 15 mm was achieved. This was followed by placement of a nasocystic drainage catheter. The advantage of placing a nasocystic catheter in this situation was that it could be placed without fluoroscopy and the thick purulent contents could be actively aspirated out with ease (**Figure 5**). The patient showed marked symptomatic improvement. The nasocystic catheter was later exchanged with multiple 10 Fr double pigtailed stents. Follow up CECT revealed reduction in the size of the collection (**Figure 6**). The patient was discharged with indwelling stents.

Discussion

The rates of technical success appear to improve with the use of EUS guided drainage vis-à-vis direct endoscopic puncture of the cyst.² However, presence of air or calcification in the collection can make EUS guided drainage difficult. This is because the air reflects the ultrasound beam and creates shadows in the collection



Figure 5: X Ray: Nasocystic catheter in situ; Displaced pigtail catheter is also seen.



Figure 6: CECT: Collection has reduced in size. Multiple transmural stents are also seen.

making visualisation of accessories like the needle tip and the guide wire difficult. In fact, even PCD in the presence of air in the collection is done under CT guidance and not under ultrasound guidance because of poor visualisation. We have previously reported the use of EUS guided drainage to treat a calcified pseudocyst.⁵ Calcification also reflects the ultrasound beam making the visualisation of structures beyond the calcification difficult. However, on EUS once a window without calcification is detected the procedure becomes easier as this echo free window can be used to see the accessories. However, in emphysematous collections, there are multiple reflective air foci throughout the collection making the EUS guided drainage without

fluoroscopy very difficult. The coiling of the guide wire into the collection becomes the most critical step, as without fluoroscopic or EUS guidance there is a risk of perforation of the cyst wall. To prevent this complication, we pushed the guide wire in slowly and ensured that once the tip of the guide wire was seen exiting the needle tip, only 10 cm of the guide wire was pushed further.

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