Endoscopic Ultrasound Guided Pancreaticogastrostomy for Pancreatic Pleural Effusion

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Pancreatic pleural effusion (PPE) is a rare complication of acute as well as chronic pancreatitis and occurs due to formation of internal pancreatic fistula consequent to pancreatic duct disruption.[1-3] The traditional management of PPE has been prolonged conservative medical therapy involving fasting, parenteral nutrition, somatostatin or its analogues, and repeated large-volume thoracentesis or surgery.[1] A safe, minimally invasive, and effective treatment alternative is endoscopic transpapillary stent or nasopancreatic drain (NPD) placement. This endoprosthesis placement leads to the creation of a drainage path of lesser resistance that diverts the pancreatic juice through the papillary orifice into the duodenum rather than through pancreatic duct (PD) disruption.[1-5] Endoscopic transpapillary drainage is effective and leads on to the resolution of internal pancreatic fistula if the ductal disruption is partial and can be bridged with an endoprosthesis. Patients of PPE with complete duct obstruction or disconnection and in whom endoscopic transpapillary placement of endoprosthesis across the obstruction/disruption is not possible are more challenging to manage and usually require surgery.[1] However, with the availability of endoscopic ultrasound (EUS), the PD of patients with disconnection/complete obstruction can also be drained endoscopically. EUS-guided pancreatic duct drainage (EUS-PD) is an upcoming and exciting minimally invasive treatment option for pancreatic duct drainage in patients with failed endoscopic retrograde cholangiopancreatography (ERCP).[6] Here, we report a case of chronic calcific pancreatitis with right PPE and completely obstructed pancreatic duct in the head of the pancreas, which was successfully treated with EUS guided pancreaticogastrostomy.

Case Report

A 46-year-old male, chronic alcoholic, presented with breathlessness of 2 weeks duration. It was associated with abdominal pain of 3 months duration. Computed tomography (CT) revealed a massive right-sided pleural effusion (**Figure 1**), dilated pancreatic duct (PD) in the body, and tail with large ductal calculi in the head of the pancreas. A pigtail catheter was placed in the pleural cavity, and it drained amylase rich exudative fluid. Endoscopic retrograde cholangiopancreatography revealed a tight stricture/stone complex at head of the pancreas beyond which neither contrast nor guidewire could be negotiated. As the patient continued to drain >300 ml/day of pleural fluid, endoscopic ultrasound (EUS) guided pancreatico-gastrostomy (PG) was planned. Under EUS guidance, dilated PD in the body was punctured with a 19 G needle and pancreatogram obtained. The PD was dilated with complete cut off at head body junction (**Figure 2**; black arrow) with disruption at the level of the body. The contrast could be seen as extravasating towards mediastinum (**Figure 2**; white arrows). A 5 Fr, 5 cm stent, was placed into PD through the stomach after dilating the transmural tract with a 6 Fr cystotome. Catheter drainage subsided gradually, and CT revealed resolution of pleural effusion (**Figure 3**). The PG stent was seen in place decompressing the dilated PD (**Figure 3 and 4**). The percutaneous pigtail catheter was removed. The patient is asymptomatic after a follow up of 2 months.

Figure 1: Computed tomography (CT): massive right-sided pleural effusion.

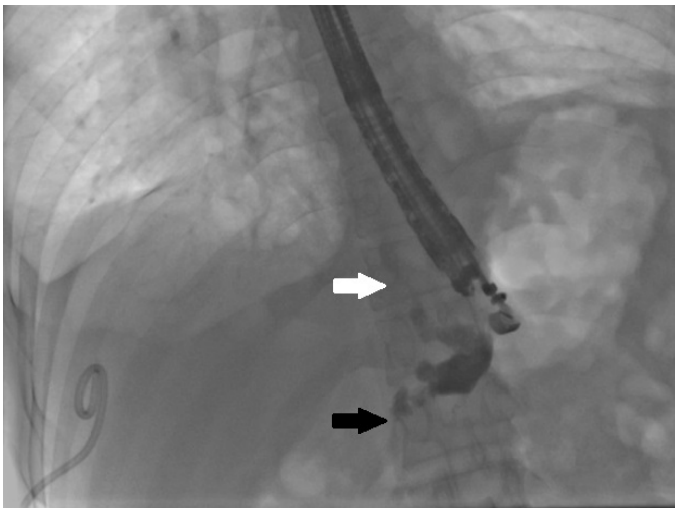

Figure 2: EUS pancreatogram: The PD is dilated with complete cut off at head body junction (black arrow) with disruption at the level of the body. The contrast could be seen as extravasating towards mediastinum (white arrows).

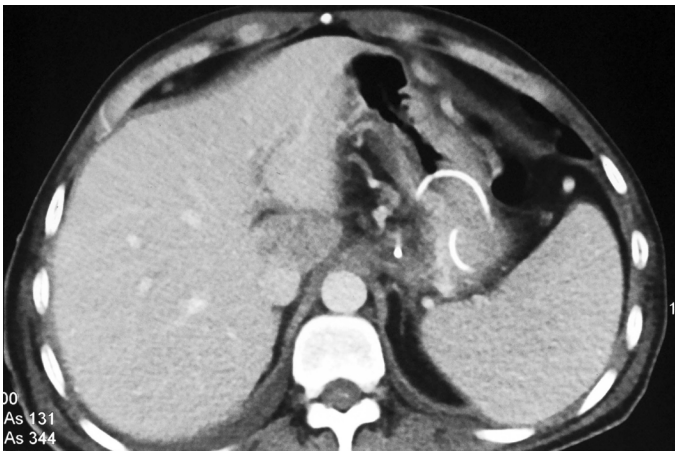

Figure 3: CT: The resolution of pleural effusion and pancreatico-gastrostomy (PG) stent seen in the stomach.

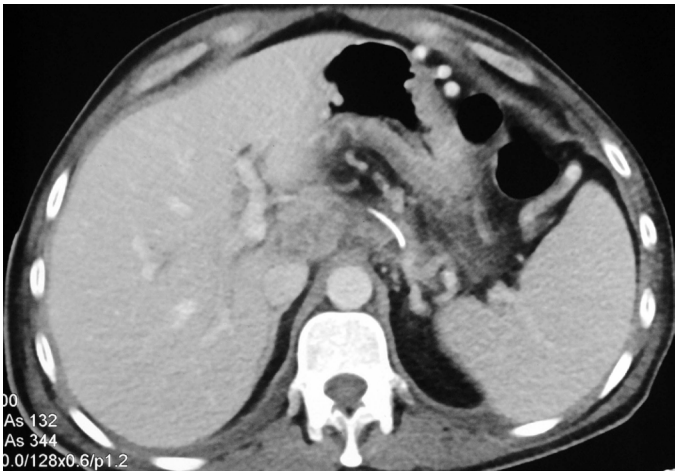

Figure 4: The PG stent is seen in the dilated PD decompressing it.

Discussion

EUS guided pancreatic duct drainage is an exciting and challenging interventional procedure that can be done in patients in whom the pancreatic duct cannot be accessed at endoscopic retrograde cholangiopancreatography (ERCP) because of anatomical or technical reasons.[6] EUS-guided drainage of the PD can be done by either using the EUS-guided rendezvous technique or using EUS-guided direct PD stenting.[6,7] EUS-PD direct stenting is the more difficult and challenging procedure as it requires dilation of the needle tract followed by placement of stent through the transmural tract that can lead to serious complications like pancreatitis, pancreatic juice leakage, bleeding, and perforation in up to 40% patients.[6,7]

EUS guided direct PD stenting has been previously reported for treatment of chronic pain in both

benign and malignant PD obstruction but has not been reported for treatment of pancreatic pleural effusion, as was done in the index case.[6-10] Although EUS guided PD drainage looks very exciting and promising, it is one of the most challenging procedures of interventional EUS. This is because of the lack of dedicated accessories, small diameter of the pancreatic duct leading on to limited space to maneuver, unstable echoendoscope in the large stomach leading on to frequent slippage of wire/accessories, and the lack of adherence of pancreas to stomach leading to movement with respiration causing technical problems.[11] These problems are compounded by the lack of a dedicated ideal PG stent. Various designs of plastic stents, as well as fully covered self-expanding metallic stents, have been evaluated for EUS PD, but the ideal stent is yet to be made.[11,12]

In conclusion, PPE with disconnected/completely obstructed PD can be treated endoscopically using EUS guided PD drainage, and it seems to be safe and effective. However, this procedure should be performed in expert centers with interventional radiology and surgery back up.

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