Case Report

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Successful ERCP for management of traumatic pancreatic disruption in a patient with situs inversus

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Summary **Endoscopic retrograde cholangio-pancreatography (ERCP) is an important tool for treatment of pancreaticobiliary diseases. However, ERCP may be difficult in patients who have altered gastrointestinal anatomy due to congenital or surgical reasons. A 40-year-old male with HIV infection presented with abdominal pain following abdominal trauma. The patient was diagnosed to have traumatic pancreatic injury and underlying situs inversus. The pancreatic fluid collection was drained using radiology guided pigtail placement done for the symptoms of abdominal pain and vomiting. The resulting external pancreatic fistula was successfully managed with ERCP and stenting. The patient improved with disappearance of ascites and resolution of pigtail output which was then removed. We report the technique used for ERCP in this patient. We also review the literature on pancreatic endotherapy in patients with situs inversus. The published literature suggests that with modifications in the standard ERCP technique like mirror image technique, 180 degree turn technique, left lateral technique *etc*. these patients can be managed successfully.**

Keywords: Pancreatic trauma, pancreatic stent, fistula, situs inversus, ERCP, endoscopy

1. Introduction

Situs inversus viscerum (SIV) is a rare, autosomal recessive genetic abnormality characterised by a left to right transposition of all viscera thereby resembling a mirror image of the usual pattern (*1*). In a complete SIV, there is total transposition of all viscera and dextroversion of the heart. Endoscopic retrograde cholangiopancreatography (ERCP) is a widely used procedure for intervention in pancreatic and biliary tree for various benign and malignant conditions like choledocholithiasis, chronic pancreatitis and malignant extrahepatic biliary obstruction but may not be successful (*2-4*). Very few reports of endoscopic retrograde pancreatography in patients with SIV have been described in the published literature (*5,6*). We report here a case of acute pancreatitis with duct disruption due to trauma and external pancreatic fistula in a patient of SIV which was successfully managed with ERCP.

2. Case Report

A 40-year-old gentleman who was under treatment for human immunodeficiency virus (HIV) infection with highly active anti-retroviral therapy presented with road traffic accident resulting in a fall from a bicycle followed by abdominal pain. He was admitted in March 2017 and the investigations revealed haemoglobin of 14 gm%, total leucocyte count of 18,000 per cubic mm. Liver and renal function tests were within normal limits. Serum amylase and lipase were 3,400 IU/mL and 4,500 IU/mL respectively. Abdominal computed tomography was done for the patient which showed presence of situs inversus with liver to the left and spleen to the right and evidence of pancreatic duct disruption in the head-body junction and presence of fluid collection anterior to the pancreas (Figure 1). The patient underwent percutaneous ultrasound guided pigtail for pain abdomen, fever and vomiting and was discharged after these symptoms settled. However, the patient continued to have a persistent pigtail output

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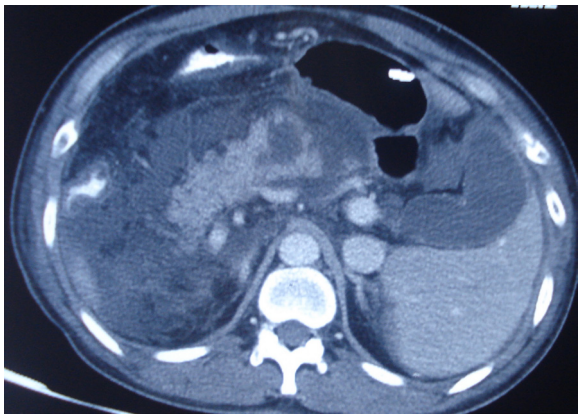

Figure 1. Computed tomography showing situs inversus with pancreatic disruption and fluid collection.

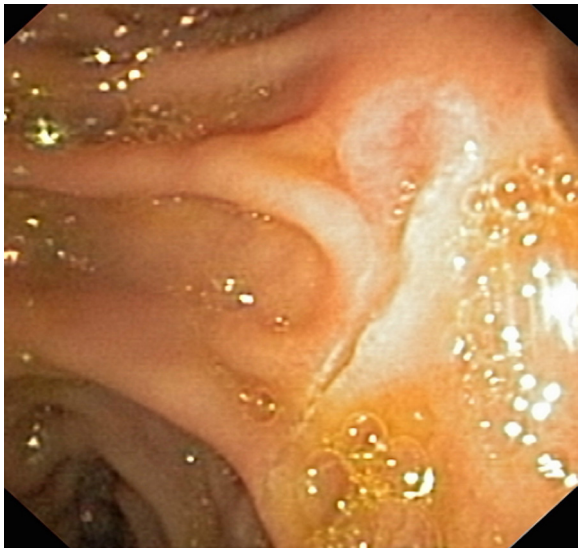

Figure 2. Endoscopic image of the papilla in the patient.

of 150 to 200 mL/day even a month after the onset of symptoms. At this time, an ERCP was performed for the patient. The procedure was done with the patient in the usual prone position and scope also in the usual position. The scope movements were made in the direction opposite to the usual. After entering the stomach, the scope tip was turned up and stomach insufflated to see the stomach folds and scope was moved to the antrum in this forward viewing position. The duodenum was intubated as usual by keeping the pylorus in setting-sun position and once in first part of duodenum the scope was turned by moving the hand counter-clockwise and turning the scope tip down the junction of D1 and D2 was seen. Now the scope was pushed into second part of duodenum. Further the papilla was brought in the front by moving the right-left knob of the scope to the left and withdrawing the scope (Figure 2). The cannulation of the pancreatic duct was then done by attempting to push the guidewire into the left side of the papilla which is usually the direction of the bile duct. The pancreatogram showed evidence of complete ductal disruption at the neck of the pancreas

Figure 3. Pancreatogram showing duct disruption in the region of pancreatic neck.

and a 5 Fr stent was placed into the disruption (Figure 3). After ERCP, drain output decreased over the next week. Two weeks later, the pigtail catheter was removed. At 2 months of follow-up the patient is doing well and free of symptoms and the ultrasound showed resolution of the collection.

3. Discussion

The index case describes ERCP involving pancreatic system with successful endotherapy. While most of the literature describes use of this procedure in patients with biliary pathology, most common being choledocholithiasis; and there are very few reports of ERCP in patients with SIV in literature (*2,4,7*). However, to the best of our knowledge, there are only two reports describing pancreatic ERCP in patients with SIV (*5,6*). Chowdhury *et al* described the procedure in a patient with chronic calcific pancreatitis with pseudocyst. They described the difficulties faced and the modification maneuverers required for doing the procedure (*5*). Another case was described by Bichard *et al*, a patient with Chronic pancreatitis associated with pancreas divisum with underlying incomplete abdominal situs inversus (*6*). We searched MEDLINE and Embase for papers published in English till 30 September 2017 using the following terms: ("cholangiopancreatography, endoscopic retrograde" [MeSH Terms] OR ("cholangiopancreatography" [All Fields] AND "endoscopic" [All Fields] AND "retrograde" [All Fields]) OR "endoscopic retrograde cholangiopancreatography" [All Fields] OR "ercp" [All Fields]) AND ("situs inversus" [MeSH Terms] OR ("situs"[All Fields] AND "inversus" [All Fields]) OR "situs inversus" [All Fields]). Of the 38 results, 6

Table 1. Various techniques described for ERCP in patients with situs inversus

Technique	Salient feature	*Ref.*
Mirror image ERCP	Patient in right lateral position with endoscopist on patients right with all necessary endoscopic maneuvers were performed inversely as per normal procedures.	(*8*)
180 degree turn technique	Patient in prone position with endoscopist on patients right with duodenoscope has to be turned 180° clockwise in the stomach.	(*7,10,11,27*)
Left lateral technique	Patient in left lateral position with endoscopist on patients left with minor endoscopic maneuvers.	(*5*)
1 o' clock papillotomy	Patient prone on his right, endoscopist turned his right side toward the patient and papillotomy is done toward in direction of "1 o'clock".	(*12*)
Present report	Patient in usual position, and scope in usual position, Turn the scope tip up and inflate the stomach, visualise the body and push to the antrum, cross pylorus and turn counter-clockwise, turn the knob left and withdraw to focus the papilla.	

were in non-English literature and 2 were not relevant. Of the rest 30 results, data about 32 patients with situs inversus was reported (*2-5,7-8,10,12-35*). To the best of our literature search, this is the first report of successful endoscopic therapy for a case of traumatic pancreatic disruption. In our search, two patients had procedures in surgically altered anatomy for the diagnosis of CBD stone and anastomotic stricture in one patient each (*16,20*). Of the rest 30 cases, the commonest indication for ERCP in situs inversus was CBD stone (18 patients), malignant biliary obstruction (6 patients), biliary stricture (2 patients) while one patient each had portal biliopathy, ampullary adenoma, chronic calcific pancreatitis and normal CBD (*2-5,7-8,10,12-15,17-19,21-35*). This suggests that pancreatic endotherapy has been done very infrequently.

ERCP in patients with situs inversus is considered a difficult procedure and has been reported to fail in some cases (*21,26,28,32*). Various techniques have been described in literature (Table 1). One of the technique involves turning the duodenoscope 180° clockwise when in stomach and then again when the scope reaches second part of the duodenum (*4*). Another modification of above technique describes 180° clockwise turn of the scope in the gastric lumen and then use of a rotating sphincterotome for cannulation (*7*). The literature also describes a mirror-image method which places the patient in the right lateral decubitus position. In this technique, the equipment lies behind the patient with all manoeuvres performed inversely during ERCP (*8*). A different approach involves keeping the patient supine on the table with the endoscopist on the left of patient (*9*). These reports suggest that repositioning of the patient during the procedure is extremely common in order to obtain a stable position for the procedure. Our technique is similar to the mirror image technique but keeping the patient prone and also the last step is different as we have done the cannulation of the pancreatic duct rather than the bile duct as reported previously. The benefit of the technique reported by us is that the endoscopist is comfortable with maintaining the usual position of the endoscope and the patient.

In conclusion, ERCP with a few modifications to the standard technique, is feasible and safe in patients with situs inversus. We describe a successfully managed case of traumatic pancreatitis related external pancreatic fistula using pancreatic ductal stenting while maintaining the usual endoscope and patient position.

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