

Case Report

Endoscopic Retrograde Cholangiopancreatography Scope-induced Duodenojejunal Flexure Perforation: The World's First Case

Jignesh A. Gandhi, Pravin H. Shinde, Basavaraj K. Nagur, Rohan D. Digarse

Department of General Surgery, Seth GS Medical College and KEM Hospital, Mumbai, Maharashtra, India

ABSTRACT

Duodenojejunal (DJ) flexure perforation is very rare. DJ flexure perforation following endoscopic retrograde cholangiopancreatography (ERCP) has not been documented till date. They are associated with significant morbidity and mortality. We present an ERCP-induced DJ flexure perforation which has been treated with primary closure in two layers at our institution. To the best of our knowledge, this is the world's first case. Such site of ERCP-induced perforation has not been reported in literature till date. A 75-year-old female patient underwent repeated ERCP for obstructive jaundice. There was perforation during the third ERCP while removing the larger stone. Emergency laparotomy was performed with primary closure of perforation in two layers. ERCP-induced DJ flexure perforation has not yet been documented. It is potentially life-threatening. Early recognition may lead to a better prognosis through earlier intervention.

KEYWORDS: Duodenojejunal flexure perforation, endoscopic retrograde cholangiopancreatography, management

INTRODUCTION

Endoscopic retrograde cholangiopancreatography (ERCP) is an important diagnostic and therapeutic modality for various pancreatic and biliary problems. Despite well-established safety of this procedure, there are risks of complications such as pancreatitis, perforation, and bleeding. The incidence of perforation reported by recent series ranges from 0.3% to 1.3%.^[1,2] It causes significant mortality, especially if not diagnosed early.^[3] The therapeutic endoscopy increases the risk of complications, and perforation is more likely when the examination is performed by an inexperienced endoscopist.^[4] Early recognition and prompt treatment form the cornerstone of the management protocol of this dreaded complication.^[5] We present a case with ERCP-induced duodenojejunal (DJ) flexure perforation, which was successfully managed by primary closure of perforation, in two layers.

CASE REPORT

A 75-year-old female, known diabetic, was admitted to the nursing home, in rural area with diagnosis of obstructive jaundice with cholangitis. Computed

tomography findings were suggestive of intrahepatic biliary radical dilatation with a dilated common bile duct (CBD) and multiple stones in distal CBD, multiple calculi in distal CBD. The patient was referred to our center for ERCP and CBD clearance.

The first ERCP was suggestive of choledocholithiasis with purulent bile biliary; sphincterotomy with CBD stenting was done. Suprapapillary diverticulum was also noted.

The second ERCP was done after 2 weeks, it suggested choledocholithiasis with cholangitis with pus flakes. The patient was admitted and intravenous antibiotics were given, pus was sent for culture. *Klebsiella pneumonia* and *Escherichia coli* were isolated from the pus culture. Antibiotics were given according to sensitivity.

The third ERCP was performed after 2 more weeks. In attempt to achieve CBD clearance, CBD was swept with balloon and small fragments of stones were removed. On

Address for correspondence: Dr. Pravin H. Shinde, Flat No 21, Sawan Towers, Vallabh CHS, Sector 01, Kalamboli, Navi Mumbai - 410 218, Maharashtra, India. E-mail: drpravinshinde@yahoo.com

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removal of larger stone, suspicious perforation was seen in suprapapillary diverticulum, which was confirmed by fluoroscopy. The patient was immediately referred to emergency surgical room.

Management

The patient was resuscitated and CT was done. CT was suggestive of massive pneumoperitoneum [Figure 1]. The patient was taken for emergency laparotomy. Intraoperatively, we found minimal biliary contamination of 50 cc only on the left side of the abdomen. No contamination of bile was seen on the right side of midline. After washing out the contamination, the perforation of 1.5 cm × 1 cm was noted at DJ flexure. It was also noted that duodenum was contused and the root of mesentery which was close to the perforation showed the presence of hematoma [Figure 2]. This is likely due to mechanical injury causing contusion and perforation, and the only reason seems to be forceful entry secondary to unanticipated movements of the endoscope, with all efforts to reach back to work around the ampulla. The mechanism of perforation could be accidental reach of the scope beyond the area of ampulla due to unanticipated manipulation.

There were no undetected anatomical abnormalities present in that area, and it was confirmed on the exploration, which revealed the absence of any ulcer or diverticulum.

The devitalized part around the perforation was resected. Nasojejunal Tube (FERKA 120 cm) was inserted and was placed across the perforation. Perforation was closed with 3-0 Mersilk in two layers [Figure 3], in vertical manner to prevent stricture formation. No 32 UMA ADK drain was placed in the left paracolic gutter near the perforation and was brought out with separate incision on the left of the abdomen. Midline incision was closed with No 1 loop ethilon. JP (Jackson-Pratt Drain) drain was in subcutaneous space and skin was closed

3-0 ethilon. Patient shifted to SICU (surgical intensive care unit) on ventilator and was eventually extubated on day 3. Nasojejunal feeding was started on day 4. On day 7, no leak found on computed tomography with oral contrast. Hence, oral sips were started followed by liquid to soft diet and discharged on day 14.

DISCUSSION

ERCP-induced perforation is a dreaded complication for both patient and physician and is frequently the reason for ERCP-related lawsuits.^[6] The reasons for perforation include patient-related factors (such as postBillroth II gastrectomy) and technique factors (such as inexperienced endoscopist, difficult cannulation, precut, and sphincterotomy).^[7] Perforations related with ERCP were classified depending on their locations as follows: duodenal wall by the scope itself (type I), perivaterian by endoscopic sphincterotomy or endoscopic transpapillary balloon dilation (EPBD; type II), bile duct by a guidewire or basket (type III), and retroperitoneal air alone by compressed air leakage (type IV) [Figure 4].^[3] Our case could not be classified under any of these types.

The clinical presentation of ERCP perforation may be from mild abdominal tenderness to generalized peritonitis.

The management strategy for ERCP-related duodenal perforation can be determined based on the site and extent of injury, the patient's condition, and time to diagnose. Ultrasonography and plain X-rays may be used as initial screening investigations but may be false negative. We found CT an excellent investigation for evaluating suspected perforation, with 100% sensitivity. CT findings such as extraluminal or retroperitoneal air, contrast leak, or fluid collection indicate perforation. When a duodenal perforation is detected endoscopically, a comprehensive examination and a clear report should



Figure 1: Massive pneumoperitoneum



Figure 2: Perforation duodenojejunal flexure and presence of hematoma at root of mesentery

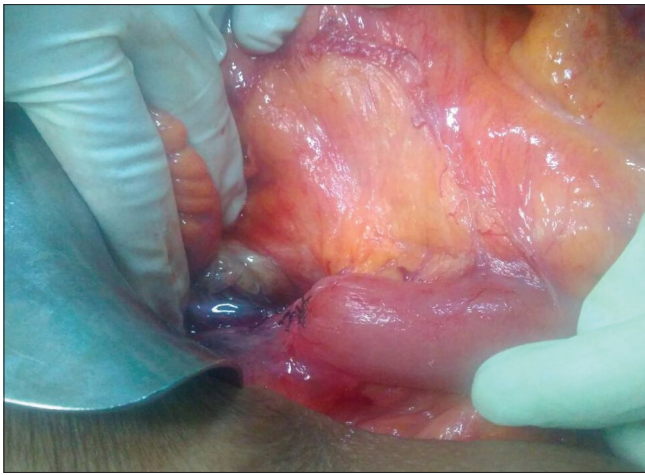


Figure 3: Primary closure of perforation in two layers

be written about its size and its location with a picture and the endoscopic treatment.

The indications for surgery are a major contrast medium leak, severe sepsis despite nonsurgical management, severe peritonitis, and fluid collections or unsolved problems (e.g., retained hardware) that cannot be solved by nonsurgical means. Patients with perforations diagnosed within 24 h of surgery have a mortality rate of 13%, whereas diagnosis delayed beyond 24 h increases mortality rates to 43% because of sepsis or multiorgan failure.^[8]

The treatment options of duodenal injury are primary repair of branch in duodenal wall which may be possible where injury is diagnosed early, and there is limited contamination of surrounding tissues.

Kocherization is usually needed to facilitate this, along with debridement of any devitalized tissue. Additional operative variations worthy of consideration include repair in one or two layers, transverse or longitudinal closure, and augmentation with a jejunal serosal^[9] or omental patch. In case of high risk for leak or fistula formal tube decompression involving placement of a transmural transperitonal duodenostomy or jejunostomy can be done. Recently, endoscopic devices such as endoclip, endoloop, ligation band, and fibrin glue are usually available and can be applied as soon as perforation occurs.

CONCLUSION

ERCP-induced DJ flexure perforation has not yet been documented. It is potentially life-threatening. The therapeutic endoscopy increases the risk of complications, and perforation is more likely when the examination is performed by an inexperienced endoscopist. Early recognition will lead to a better prognosis through earlier intervention.

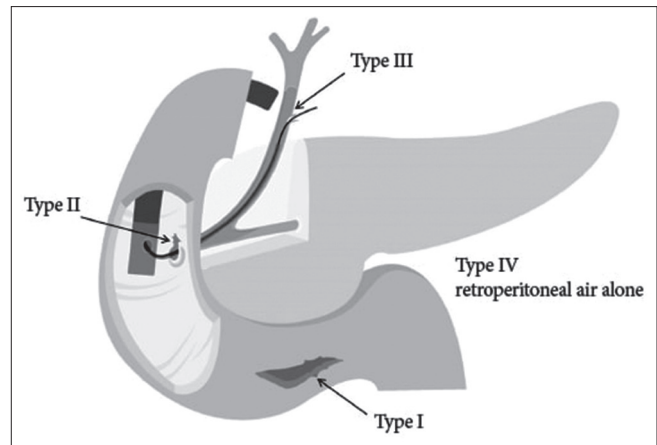


Figure 4: Stapfer's classification of endoscopic retrograde cholangiopancreatography-induced perforation

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Conflicts of interest

There are no conflicts of interest.

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