

Pneumoperitoneum following an Endoscopic Retrograde Cholangiopancreatography (ERCP): A case report

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SUMMARY

Post Endoscopic Retrograde Cholangiopancreatography (ERCP) pneumoperitoneum is commonly associated with perforated viscus but is rarely associated with benign causes. We present a case of 29 years old lady who underwent ERCP, who was found to have benign pneumoperitoneum subsequently. She was treated conservatively and recovered without complication. Although rare, post ERCP pneumoperitoneum of benign causes should be investigated as the course of treatment and outcome differ largely.

INTRODUCTION

Pneumoperitoneum is a radiological finding which indicates a perforated hollow viscus in over 85-90% of patients. On the other hand, there are 10 - 15% pneumoperitoneum cases where the aetiology is due to other causes like post operation, thoracic causes, pneumatosis cystoides intestinalis, endoscopy related, post-partum and the list goes on. These can be termed as "benign pneumoperitoneum" or "non-surgical pneumoperitoneum".¹ We present here a case of post Endoscopic Retrograde Cholangiopancreatography (ERCP) pneumoperitoneum from the latter group.

CASE REPORT

A 29 years old lady, para 4, postpartum 19 days (uneventful assisted breech delivery), presented with epigastric pain for 1 week. The pain radiated to the back, associated with nausea and vomiting. She also noticed yellowish discoloration of her eyes and skin, along with tea coloured urine and pale stool. On examinations, she was jaundiced, per abdomen tender over right hypochondrium and epigastric region, no mass palpable. Liver function test showed increased total bilirubin with predominantly direct bilirubin, significantly increased ALP, mildly increased AST and ALT.

Ultrasound hepatobiliary system showed dilated intrahepatic ducts over bilateral lobe. Common bile duct (CBD) was dilated with measurement of 1.1cm with a large hyperechoic lesion with posterior shadowing measuring 1.5cm in diameter suggestive of calculus.

Thus, ERCP was proceeded on the next available elective date which showed normal part 1 and 2 of duodenum, slit like ampulla of Vater. CBD was cannulated (no sphincterotomy done). Cholangiogram showed multiple distal CBD stones

with large common hepatic duct stones. The CBD was stented, with good flow of bile after that.

Almost immediately post ERCP, the patient developed severe epigastric pain which radiated to the tip of right shoulder. Pain was adequately controlled with IV Tramadol. On examinations, per abdomen showed tenderness over right hypochondrium and epigastrium region, no guarding. Amylase was 254. Chest x-ray erect was done, which showed air under diaphragm bilaterally (Figure 1).

A contrast enhanced Computed Tomography (CECT) Abdomen was carried out to investigate further. Mild pneumoperitoneum was noted at perihepatic region, falciform ligament, left subphrenic, and left hypochondriac regions. There were dilated bilateral intrahepatic ducts with aerobilia, more affecting the left intrahepatic ducts. No evidence of bowel perforation, biloma or intra-abdominal collection was observed (Figure 2).

She was treated with antibiotics, adequate analgesia, and hydration. Pain subsided after a few days in the ward, and she was discharged subsequently.

DISCUSSION

Post ERCP pneumoperitoneum is a rare complication. It is most associated with a perforation, especially in the duodenum. Depending on the severity, this perforation will usually warrant an emergency surgery to repair it to prevent a catastrophic consequence.² However, there is a group of "benign pneumoperitoneum" where perforation does not occur and can be managed conservatively. One of the explanations for this pneumoperitoneum without perforation is the high pressure of compressed air used during ERCP to maintain the patency of the lumen, creating a pressure valve from a site of low resistance, causing air to leak into the intraperitoneal space. This can happen in the retroperitoneal space as well, which causes pneumoretroperitoneum.^{2,3} In our patient, as evidenced in the CECT abdomen, aerobilia is noted in bilateral intrahepatic ducts, more affecting the left side. This may have been due to excessive air insufflation used during ERCP, and leakage of air through the mechanism as mentioned above.

Another cause regarding post ERCP benign pneumoperitoneum is the rupture of intrahepatic bile ducts

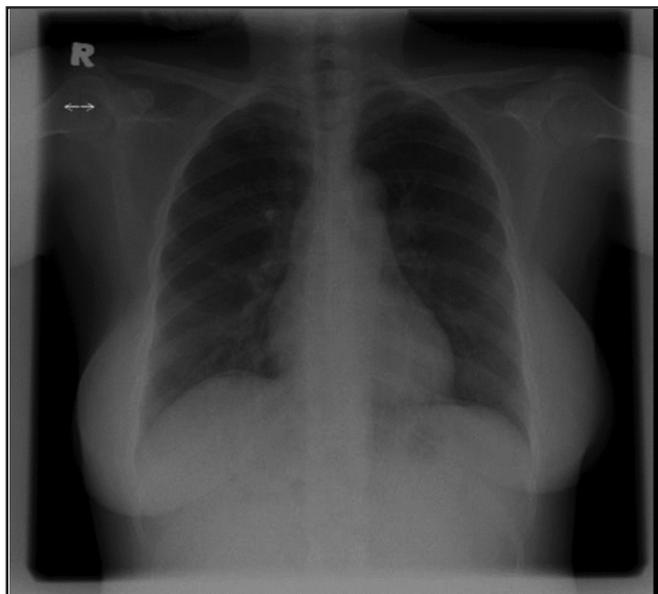


Fig. 1: Chest x-ray erect after ERCP which showed bilateral pneumoperitoneum.

and Glisson's capsule in a peripheral hepatic lesion. This is more common in cancer patients who have liver metastasis, owing to neoplastic tissue friability. However, benign disease such as hepatic abscess has been described as well. The explanation for this is air sufflation during ERCP causes retrograde airflow through the patent biliary tract into the diseased intrahepatic duct or Glisson's capsule, causing rupture and subsequently air leakage into the intraperitoneal cavity.^{4,5}

Other than ERCP related causes, gynecological cause is another possibility, as in our case. Since 1953, multiple gynecology related causes have been described, such as frequent vaginal douching, rough sexual intercourse, oral-vaginal insufflation, pelvic examination, postpartum or even an accidental fall in a jetted bathtub causing insufflation of the vagina.⁶

Previous publications have theorized two potential paths of air entering the peritoneal cavity through vagina.

- 1) Air enters through vagina, uterus, fallopian tube and into the peritoneal cavity. This usually happens in oro-vaginal insufflation, rough sexual intercourse, and vaginal douching.
- 2) Through opening at the vaginal stump post hysterectomy.

For postpartum patients, the first pathway is the underlying mechanism. It was suggested that the more patent post-partum female genital tract allows air to pass into the abdomen more easily through the vagina. This patency exists up to the involution of the uterus at 1-month post-partum.

On the other hand, generally, the commonest cause of benign pneumoperitoneum is post operation, when the air is trapped in the peritoneum from the established wound. Resolution of the air is expected with time. Two-thirds of cases

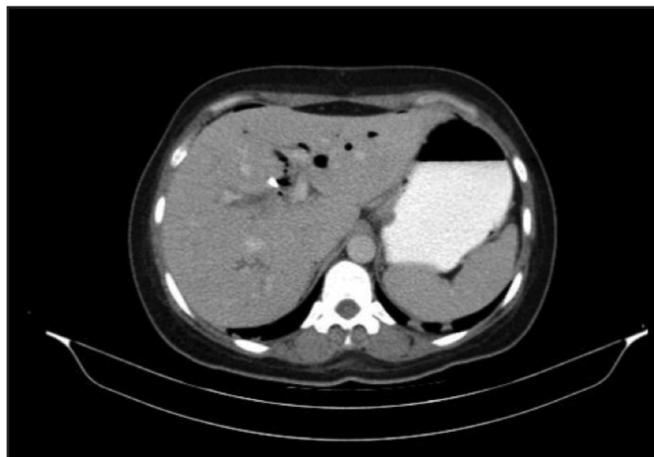


Fig. 2: Axial view of the CECT Abdomen – evidence of mild pneumoperitoneum and dilated bilateral intrahepatic ducts with aerobilia.

resolve within 2 days and 97% of the cases resolve within 5 days.⁷ However, some of the post-operative pneumoperitoneum may persist up to 8 – 10 days or even longer, depending on the nature of surgery.

Benign peritoneum post colonoscopy has been reported as well, although rare with an incidence at 0 to 3%. It was thought that microperforation or inflation of the bowel can cause transmural passage of air.⁸

Thoracic causes are common too, which can be due to mechanical ventilation, cardiopulmonary resuscitation, and tracheal ruptures due to endotracheal intubation.⁹

If diagnosis is in doubt, CT scan with contrast can be used. The high clinical efficacy of CT scan for diagnosis of perforated viscus is well established.¹⁰ In cases when the patient is not suitable for CECT scan or in a situation where CECT scan is not available, upper gastrointestinal Gastrografin study under fluoroscopy is another option. If no extravasation is demonstrated, a benign pneumoperitoneum can be diagnosed.

CONCLUSION

Majority of post ERCP patients who have abdominal pain and pneumoperitoneum will raise suspicion of perforated viscus and will require emergency laparotomy. However, other benign aetiology will need to be considered, especially when there is no clinical abdominal tenderness or peritonism, and when laboratory findings are less suggestive. CT scan is a reliable investigation to rule out perforated viscus. If it is deemed to be benign pneumoperitoneum, patients can be managed conservatively with intravenous antibiotics and bowel rest. Thorough history taking including gynecological or obstetrical system is a valuable adjunct in identifying the cause of pneumoperitoneum.

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