PNEUMOPERITONEUM CAUSED BY AIR LEAKAGE THROUGH THE PERCUTANEOUS PUNCTURE TRACT AS A COMPLICATION OF RENDEZVOUS TECHNIQUE: A CASE REPORT

Chiao-Hsiung Chuang, Chiung-Yu Chen, and Hong-Ming Tsai
Departments of Internal Medicine and Radiology, College of Medicine, National Cheng Kung University, Tainan, Taiwan.

The rendezvous technique, combining percutaneous and endoscopic procedures, is a safe and effective method to achieve biliary cannulation if an endoscopic approach fails. The two procedures in this technique can be carried out simultaneously or in stages. A simultaneous approach is reported to be associated with fewer complications, and patients undergoing this approach can recover and be discharged more rapidly. Here, we report a complication of pneumoperitoneum in a patient who underwent percutaneous and endoscopic procedures simultaneously for the removal of a common bile duct stone. It was supposed that prolonged air insufflation during endoscopy forced intestinal air to track into the peritoneal cavity through the bile ducts and the puncture tract. Accordingly, a short wait before removing the percutaneous catheter to deflate the intestinal air will be helpful to avoid such a complication.

Key Words: endoscopic retrograde cholangiography, percutaneous transhepatic cholangiography, pneumoperitoneum, rendezvous technique

Received: Feb 14, 2008 Accepted: Mar 27, 2008
Address correspondence and reprint requests to: Dr Chiung-Yu Chen, Department of Internal Medicine, College of Medicine, National Cheng Kung University, 138 Sheng-Li Road, Tainan 704, Taiwan.
E-mail: chiungyu@mail.ncku.edu.tw

Cannulation of the bile duct in endoscopic retrograde cholangiopancreatography (ERCP) may fail in around 3–10% of cases [1]. By combining radiologic and endoscopic procedures, the rendezvous technique solves this problem [2]. In this technique, a guide wire is first passed through the percutaneous catheter into the biliary tract and down to the duodenum. The wire is then picked up by an endoscopic snare and pulled out from the biopsy channel of the duodenoscope. Thus a wire-guided sphincterotomy can be introduced into the common bile duct (CBD) along with the guide wire. Following cannulation, endoscopic papillotomy and stone retrieval can be performed as a standard procedure.

This technique is efficient and safe with occasional complications, including pancreatitis, cholangitis, septicemia, bile leakage, and retroperitoneal perforation [3,4]. Radiologic and endoscopic procedures can be performed either simultaneously or separately. Fewer complications and shorter hospital stays are reported if both procedures are performed simultaneously [4]. We report a case of air leakage through a percutaneous puncture tract into the peritoneal cavity, when both procedures were performed simultaneously for treatment of a CBD stone.

CASE PRESENTATION

An 85-year-old woman had intermittent epigastric pain for 2 months. She had neither fever nor jaundice.
Laboratory results were as follows: hemoglobin, 13.9 g/dL; white cell count, 9,900/μL; platelet count, 297,000/μL; aspartate aminotransferase, 233 U/L; alanine aminotransferase, 150 U/L; total bilirubin, 0.5 mg/dL, alkaline phosphatase, 241 U/L; and γ-glutamyl transpeptidase, 832 U/L. An abdominal magnetic resonance image showed a 2-cm CBD stone. Endoscopic removal of the gallstone failed during bile duct cannulation. Considering the surgical risk associated with her age, the rendezvous technique was subsequently performed. In the radiologic procedure, using an 18-gauge percutaneous transhepatic cholangiography needle (PTC needle; Tokyo, Japan) and a 5-Fr angiographic catheter (Beacon® Tip Torcon NB® advantage catheters; Cook Group Inc., Bloomington, IN, USA), a guide wire was inserted through the bile ducts to the second portion of the duodenum. The endoscopic procedure was then performed to pull out the guide wire from the duodenum and a wire-guided sphincterotomy was used to incise the papilla. Although the papillotomy was successful, the papilla became edematous after repetitive manipulation. We therefore decided to halt gallstone retrieval and inserted a 7-Fr endoprosthesis (Flexima™; Boston Scientific Microvasive, Natick, MA) to temporarily relieve the biliary obstruction. The percutaneous catheter and guide wire were subsequently removed.

After the procedure, the patient had upper abdominal pain, raised body temperature of 37.8°C, and epigastric tenderness. She was kept fasting and was placed on intravenous antibiotics. By the next morning she felt better, but the epigastric tenderness persisted. Non-contrast abdominal computed tomography (CT) revealed a gallstone, free air accumulated mainly over the subphrenic area (Figure 1), and pneumobilia with an air tract extending from the right lobe of the liver into the peritoneum (Figure 2). The path of the intrahepatic air tract and PTC puncture tract coincided with each other when comparing the CT image with PTC. On the third day after the procedures, she reported passage of flatus and was allowed to slowly advance her diet. She made an uneventful recovery and was discharged 1 week later.

**DISCUSSION**

In the rendezvous technique, the PTC and endoscopic procedure can be performed simultaneously or separately. However, there are no clear guidelines defining the appropriate time interval between these two procedures. In Wayman et al’s study, bile leakage and catheter dislodgment were noted only in patients who underwent these two procedures separately, and the authors suggested that the PTC and endoscopic procedures should be performed simultaneously [4]. In the rendezvous technique, pneumoperitoneum complications have only been reported in patients who had duodenal perforations caused by papillotomy [3]. Furthermore, a massive pneumoperitoneum was
reported in a patient who underwent endoscopic retrograde cholangiopancreatography immediately after endoscopic ultrasonography-guided fine needle aspiration [5]. In that case, prolonged air insufflation forcing the air to enter the peritoneum via the needle puncture site of the duodenum was postulated as the cause of pneumoperitoneum. Our patient had no duodenal perforation as indicated by the lack of retroperitoneal air. The presence of an intrahepatic air tract is also counter to such a diagnosis. Moreover, the prolonged air insufflation may have encouraged intestinal air into the bile ducts via the biliary endoprosthesis. The air then tracked through the PTC puncture route and entered the peritoneum when we withdrew the percutaneous catheter and guide wire.

Although the clinical course was not severe, the management of such a complication has never been reported in the literature. The situation of our patient was different from that of pneumoperitoneum caused by endoscopic papillotomy. The latter concerns leakage of intestinal content or bile from the perforation site and a period of fasting and parenteral antibiotic usage is the normal treatment. Our patient had no risk of intestinal leakage and the only concern was paralytic ileus associated with the pneumoperitoneum. Therefore, she was able to resume oral intake after 3 days when bowel movement was noted.

In summary, we report a case of pneumoperitoneum as a rare complication of the rendezvous technique. Pneumoperitoneum occurred owing to prolonged air insufflation during endoscopy plus PTC puncture and biliary stenting. This draws attention to the timing of the withdrawal of the percutaneous catheter after completing the rendezvous technique. Accordingly, we suggest a short waiting period to deflate the intestinal air before removing the percutaneous catheter if the radiologic and endoscopic procedures are performed simultaneously.

REFERENCES

經皮穿肝與內視鏡膽道會合技術時空氣經由穿刺路徑進入腹腔而併發腹腔積氣 — 病例報告

莊維雄 1 陳炯瑜 1 蔡宏名 2

國立成功大學 醫學院附設醫院 1內科部 2放射診斷部

對於內視鏡逆行性膽道攝影時膽管插管困難的患者，併用經皮穿肝膽道攝影與內視鏡會合技術是一有效與安全的解決方法。經皮穿刺程序與內視鏡程序可分兩階段進行，也可一階段接續完成。文獻報告若兩程序在一階段完成的併發症較少，住院時間也較短。在此我們報告一位接受一階段會合技術以取出總膽管結石，卻併發腹腔積氣的病例。因內視鏡過程中持續的灌氣，使腸道中高壓的空氣循著切開的乳突與經皮穿肝穿刺之路徑進入腹腔。據此，在會合技術結束拔除經皮穿肝膽道導管前，先將腸道中的空氣抽出應有助於減少此併發症。

關鍵詞：內視鏡逆行性膽道攝影術，經皮穿肝膽道攝影術，腹腔積氣，會合技術

(高雄醫誌 2008;24:614–7)