

Management of Post-ERCP Air Leak: A Case Report

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Abstract

Endoscopic retrograde cholangiopancreatography (ERCP) is associated with retroperitoneal perforation in approximately 2.1% patients, but not infrequently, retroperitoneal air, pneumoperitoneum, pneumomediastinum, pneumothorax, and subcutaneous emphysema are also reported which may or may not be associated with retroperitoneal perforation. We report the case of a female patient with post-ERCP air leak into different compartments without iatrogenic gastrointestinal perforation and which was managed conservatively.

Keywords: Endoscopic retrograde cholangiopancreatography, contrast enhanced computed tomography, side viewing esophagogastroduodenoscope

Introduction

ERCP-related perforation is a rare but serious complication.^[1] Not infrequently, retroperitoneal air, pneumoperitoneum, pneumomediastinum, pneumothorax, and subcutaneous emphysema are reported even without evidence of retroperitoneal perforation and usually respond to conservative management.^[1,2,3] We report a case of female patient with post-ERCP pneumothorax, pneumomediastinum, pneumoperitoneum, pneumoretroperitoneum, and subcutaneous emphysema without iatrogenic gastrointestinal perforation and which was managed conservatively.

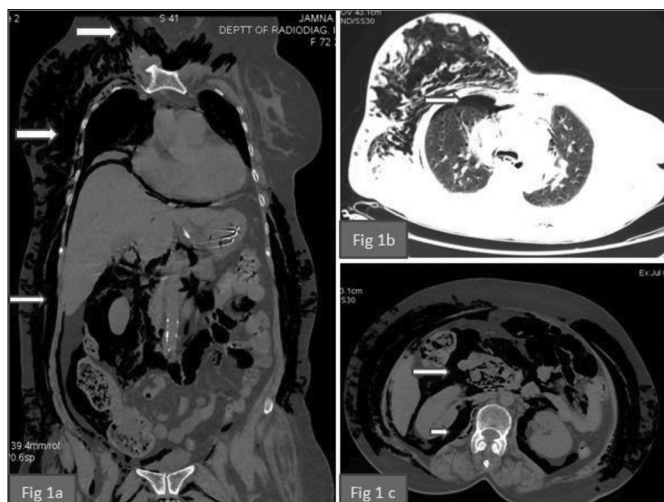
Case Report

A 72-year-old female with cholelithiasis and choledocholithiasis underwent ERCP with sphincterotomy as well as stone extraction with balloon under deep sedation with intravenous propofol under anesthetist supervision (Fig. 1). The procedure was difficult and

prolonged. Late near the end of the procedure sudden drop in oxygen saturation from 96% to 84% was noticed on monitor by the anesthetist. This prompted the anesthetist to auscultate the chest who noted the presence of crepitus over the anterior as well as posterior aspect of chest, neck, face and abdominal wall with slightly distended abdomen. Side viewing esophagogastroduodenoscope (SVE) was withdrawn immediately and patient position changed from prone to supine and ventilation started with 100% oxygen on Bain circuit. After resuscitation and improvement in oxygen saturation, she was shifted to intensive care unit. To rule out gastrointestinal perforation, Chest and abdominal contrast enhanced computed tomography (CECT) performed which revealed subcutaneous emphysema (Fig 1a), right sided small pneumothorax (Fig. 1b) and pneumomediastinum, pneumoperitoneum and pneumoretroperitoneum (Fig. 1c) without evidence of contrast leak and/or retroperitoneal or peritoneal collections.

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CECT Chest and Abdomen- Fig 1a- arrows showing subcutaneous emphysema over neck, chest and abdomen, fig 1b- arrow showing small right sided pneumothorax, fig 1c- big arrow showing pneumoperitoneum and pneumoretroperitoneum.

As patient was clinically stable, had small right-side pneumothorax (less than 50% of the volume of hemithorax) with no previous underlying lung condition, she was managed conservatively with oxygen inhalation, nasogastric suctioning, broad-spectrum antibiotics and careful monitoring in high dependency unit. Her clinical condition rapidly improved, with lung re-expansion without the need of chest tube insertion and reduction of pneumoperitoneum and surgical emphysema. She was discharged after 2 weeks.

Discussion

Some types of ERCP-related perforation can be managed conservatively. Stapfer *et al.*^[4] classified the ERCP-related perforation into 4 types in descending order of severity: Type I, lateral or medial wall duodenal perforation; Type II, peri-Vaterian or periampullary perforation; Type III, distal bile duct injuries related to wire/basket instrumentation; and Type IV, retroperitoneal air alone. Type IV is probably related to the use of compressed air to maintain patency of the duodenal lumen, which can result in air diffusion within the layers of the duodenal wall or outside the lumen, as in pneumatosis cystoides.^[4] Insufflated air can track along the perineural and perivascular sheaths to enter the mediastinum.^[5] Subsequent rupture of the mediastinal pleura allows air to decompress into the pleural cavity and cause a pneumothorax. The visceral space of the deep cervical fascia in the neck surrounds the trachea and oesophagus and is contiguous with the diaphragmatic hiatus, hilar vessel interstitium and major airways of the thorax.^[5] This contiguity allows free

movement of air and formation of subcutaneous emphysema around upper cervical region, which then tracks down the endothoracic fascia of the chest wall and transversalis fascia of abdomen to cause diffuse subcutaneous emphysema. This is not a true perforation, and therefore does not require surgical intervention. Ferrara *et al.*^[1] have reported pneumomediastinum, pneumothorax, and subcutaneous emphysema after endoscopic sphincterotomy without evidence of perforation. Like Ferrara, *et al.*,^[1] we too did not find any evidence of true perforation; hence it is likely that this complication probably occurred because of prolonged air insufflations and tracking of air along the perineural and perivascular sheaths. Seymann GB *et al* and Kaul S *et al* have also reported occurrences of retroperitoneal air, pneumoperitoneum, pneumomediastinum, pneumothorax, and subcutaneous emphysema after ERCP, which may or may not be associated with retroperitoneal perforation^[6,7] and usually respond to conservative management.

Conclusion

Post ERCP air leak into different compartments leading to pneumoretroperitoneum, pneumoperitoneum, pneumomediastinum, pneumothorax and extensive subcutaneous emphysema can occur during ERCP procedure rarely even without evident gastrointestinal perforation, and can be managed conservatively.

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