A 62-year-old woman developed abdominal pain several hours after ERCP.

Imaging Findings:

A 62-year-old woman underwent a therapeutic ERCP papillotomy and stone removal for symptomatic choledocholithiasis (Fig. 1). Several hours later she started complaining of severe abdominal pain. She did not have any peritoneal signs and was afebrile with no evidence of leukocytosis. She subsequently had a portable chest x-ray that showed evidence of pneumoretroperitoneum, pneumomediastinum, and subcutaneous neck emphysema (Fig. 2). No definitive pneumothorax was indentified at that time. A repeated portable chest x-ray the next day showed persistence of previous findings with associated bilateral pneumothoraces measuring around 1.5-2cm. Portable abdominal-2 views done at the time showed evidence of left mid-abdomen intra-peritoneal air with prominent Rigler’s sign (Fig. 3). She subsequently underwent upper GI gastrograffin study and chest CT, abdomen & pelvis. The UGI was followed to the proximal jejunum with no evidence of contrast extravasation (Fig. 4). The CT of the chest, abdomen & pelvis showed bilateral neck subcutaneous emphysema, pneumomediastinum, pneumothoracesis and intra/retroperitoneal air especially around the proximal third of the duodenum (Fig. 5, 6). There was no evidence of extra-luminal oral contrast, pancreatitis or intra-abdominal abscess. There was some focal thickening of the second part of the duodenum likely indicating the site of insufflation or injury (Fig. 7).

Discussion:

The prevalence of duodenal perforation following ERCP is usually quoted to be around 1-2% and it is associated with a mortality of around 25 % [1, 2, 3]. Asymptomatic free retroperitoneal air alone, with no evidence of perforation by UGI, has been thought to occur secondary to insufflation of air causing pneumatosis and diffusion of air into retroperitoneal space [4, 5, 6]. These patients are usually managed conservatively with bowel rest and antibiotics [5, 6]. Care must be taken to identify patients with a true perforation with associated extravasation of contrast material. This is associated with a high mortality. In case of minimal extravasation with no associated intra-peritoneal fluid collections, non-surgical option such as stent placement and percutaneous biliary drainage can be employed [6, 7]. However, unsuccessful biliary drainage and failure of medical therapy is associated with a mortality of around 50% [1, 5]. These cases need surgical management [5].

There have been several case reports of pneumothorax, pneumomediastinum, pneumoperitoneum,
pneumoretroperitoneum, and subcutaneous emphysema developing after ERCP [8, 9, 10]. This appears to occur secondary to the pneumoretroperitoneum tracking up to the mediastinum and to the subcutaneous tissue of the neck [8, 9, 10, 11]. Similarly, there are cases of pneumothoraces and pneumomediastinum extending down to the retroperitoneum and to the peritoneum [12, 13, 14, 15]. These spread seems to track along continuous fascial planes that exist between these spaces. Therefore, it is imperative to consider existence of these anatomical links when considering the etiology of one these conditions in the presence of another. This will limit the number of unnecessary tests and interventions.

**Differential Diagnosis List:** Benign extensive pneumomediastinum, pneumoperitoneum and pneumoretroperitoneum following ERCP.

**Final Diagnosis:** Benign extensive pneumomediastinum, pneumoperitoneum and pneumoretroperitoneum following ERCP.

**References:**


Figure 1

Description: Origin:
Figure 2

Description: Origin:
Figure 3

Description: Origin:
Figure 4

Description: Origin:
Figure 5

Description: Origin:
Figure 6

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Figure 7

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