

Spontaneous Pneumoperitoneum and Retro Pneumoperitoneum of Unknown Origin

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Abstract

Background: We report the first case in the literature of a spontaneous pneumoperitoneum and retro-pneumoperitoneum.

Case presentation: A 16 year old female, with no previous history of illness, presented in Emergency Department with brutal acute abdominal pain with septic shock signs. The abdomen computed tomography showed pneumoperitoneum and retro-pneumoperitoneum. The patient was operated by laparoscopy which revealed a moderate purulent ascites but didn't find any cause of the peritonitis. Post operative care was uneventful and patient was discharged at the 6th post operative day. The ascitic fluid culture was negative.

Conclusion: The laparoscopic approach for acute peritonitis management is very important because it is an efficient tool to diagnose and treat unusual causes of acute spontaneous or primary peritonitis, and permits also to avoid useless laparotomy.

Keywords: Pneumoperitoneum; Retro-pneumoperitoneum; Idiopathic; Peritonitis; Laparoscopy

Introduction

The presence of Pneumoperitoneum (PP) is usually a surgical emergency, due to a perforated intra-abdominal hollow viscus in over 90% of PP patients [1]. PP is extremely rarely associated with air in the Retro-Pneumoperitoneum (RPP). This association is theoretically due to a perforation of retroperitoneal segment of the gastrointestinal tract such as duodenal perforating ulcers [2] or ruptured sigmoid/ascending/descending colon diverticuli [3,4]. We report the first case in the literature of a combined PP with PRP of unknown origin.

Case Presentation

A 16 year old female, with no previous medical or surgical past history, consulted Emergency Department for sudden acute abdominal pain evolving since 6 hours. There was no associated vomiting, no constipation, no urine disorders nor vaginal discharge. On examination, patient was feverish at 38.5°C, Blood pressure 110/65, pulse 110/mn, Saturation 95% under ambient air. The abdomen was tender with generalized guardness. The digital touch examination was without abnormalities. The rest of physical examination was normal. Abdomen X-ray was done showing bilateral pneumoperitoneum (Figure 1).

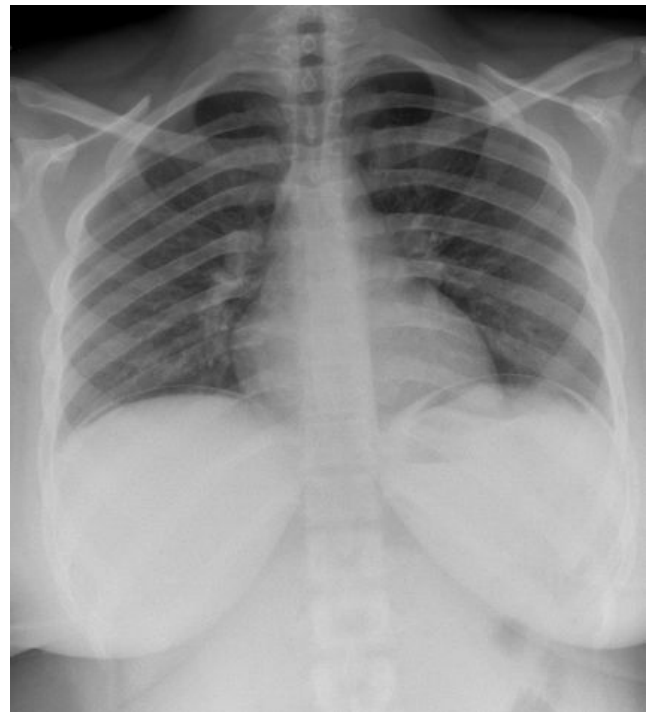


Figure 1: Abdomen X-ray Bilateral PP.

Chest X ray was free. Laboratory tests were done: White Blood Cells (WBC) $20.9 \times 10^9/L$, Hemoglobin: 12.2 g/dL, Platelet: 335×10^9 , C-

Reactive protein 316.6 mg/L, Creatinine: 63.7 mmol/L, Urea: 3.2 mmol/L. A CT-abdomen without contrast was done, showing PP and PRP (Figures 2 and 3). No apparent cause was suspected nor identified.

The decision was to perform an urgent laparoscopic exploration. The laparoscopy showed a mild generalized purulent peritoneal fluid, which was taken for culture. The stomach and the duodenum were normal. The colon, the appendix and the small bowel were normal. The uterus and annexes were slightly inflamed. Blue methylene tests through a naso-gastric tube and a rectal tube were performed and were negative. The decision was to put a pelvic drain and to not convert.



Figure 2: Abdomen CT Scan: PP+PRP (PP= Pneumoperitoneum; PRP = Platelet-Rich Plasma).

The postoperative outcomes were uneventful under medical resuscitation and combined antibiotherapy (Cefuroxime and Metronidazole): patient was becoming not feverish and passed gas and stool at the second postoperative day.



Figure 3: RPR Arrow (RPR= Rotational Panoramic Radiography).

The ascites fluid culture was negative. A second CT abdomen scan with intravenous contrast and oral and rectal gastrograffin contrast was done, and showed the same PP and PRP without any evident cause. The patient was discharged under oral antibiotherapy (Cefuroxime +

Metronidazole) at the 6th post operative day. A colonoscopy was performed after 1 month was normal and the patient seen after 6 months was well doing and non-symptomatic.

Discussion

The association between PP and PRP is due usually to a perforation of intraperitoneal and retroperitoneal hollow viscus (duodenum, ascending and descending colon, rectum). In our case, this fact was excluded by intra-operative laparoscopic findings through meticulous exploration and the use of methylene blue test through the upper GIT and the rectum. We also performed immediate post-operative oral and lower enema gastrograffin contrast CT scan, which didn't show any contrast extravasation.

Few other causes of PP and PRP association were published in the literature. There were reported 7 cases of *Pneumocystis carinii* intestinalis [5-9], one case of bowel perforation due to extensive intestinal necrosis as a complication to chemotherapy [10], one case of late intestinal infarction [11], one case of acute pancreatitis [12] and one case of a blunt abdominal traumatism [13]. None of these causes were identified in our case.

There are many reports of combined PP, PRP and Pneumomediastinum (PNM) in the literature. Most of them were due to iatrogenic interventions (ERCP, colonoscopy, thoracoscopy, positive end expiratory pressure therapy), but we didn't find any paper reporting idiopathic cases or unknown origin.

Primary peritonitis is very rare cause of acute peritonitis. Primary peritonitis has a diverse bacterial etiology and *Streptococcus pyogenes* is one of the rare pathogens responsible for this disease [14], commonest being *Escherichia coli*, *Klebsiella pneumoniae*, and *Streptococcus pneumoniae* [15]. The diagnosis of primary peritonitis is made in retrospect when secondary causes of peritonitis such as gastrointestinal perforation or anastomotic leakage are excluded. Among reported cases of primary peritonitis, the portal of entry into the peritoneum has rarely been identified [14]. In our case, the haemocultures and the ascitic fluid culture didn't show any bacteria growth. No cutaneous source of *Streptococcus pyogenes* was identified, and there was no personal or family history of streptococcal pharyngitis. The dental and oro-pharyngeal examinations were normal. No another septic entry source was found pre and post-operatively.

Pneumoperitoneum without GI tract perforation and without evidence of any other causes (intrathoracic, intra-abdominal, gynecologic, iatrogenic or various other reasons) is uncommon [1, 16]. It is called Spontaneous Peritonitis (SP) or non-surgical peritonitis. Generally, SP is not complicated by peritonitis, is benign and can be treated conservatively [1,17,18]. Idiopathic SP is a very rare condition of unknown etiology, which can only be identified by exclusion of visceral perforation and other causes leading to presence of intra-abdominal free air [1,19,20]. SP diagnosis is usually made following a negative laparotomy. Presence of vague signs of peritonitis and pneumoperitoneum prior to laparotomy is especially challenging for the surgeon. In our case, the clinical signs of acute peritonitis were marked with septic signs, so that a surgical exploration was non avoidable. The laparotomy was avoided by laparoscopy, which also permitted to drain purulent ascites fluid. However, the literature review didn't report any primary or spontaneous peritonitis clinical presentation with PP and PRP association. So that, we cannot confirm that our case was a primary peritonitis.

Conclusion

We report the first case of spontaneous association of PP and PRP, with septic signs and peritonitis clinical presentation. Considering the young age of our patient, primary peritonitis with missed negative culture, missed bacterial entry source and atypical radiologic finding (PP and PRP) was probably the cause. The aim of our report is to enhance the role and the importance of the laparoscopic approach for acute peritonitis management because it is an efficient procedure to diagnose and treat unusual causes of acute spontaneous or primary peritonitis, which permits also to avoid useless laparotomy.

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