

Fauxing Pneumoperitoneum

S Aggarwal, P Garg, A Narang, S Verma, S Mittal, S Bhorawal, V Rathee

Citation

S Aggarwal, P Garg, A Narang, S Verma, S Mittal, S Bhorawal, V Rathee. *Fauxing Pneumoperitoneum*. The Internet Journal of Surgery. 2012 Volume 28 Number 4.

Abstract

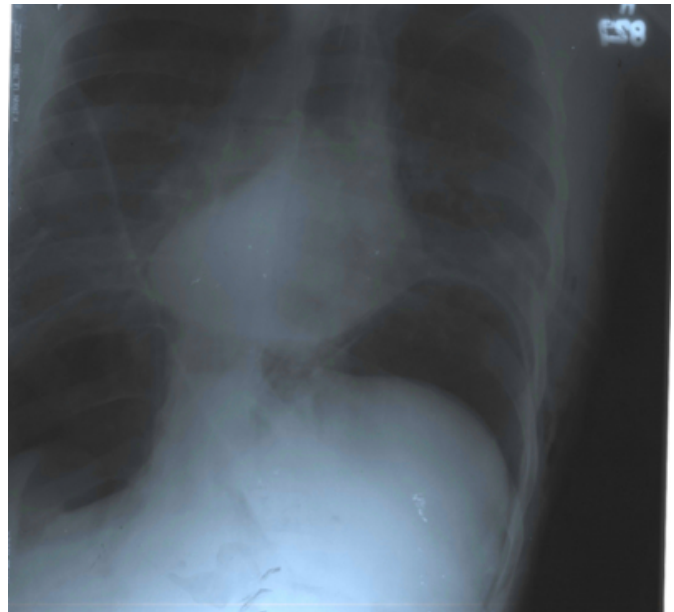
Pneumoperitoneum is a radiologic term denoting abnormal collection of air in the peritoneal cavity. It is an important plain x-ray finding. This usually indicates that there is a perforation of some part of gut causing air to leak through it; however, it has also been reported with non-surgical causes. Presence of pneumoperitoneum requires urgent surgical intervention until proved otherwise. Untreated, pneumoperitoneum has high morbidity and mortality. Pneumoperitoneum with a definite cause is well documented but pneumoperitoneum without cause, i.e. spontaneous pneumoperitoneum, is a rarity. We are presenting a case of spontaneous pneumoperitoneum.

CASE SUMMARY

A 40-year-old male came to emergency with history of Motor Vehicle Accident. On examination he was found to have multiple palpable rib fractures and subcutaneous emphysema bilaterally. He had cranio-cerebral trauma also (Glasgow Coma Scale 4/15). Bilateral intercostal tubes were inserted and tracheostomy was done after stabilizing the cervical spine. Fluid resuscitation continued. On secondary survey, the abdomen was soft but 3 hours later, subcutaneous emphysema was present reaching down to the umbilicus. Meanwhile, cervical spine X-ray showed cervical spine subluxation at the level of C3-4 and chest and abdominal X-ray revealed air under the diaphragm on both sides (fig. 1). Ultrasonography could not contribute much due to subcutaneous emphysema. Other investigations like CT scan could not be done due to poor general condition. Since vitals were not getting stabilized despite best resuscitation, it was decided to explore the abdomen in view of air under the diaphragm. On exploration, to our great surprise none of the hollow viscera was found perforated and the abdomen was practically virgin. The abdomen was closed after putting a drain in the pelvis.

Figure 1

Fig.1: X- ray showing huge amounts of air under the diaphragm on both sides



DISCUSSION

Pneumoperitoneum means air beneath the diaphragm, i.e. in the abdominal cavity, and is a radiological term¹. It is commonly the result of visceral perforation. Uncommonly, some non-surgical causes of pneumoperitoneum can be seen. Presence of air under the diaphragm warrants surgery to prevent morbidity and mortality. Causes of pneumoperitoneum without visceral perforation include intra-thoracic or gynecologic ones, or it may also be iatrogenic (like post-operative and post-ERCP

pneumoperitoneum); these forms are usually managed conservatively.^{2,3}

Pneumoperitoneum is the result of a gastrointestinal (GI) tract perforation in more than 90% of cases². Other causes include trauma (including barotrauma), pneumothorax and bronchoperitoneal fistula, emphysematous cholecystitis, spontaneous bacterial peritonitis, ruptured hepatic abscess and perforated pyometra, mechanical ventilation and after sexual violence.⁴ Perforation of the stomach or duodenum caused by peptic ulcer is considered the most common cause of pneumoperitoneum. Pneumoperitoneum can also be the result of a diverticular rupture or of an abdominal trauma³.

Entry of air through thorax into the abdomen has been explained through microscopic defects present in pleura and diaphragm. Air can even enter through the mediastinum along perivascular connective tissue traveling retroperitoneally and then rupturing into the peritoneal cavity causing pneumoperitoneum. Even cardiopulmonary resuscitation can lead to abdominal free air due to combination of increased airway pressure and application of blunt force to the chest.⁵

In the present case, the patient had sustained various systematic injuries along with thoracic trauma signifying major impact at the time of accident. The best method is serial monitoring of X-ray or serial CT showing increasing or decreasing air. In the present case, the general condition

of the patient did not allow serial radiologic monitoring. There is paucity of similar experience in literature.⁶⁻⁹

Despite demonstration of air under the diaphragm in X-ray, one may rarely not find any obvious cause; yet exploration in such a case is not totally out of place for obvious reasons.

References

1. Mularski RA, Ciccolo ML, Rappaport WD: Nonsurgical causes of pneumoperitoneum. *West J Med*; 1999; 170: 41-6.
2. Pitiakoudis M, Zezos P, Oikonomou A, Kirmanidis M, Kouklakis G, Simopoulos C: Spontaneous idiopathic pneumoperitoneum presenting as an acute abdomen: a case report. *J Med Case Reports*; 2011; 5: 86.
3. Karaman A, Demirbilek S, Akin M, Gürünlüoğlu K, Irşi C: Does pneumoperitoneum always require laparotomy? Report of six cases and review of the literature. *Pediatr Surg Int*; 2005; 21: 819-24.
4. Im DD, Pak PS, Cua B, Feinberg E: Pneumoperitoneum after sexual assault in a patient who had hysterectomy 30 years ago: case report. *J Emerg Med*; 2012; 42: 540-2.
5. Mularski RA, Ciccolo ML, Rappaport WD: Nonsurgical causes of pneumoperitoneum. *West J Med*; 1999; 170: 41-6.
6. Perry ZH, Netz U, Abu-Ganim A, Mizrahi S: [Free abdominal air in the emergency room--a diagnostic dilemma]. *Harefuah*; 2011; 150: 193-5, 202.
7. Andreone P, L'Heureux P, Strate RG: An unusual cause of massive non-surgical pneumoperitoneum: case report. *J Trauma*; 1989; 29: 1286-8.
8. Kim JJ, Jin W, Hyun SY, Shin HP, Shin JH, Lee G: Combined epidural emphysema and nonsurgical pneumoperitoneum after blunt trauma: report of two cases and review of the literature. *J Trauma*; 2009; 67: E183-6.
9. Di Saverio S, Filicori F, Kawamukai K, Boaron M, Tugnoli G: Combined pneumothorax and pneumoperitoneum following blunt trauma: an insidious diagnostic and therapeutic dilemma. *Postgrad Med J*; 2011; 87: 75-8.

Author Information

Sourabh Aggarwal, M.B.B.S

Department of Surgery, Pt. B. D. Sharma Post Graduate Institute of Medical Sciences

Pradeep Garg, M.S, D.N.B

Department of Surgery, Pt. B. D. Sharma Post Graduate Institute of Medical Sciences

Amit Narang, M.B.B.S

Department of Surgery, Pt. B. D. Sharma Post Graduate Institute of Medical Sciences

Surender Verma, M.S

Department of Surgery, Pt. B. D. Sharma Post Graduate Institute of Medical Sciences

Sachin Mittal, M.B.B.S

Department of Surgery, Pt. B. D. Sharma Post Graduate Institute of Medical Sciences

Sandeep Bhorawal, M.S

Department of Surgery, Pt. B. D. Sharma Post Graduate Institute of Medical Sciences

Vazir Singh Rathee, M.S

Department of Surgery, Pt. B. D. Sharma Post Graduate Institute of Medical Sciences