Spontaneous Asymptomatic Pneumoperitoneum

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A radiologic finding of pneumoperitoneum usually constitutes a surgical emergency because it generally indicates a perforated viscus which should be closed as soon as possible. We report here a patient with spontaneous pneumoperitoneum who was asymptomatic and did not require exploratory laparotomy. This unusual case illustrates and emphasizes that conservative management and close observation can avoid unnecessary operation.

Case Report

A 65-year-old white male was admitted to the hospital on April 2, 1972, after three weeks of nonproductive coughing. The patient was a well-developed and well-nourished male in no acute distress. Head and neck signs were unremarkable. Scattered rales could be heard at the base of the right lung. The heart was not enlarged and there were no murmurs. The radial pulse was full and showed atrial fibrillation. The abdomen was soft and non-tender.

Hemoglobin count at admission was 14.9 gm/100 ml and the white blood count 12,500/cumm with a normal differential. Urinalysis revealed 8-25 WBC per high power field but was otherwise within normal limits. An electrocardiographic tracing showed only atrial fibrillation. Roentgenograms of the chest showed a possible middle lobe infiltrate and probable bilateral pleural effusions.

Diagnoses at admission were:
1. Congestive heart failure with atrial fibrillation
2. Arteriosclerotic heart disease
3. Chronic obstructive pulmonary disease
4. Peripheral vascular occlusive disease

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The patient was treated with digitalis, bronchodilators and supportive care. His condition gradually improved. On his fifth hospital day (4/7/72), a progress chest film revealed free air beneath both diaphragms. A surgical consultation was obtained although the patient denied any symptoms. Examination showed the abdomen was soft, non-tender and with normal bowel sounds. Other physical examination findings were essentially normal. Laboratory studies were as follows: Hemoglobin 15.3 gm/100 ml, WBC 9,600/cumm. Roentgenograms of the chest and abdomen were negative except for the presence of the free air beneath both diaphragms. A gastrografin upper gastrointestinal study showed no perforation nor any other pathology.

Due to the patient’s lack of symptoms and physical signs, we elected to defer celiotomy and treat him conservatively. Nothing was permitted by mouth and he was given intravenous fluids.

In the succeeding week, he remained asymptomatic and had no positive physical or laboratory findings. Except for a few sigmoid diverticula, findings were normal in a gastrografin barium enema and in a subsequent examination with barium.

An intravenous pyelogram was normal. An upper gastrointestinal and small bowel series were normal and no diverticula were present. A

Figure 1
Chest x-ray on admission to the hospital (4-2-72).
bronchogram showed only the changes of chronic bronchitis.

The patient remained asymptomatic and was discharged on April 18, 1972, eleven days after the finding of free air under both diaphragms.

Review of Literature

Spontaneous pneumoperitoneum of undetermined origin has been reported in the literature. It is usually associated with severe symptoms and physical findings that demand exploratory laparotomy. However, in some cases, complete examination of the gastrointestinal tract during celiotomy has failed to demonstrate a site of perforation. The origin of the air in these cases has been ascribed to a small perforated duodenal ulcer, a minute leak from a diverticulum of the colon or small bowel, rupture of a basilar emphysematous bleb through the diaphragm, and insufflation of air by way of the female genital tract.
## Table 1

### SPONTANEOUS IDIOPATHIC PNEUMOPERITONEUM

<table>
<thead>
<tr>
<th>Case Number</th>
<th>Authors</th>
<th>Age &amp; Sex</th>
<th>Symptoms Prior to Admission</th>
<th>Symptoms at Time of Diagnosis of Pneumoperitoneum</th>
<th>Treatment</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Hinkel&quot;</td>
<td>70 F</td>
<td>Chronic cough</td>
<td>Severe epigastric pain Abdominal distention</td>
<td>Conservative</td>
<td>Improved &amp; Discharged</td>
</tr>
<tr>
<td>2</td>
<td>SideP</td>
<td>63 M</td>
<td>History of upper respiratory infections, LLL pneumonia</td>
<td>Abdominal distention</td>
<td>Conservative</td>
<td>Improved &amp; Discharged</td>
</tr>
<tr>
<td>3</td>
<td>Leys&quot;</td>
<td>30 F</td>
<td>Dyspepsia</td>
<td>Abdominal pain Pain left hemithorax</td>
<td>Conservative</td>
<td>Improved &amp; Discharged</td>
</tr>
<tr>
<td>4</td>
<td>Leys&quot;</td>
<td>60 F</td>
<td>Abdominal pain</td>
<td>Abdominal pain and distention</td>
<td>Laparotomy</td>
<td>Improved &amp; Discharged</td>
</tr>
<tr>
<td>5</td>
<td>Leys&quot;</td>
<td>35 F</td>
<td>Abdominal pain</td>
<td>Abdominal pain and distention</td>
<td>Conservative</td>
<td>Improved &amp; Discharged</td>
</tr>
<tr>
<td>6</td>
<td>Mason, et al&quot;</td>
<td>46 M</td>
<td>Chest pain and fever for 7 days, LLL pneumonia</td>
<td>Abdominal discomfort and distention</td>
<td>Conservative</td>
<td>Improved &amp; Discharged</td>
</tr>
<tr>
<td>7</td>
<td>Ayres&quot;</td>
<td>53 M</td>
<td>Abdominal pain</td>
<td>Epigastric pain</td>
<td>Conservative</td>
<td>Improved &amp; Discharged</td>
</tr>
<tr>
<td>8</td>
<td>Dodek&quot;</td>
<td>25 F</td>
<td>Severe pain right lower chest</td>
<td>Stabbing sensation in epigastrium</td>
<td>Conservative</td>
<td>Improved &amp; Discharged</td>
</tr>
<tr>
<td>9</td>
<td>Tratchman, et al&quot;</td>
<td>59 F</td>
<td>Recurrent abdominal pain suggestive of peptic ulcer</td>
<td>Abdominal pain</td>
<td>Laparotomy</td>
<td>Improved &amp; Discharged</td>
</tr>
<tr>
<td>10</td>
<td>Britt, et al&quot;</td>
<td>53 F</td>
<td>Two-year history of cough (Pulmonary tuberculosis)</td>
<td>None</td>
<td>Conservative</td>
<td>Improved &amp; Discharged</td>
</tr>
<tr>
<td>11</td>
<td>Mantel&quot;</td>
<td>70 F</td>
<td>Left lower lobe pneumonia 9 weeks prior to admission</td>
<td>Chest pain and abdominal distention</td>
<td>Laparotomy</td>
<td>Died of post-operative complications</td>
</tr>
<tr>
<td>12</td>
<td>Canavati and Fox</td>
<td>65 M</td>
<td>Cough for 3 weeks prior to admission</td>
<td>None</td>
<td>Conservative</td>
<td>Improved &amp; Discharged</td>
</tr>
</tbody>
</table>
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Table I summarizes the cases thus far reported where no possible source of the pneumoperitoneum could be found. Of the 12 patients, eight were female and four male. Ages ranged from 25 to 70 years. Prior to hospital admission, seven patients (58%) had respiratory symptoms and five (42%) gastrointestinal symptoms. At the time of the diagnosis of pneumoperitoneum, ten patients (83%) had gastrointestinal symptoms and two of these also had respiratory symptoms.

Two patients, including the present case, had no symptoms. Nine patients were treated conservatively. Exploratory laparotomy in three cases failed to reveal any cause for the pneumoperitoneum. One of the three patients died of pulmonary complications. All other patients were discharged from hospitals in good condition.

Comments

As stated earlier, pneumoperitoneum is a radiologic finding that usually indicates the presence of a ruptured viscus. The common causes of symptomatic pneumoperitoneum include perforated duodenal or gastric ulcer, ruptured gangrenous appendicitis, leaking diverticulum of the colon or small intestine or trauma producing rupture of the gastrointestinal tract.

Other less common causes are rupture of a Meckel's diverticulum, or perforation from ulcerative, granulomatous, amebic or ischemic colitis. In each of these diseases, pneumoperitoneum is accompanied by profound symptoms and physical signs of peritonitis. There is little doubt that immediate exploratory laparotomy and surgical correction are indicated.

Pneumoperitoneum may also be a complication of endoscopic examination such as sigmoidoscopy, colonoscopy or cystoscopy; perforation of a distended bowel during aspiration of fluid by paracentesis, or low thoracentesis in which the diaphragm is perforated and the peritoneal cavity entered. These procedures may be followed by peritonitis requiring surgical intervention and correction. (Air introduced into the peritoneal cavity for diagnostic and therapeutic reasons is of no concern in this discussion.)

Conclusion

Repeated questioning and physical examinations of our patient have disclosed no symptoms nor findings that might explain the origin of the air in the peritoneal cavity. Two complete roentgenographic examinations failed to demonstrate a pathological lesion. Bronchograms also were uninformative.

When free air is found under the diaphragm in symptomatic spontaneous pneumoperitoneum, immediate laparotomy is indicated. But, since neither signs of peritonitis nor symptoms suggesting involvement of the gastrointestinal tract were present in our patient, a nonoperative approach was followed. The abdomen was examined repeatedly to be sure the pneumoperitoneum did not progress and peritonitis did not develop.

The patient is still followed in the Outpatient Clinic. Repeated chest roentgenograms, as recently as January 31, 1974, have failed to reveal any recurrence of his pneumoperitoneum.
Canavati and Fox

References


