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Rare cause of acute surgical abdomen with free intraperitoneal air: Spontaneous perforated pyometra. A report of 2 cases

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Summary

Background:

The acute abdomen accounts for up to 40% of all emergency surgical hospital admissions and a large proportion are secondary to gastrointestinal perforation. Studies have shown the superiority of the abdominal CT over upright chest radiographs in demonstrating free intraperitoneal air. Spontaneous perforated pyometra is a rare cause of the surgical acute abdomen with free intraperitoneal air. Only 38 cases have been reported worldwide.

Case Report:

We report 2 cases of spontaneously perforated pyometra in our hospital's general surgery department. Both underwent exploratory laparotomy: one had a total hysterectomy and bilateral salpingo-oophorectomy, while the other had an evacuation of the uterine cavity, primary repair of uterine perforation and a peritoneal washout. A literature search was conducted and all reported cases reviewed in order to describe the clinical presentations and management of the condition. Of the 40 cases to date, including 2 of our cases, the most common presenting symptoms were abdominal pain (97.5%), fever (37.5%) and vomiting (25.0%). The main indication for exploratory laparotomy was pneumoperitoneum (97.5%).

Conclusions:

Pyometra is an unusual but serious condition in elderly women presenting with an acute abdomen. A high index of suspicion is needed to make the appropriate diagnosis.

key words:

acute abdomen • free intra-peritoneal air • pyometra

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BACKGROUND

The acute abdomen accounts for up to 40% of all emergency surgical hospital admissions; a large proportion are secondary to gastrointestinal perforation [1–3]. Common causes of pneumoperitoneum can be divided into intra-abdominal causes (eg, perforated peptic ulcer disease, perforated small and large bowel, iatrogenic pneumoperitoneum following laparoscopy) and extra-abdominal causes (eg, positive end expiratory pressure, pulmonary bleb rupture) [4].

Radiographic evaluation of the acute abdomen traditionally starts with a 3-view acute abdominal series, which consists of an upright chest radiograph, and upright and supine abdominal radiographs. However, studies have found this to be inadequately sensitive to evaluate pneumoperitoneum [5–8]. MacKersie et al. [5] found that the 3-view abdominal series had a sensitivity of 30%, a specificity of 88% and an accuracy of 56% in patients with non-traumatic acute abdominal pain. Helical computed tomography (CT) has since become the radiographic investigation of choice in evaluating the acute abdomen. Numerous studies have reported a diagnostic sensitivity of 95% to 98%, a specificity of 95% to 97% and an accuracy of 95.6% [1,7,9–13]. While the CT is excellent in detecting free intraperitoneal air, the location of the free air does not necessarily correlate with the site of perforation [12,13].

Pyometra, or pyometrium, is the accumulation of pus in the uterine cavity. It is an uncommon disease that occurs predominantly in post-menopausal women and is rare in the pre-menopausal age group [14]. Spontaneous perforated pyometra as a cause of acute surgical abdomen with free intraperitoneal air is rare.

We report 2 cases of acute surgical abdomen secondary to spontaneous pyometra perforation in our general surgical unit.

A PubMed search was conducted using the keyword 'pyometra' and English language articles were retrieved. A review of all cases was performed including the reviews by Yildizhan et al. [15] and Ou et al. [16] and we found an additional 2 cases of spontaneously perforated pyometra [17,18]. Only 38 cases of spontaneously perforated pyometra have been reported. Their clinical presentations and the management of this condition are subsequently described.

CASE REPORTS

Case report 1

An 89-year-old woman presented to our hospital with a 1-week history of abdominal pain and fever. Her gynecological history was unremarkable and there was no history of post-menopausal bleeding or vaginal discharge. On examination, she was appeared toxic – her body temperature was 38.3°C, her pulse rate was 95 beats per minute and her blood pressure was 130/70 mm Hg. Her abdomen was distended, with generalized tenderness.

Results of laboratory investigations on admission were as follows: hemoglobin 11.4 g/dL, white blood cell count $9.8 \times 10^3/\mu\text{L}$ with 87.4% neutrophilia. A plain chest x-ray

showed no free air under the diaphragm and an abdominal x-ray showed no intestinal obstruction. A CT scan with intravenous contrast showed free fluid in the peritoneal cavity, as well as several pockets of free peritoneal air, suggestive of perforative peritonitis. However, no obvious site of perforation was demonstrated. The endometrial cavity was noted to be distended with fluid and showed few locules of air suggestive of chronic pyometra.

In view of the above findings and investigation results, a clinical diagnosis of gastrointestinal perforation was made and the patient underwent an exploratory laparotomy the same day. She was also started on broad-spectrum antibiotics, ceftriaxone (Rocephin) and metronidazole (Flagyl). Intra-operatively, there was generalized purulent peritoneal soilage from a perforation in the uterine fundus. The gastrointestinal tract was normal. A total hysterectomy and bilateral salpingo-oophorectomy was performed. The intra-operative peritoneal fluid and uterine swab cultures grew *Escherichia coli*. Histological examination revealed pyometra with perforation. There was no evidence of malignancy.

Post-operatively, she was monitored in the surgical intensive care unit (SICU) for 4 days. Her stay in the SICU was complicated by septic shock, requiring inotropic support as well as fast atrial fibrillation and myocardial injury secondary to sepsis. She was eventually weaned off all respiratory and inotropic support and transferred to the general ward on post-operative day 3. She recovered well and was discharged to a community rehabilitation hospital on the 18th post-operative day.

Case report 2

An 87-year-old woman was admitted to our hospital with sudden onset abdominal pain of 1 day duration associated with cloudy and foul-smelling urine. There was no associated per-vaginal bleeding or discharge. On clinical examination, the patient was distressed and her vitals were as follows: temperature 37.5°C, pulse rate 98 beats per minute, blood pressure 179/64 mm Hg. The abdomen was distended, with generalized tenderness and absent bowel sounds.

Her admission investigations showed hemoglobin of 12.4 g/dL, total white cell count of $23.4 \times 10^3/\mu\text{L}$ and a urinalysis of 100 white blood cells/ μL . A plain chest x-ray showed no sub-diaphragmatic free air and the abdominal x-ray was unremarkable. She was admitted to the medical ward with a clinical diagnosis of a urinary tract infection.

In the general ward, she was noted to have progression of her abdominal pain, with development of rebound tenderness. A CT scan of her abdomen showed pockets of intraperitoneal free air, predominantly in the upper abdomen and gallbladder fossa, as well as posterior to the duodenum with associated free fluid along the right paracolic gutter, suggestive of a duodenal perforation. She was started on broad-spectrum antibiotics and referred to the surgical team. An exploratory laparotomy was subsequently performed under the diagnosis of a gastrointestinal perforation. During laparotomy, generalized purulent fluid was found in the abdominal cavity. There was a 5mm pin-point perforation at the uterine fundus, with pus and stale blood within the uterus. There was no palpable uterine mass. The

gastrointestinal tract was otherwise normal. An intra-operative gynecology consultation was obtained and the uterine perforation was closed primarily after decompression. The intra-operative peritoneal fluid and uterine swab cultures grew *Enterococcus faecalis*.

The patient was transferred to SICU post-operatively for respiratory and hemodynamic support. She was eventually extubated and weaned off all inotropic support on the 1st post-operative day. A vaginal speculum examination done post-operatively found no cervical lesion. Her post-operative recovery was complicated by ileus and atrial fibrillation secondary to sepsis. Due to the lack of a gynecological service in our hospital, she was transferred to the local gynecological hospital on post-operative day 13, after all acute issues had been resolved.

DISCUSSION

Pyometra is believed to be a result of interference with its natural drainage. Cervical occlusion may be caused by benign or malignant tumors of the cervix or uterus, radiation cervicitis, atrophic cervicitis, infection, traumatic damage to the cervix, or congenital anomalies of the genital tract [19].

Pyometra is a serious medical condition due to its association with malignancy. Its reported incidence in post-menopausal women is 0.2%, but among those with an associated uterine malignancy its reported incidence is 1.5% to 4% [14,19]. Its complication of perforation carries with it significant morbidity and mortality.

Post-menopausal bleeding, purulent vaginal discharge and lower abdominal pain or uterine enlargement are said to constitute the classic symptoms in patients with pyometra [14,15,20,21]. However, more than 50% of all patients with non-ruptured pyometra are asymptomatic [21] and it is frequently an incidental finding at post-mortem examinations [22]. Spontaneous uterine rupture is rare. Only 38 cases of spontaneous perforation of pyometra have been reported [15–18], of which 36 have been included in the reviews by Yildizhan et al. and Ou et al. Ou et al. had the largest number of reported patients with spontaneous perforation of pyometra treated in a single centre to date, where out of the 20 women with pyometra, 6 were perforated [16].

The diagnosis of spontaneously perforated pyometra was made only intra-operatively in most cases where the original clinical diagnosis was a gastrointestinal perforation [16]. Of the 40 cases to date, including 2 of our cases, the most common presenting symptoms were abdominal pain (97.5%, 39 cases), fever (37.5%, 15 cases) and vomiting (25.0%, 10 cases). The main indication for exploratory laparotomy was pneumoperitoneum, which accounted for 97.5% of the cases (39/40 cases).

Pyometra should be considered as an abscess and be treated promptly and aggressively [14]. Proper drainage and evacuation of the uterine cavity is of utmost importance, following which adequate drainage should be maintained, either by leaving a drain in the uterine cavity or by repeatedly dilating the cervical canal. Curettage of the uterine cavity after dilatation and drainage is essential to exclude any associated malignant disease and to remove any necrotic tissue. Appropriate specimens for culture should also be obtained

and broad spectrum antibiotics administered. Once the infection is controlled, the underlying problem can be treated. The treatment of perforated pyometra should be immediate laparotomy, peritoneal lavage and drainage and/or simple hysterectomy [19].

CONCLUSIONS

Ruptured pyometra is an unusual but serious condition in elderly women presenting with an acute abdomen. Therefore, a high index of suspicion is needed to make the appropriate diagnosis, especially in those with malignant disorders of the genital tract.

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