

Primary Peritonitis Secondary To Klebsiella Pneumoniae In A Healthy Individual - A Case Report And Literature Review On A Rare Event

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Citation

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Abstract

Primary or spontaneous bacterial peritonitis is a very rarely occurring event in an otherwise healthy, fit individual. It is mostly associated with patients with medical co-morbidities. Its pathogenesis is idiopathic and is a matter of different hypotheses. It is mostly encountered in female patients. The main causative bacteria of primary peritonitis reported in the literature have been *Streptococcus pneumoniae*, Group A *Streptococcus* (GAS), *Neisseria meningitidis*, nonenteric *Salmonella* and *Fusobacterium necrophorum*. We present a unique case of a healthy individual who had a primary peritonitis caused by *Klebsiella pneumoniae*.

A 43-year-old female was transferred to our hospital from a remote hospital on 10/12/2013 with a suspected perforated appendicitis. She had a 24-hour history of a sudden-onset lower central abdominal pain with subsequent generalisation. It was her first pain episode of that sort which was associated with fever, nausea, vomiting, diarrhoea, abdominal distension and diaphoresis. She had recently started her menstrual cycle. She claimed no previous ill health of any sort except two caesarean sections and permanent sterilisation. She did not take any regular medications and occasionally smoked.

On examination in the emergency department she had a peritonitic facies with mild dehydration, tachypnoea (respiration rate - 25), tachycardia (pulse rate - 130) and a pain score of 8 out of 10 (1-4 = mild pain, 5-7 = moderate pain, 8-10 = severe pain). Her arterial oxygen saturation was 98% on 2 litres of oxygen via nasal prongs; her blood pressure was 132/62mm Hg and her temperature 37.2 degree Celsius. Her abdomen had generalised tenderness, rigidity and reduced bowel sounds. Vaginal and rectal examinations were unremarkable.

Her biochemical markers showed the following:

Hb = 135, WCC = 2.3 (low), Neutrophils = 1.87 (low), Platelets = 264, CRP = 409 (high); normal renal and liver function tests. Her pregnancy test was also negative. Urine microscopy and subsequent culture did not yield any growth. Blood culture was also negative.

A rapid fluid resuscitation was followed by a CT scan which showed widespread four-quadrant intra-abdominal fluid without any pneumoperitoneum. The appendix was not identified. Segments of thickened mid small bowel and caecum were seen. There was no visible source of perforation or foreign body seen.

Figure 1

Free fluid in the right subdiaphragmatic space



Figure 2

Free fluid in the right paracolic gutter and upper abdomen; thickened small bowel wall



She was commenced on empirical triple intravenous antibiotics (Ampicillin, Gentamicin and Metronidazole) and was taken to the operating theatre urgently. A laparoscopic approach was made, where a very frank purulent fluid was encountered as soon as the umbilical port incision was made. It was swabbed and few millilitres were taken for culture. Laparoscopy showed four-quadrant frank purulent fluid with fibrinous exudates over liver and bowels.

Figure 3

Purulent fluid with fibrinous exudate in the right side of the pelvis

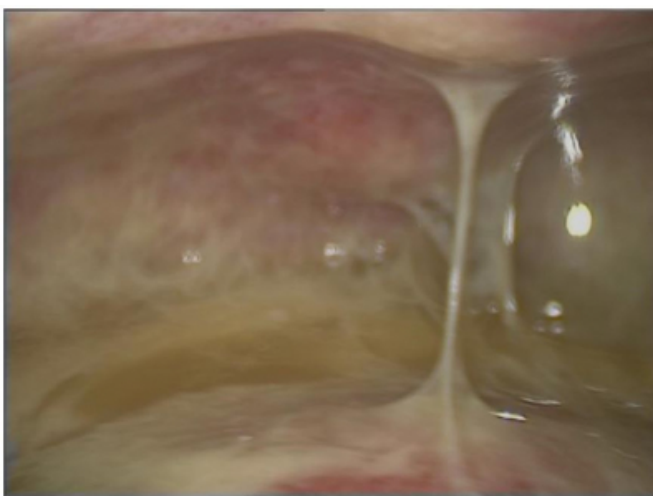


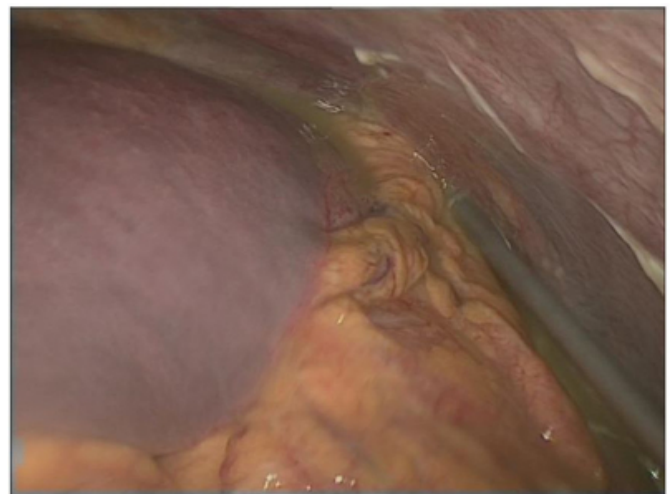
Figure 4

Purulent fluid and exudate in the central pelvis



Figure 5

Purulent fluid in the left upper quadrant



A thorough exploration was done including the appendix, small and large bowel, uterus and appendages, gall bladder, stomach and duodenum for any perforation or abnormality, but none was found. There was no evidence of feculent or biliary spillage. The appendix was left intact. The peritoneal cavity was lavaged thoroughly with at least 12 litres of warmed normal saline. Two large bore drains were left behind subhepatically and in the pelvis.

Postoperatively she was continued on triple IV antibiotics and allowed oral intake. She had a smooth convalescence period. The first drain was removed on the third day and the second one on the sixth day prior to her discharge. The culture on peritoneal fluid and swab grew *Klebsiella pneumoniae* sensitive to gentamicin, cefazolin and co-

trimoxazole and resistant to ampicillin and amoxicillin. She was discharged on oral cefalexin with a plan for surgical clinic follow-up.

DISCUSSION

Primary peritonitis in an otherwise healthy individual is an event that seldom occurs. It comprises less than 1% of peritonitis [3]. Literatures we have come across so far have only reported around 50 such cases [1]. It is more common in patients with other medical co-morbidities such as hepatic cirrhosis with ascites, nephrotic syndrome, autoimmune disease and immunocompromised conditions like systemic lupus erythematosus (SLE) and acquired immunodeficiency disease syndrome (AIDS).

Its pathogenesis is idiopathic and controversial, and has different hypotheses. The main route of infection is said to be via genital tract and GI tract, or blood borne from the respiratory tract. It is mostly encountered in female patients. The main causative bacteria of primary peritonitis reported in literature are *Streptococcus pneumoniae*, Group A *Streptococcus* (GAS), *Neisseria meningitidis*, non-enteric *Salmonella* and *Fusobacterium necrophorum* [1].

Klebsiella pneumoniae has been mentioned sparsely by some authors [2] as the agent for idiopathic intra-abdominal abscess, but we believe our case is one of the very rare ones, if not the first one, to have primary peritonitis secondary to *Klebsiella pneumoniae*. It is usually a normal commensal of the gastrointestinal tract and mostly causes UTIs, respiratory tract and neurological infections. Our patient did not have any physical evidence of bowel perforation and therefore her primary peritonitis related with *Klebsiella* is surprising.

The clinical presentation of peritonitis can be anything from generalised abdominal pain and tenderness to evidence of septic shock. A very low threshold for emergency operation is a must. A prompt resuscitation is life saving and preoperative CT imaging of the abdomen is very helpful, provided the patient is hemodynamically stable while waiting for operation. Primary peritonitis is almost always diagnosed retrospectively, once the secondary causes are

excluded on the operating table [4].

The preference of laparoscopic approach or laparotomy purely lies in the experience and the choice of the surgeon in immediate attendance of the patient. Farooq and Ammori [5] advocate the usefulness of laparoscopy as a diagnostic tool in the management of generalised peritonitis. We approached laparoscopically because the patient had a virgin abdomen, CT scan did not identify the source of peritonitis and the attending surgeon is very well experienced in minimally invasive surgery.

In conclusion, primary peritonitis is very rare. We have reported a unique case of *Klebsiella pneumoniae* related primary peritonitis in a very fit and healthy individual without any underlying co-morbid conditions. We recommend surgical approach according to the surgeon's choice. Once the patient with general peritonitis is examined and resuscitated promptly, the attending physician should have a very low threshold for immediate operation. Usually the outcome is excellent after surgery.

References

1. Elkassem S, Dixon E, Conly J, Doig C: Primary peritonitis in a young healthy woman: an unusual case. *Can J Surg*; 2008; 51: E40-41.
2. Ajao OG, Ajao OA: Idiopathic intra-abdominal abscess. *Trans Roy Soc Trop Med Hyg*; 1982; 76: 75-6.
3. Park JY, Moon SY, Son JS, Lee MS, Jung MH: Unusual primary peritonitis due to *Streptococcus pyogenes* in a young healthy woman. *J Korean Med Sci*; 2012; 27: 553-555.
4. Brivet FG, Smadja C, Hilbert U, Vons C, Jacobs F, Gordji-Therani H, Musset D: Usefulness of abdominal CT scan in severe peritoneal sepsis linked to primary peritonitis. *Scand J Infect Dis*; 2005; 37: 76-8.
5. Farooq A, Ammori BJ: Laparoscopic diagnosis and management of primary bacterial peritonitis. *Surg Laparosc Endosc Percutan Tech*; 2005; 15: 36-7.
6. Rivers E, Ngyuen B, Havstad S, Ressler J, Muzzin A, Knoblich B, Peterson E, Tomlanovich M; Early Goal Directed Therapy Collaborative Group: Early goal directed therapy in the treatment of severe sepsis and septic shock. *N Engl J Med*; 2001; 345: 1368-77.
7. Laroche M, Harding G: Primary and secondary peritonitis: an update. *Eur J Clin Microbiol Infect Dis*; 1998; 17: 542-50.
8. Mathews P: Primary anaerobic peritonitis. *BMJ*; 1979; 2(6195): 903-4.

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