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Case Report

Acute Abdomen in Meningococcemia - A Case Report and Literature Review

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Abstract

In this moment only 16 cases of any etiology of peritonitis with *Neisseria meningitides* (*N. meningitides*) have been reported since the first case in 1917.

We report the case of a 42 years old woman with peritonitis with *N. meningitides* and acute appendicitis, complicated by a bacteremia with *N. meningitides* without neurological signs and with an identified entry point at genital level.

Keywords: *Neisseria meningitides*; Peritonitis; Appendicitis; Appendectomy; Meningococcemia; Contraceptive Intrauterine Device

Abbreviation

N. meningitides: Neisseria meningitides

Introduction

N. meningitides is considered to be a normal commensal of the mucous membranes. It is a very rare bacteriological finding in the peritoneal liquid with only 16 cases reported in the literature since 1917.

Case Report

The patient was a 42-year-old white female with no medical history, either than the insertion of a contraceptive intrauterine device 3 months before the apparition of symptoms. She was accepted in the Emergency Department, for continuous abdominal pain in the right flank and right inguinal fossa since one day accompanied by fever (39°C).

On admission, his vital signs were temperature 37.8°C under Paracetamol 1g 4x/day, blood pressure 153/73 mm Hg, regular pulse at 100/minute, and respiratory rate of 24/minute. She presented no meningeal signs, no nausea, no vomiting. The abdomen was soft, with normal bowel sounds, but tender in the right flank and right inguinal fossa, without rebound.

The blood test showed a white blood cell count at 19.20 K/~L and a CRP 14mg/dl.

The urinary bacteriological examination was normal.

The abdominal CT scan showed no pathological findings other than the infiltration of the mesoappendix.

We proceeded to a classical 3 trocars laparoscopic appendectomy. The per operatory findings were multiples adherences in the right flank between the bowels, epiploon and the parietal perito-

neum. The appendix presented hyperemia and some cloudy-white liquid was found in the Morrison. The same liquid, in smaller quantity is also found in the Douglas. The liquid was send to our laboratory for further exams. The inspection of the peritoneal cavity showed no other pathologic findings, no stomach or bowel perforation, the ovaries and uterus are visualized and seem normal.

After abundant peritoneal lavage we proceeded to the laparoscopic appendectomy and a drain in the peritoneal cavity was placed.

The clinical condition of our patient dramatically improved directly after the surgical intervention, with decreasing of the pain and apyrexia.

The lab results showed the presence of the *Neisseria meningitides* group C in the intraperitoneal liquid as the only germ. The hemocultures showed the same bacteria.

The patient had Augmentin 1g 4x/day for 2 days (day 0 and day 1 after the surgery) and after the identification of the *N. meningitides* Ceftriaxone 2 g/day along with the usual painkillers and non-steroidal anti-inflammatory drugs.

After further discussion with our infectiologist and gynecologist team, we decided to remove the contraceptive intrauterine device, for which the bacteriological findings were some rare colonies of multisensitive Enterococcus faecium. The microbiological samples from the vagina and the cervix were normal.

The intravenous antibiotic therapy lasted for 10 days and we decided to stop it after the normalization of the blood test and the resolution of the bacteremia (after two negative hemocultures).

The patient was discharged from the hospital after 12 days with appointments in ambulatory consultation of surgery, infectious diseases and gynecology.

The anatomopathological result of the appendix was acute appendicitis with no signs of perforation or malignancy.

The contraceptive intrauterine device was send for further analysis and it came back positive for PCR of *N. meningitides*.

We reviewed the patient, for the moment, after a week and after a month after her discharge and she remains asymptomatic, no wound infection, no incisional hernia, the blood tests and the gynecological exam are normal.

Discussion on the Reported Cases

N. meningitides may be part of the nasopharyngeal flora in normal individuals.

It is not part of the normal gastrointestinal flora, but has been associated with sexual transmission. Probably due to the practice of oral sex, the mucous membranes of the cervix, urethra or anus have become a potential infection site for this bacterium. Inserting a contraceptive intrauterine device, can alter the protective barrier of the endocervical mucosa, allowing for bacterial infection and systemic spread.

A review of all cases of N. meningitis peritonitis in the world literature revealed only 16 cases since the first report in 1917.

The first two case reports occurred in the preantibiotic era [1-3].

The first case was a young soldier who presented with meningitis, developed peritonitis, and died with peritonitis after laparotomy [2].

The second case presented with peritonitis and recovered spontaneously [3].

Eleven of the patients were under age 35 at the time of presentation, most of whom presented with abdominal findings suggesting either peritonitis, ascites, or surgical abdomen [2-11].

In 5 of the 16 cases of peritonitis, patients had alcohol abuse complicated by ascites and cirrhosis [6,12-14]. The two patients with cirrhosis were initially diagnosed as having spontaneous bacterial peritonitis and died of their infections [13,14].

One patient with systemic lupus erythematosus on steroid therapy presented with a surgical abdomen and was subsequently found to have N. meningitis peritonitis [7].

Three other patients presented primarily with abdominal symptoms [6,9,10]. One patient had mesenteric lymphadenitis due to direct extension through an inflamed ileum caused by transient meningococcemia seeding of the bowel and peritoneum [10]. This patient recovered with intravenous penicillin G. Another patient

had a ruptured infected pancreatic pseudocyst as the source of his N. meningitis peritonitis [6]. Despite surgical treatment and antibiotics, the patient died. A third patient presented with endometritis, salpingitis, and peritonitis. N. meningitis was identified by culdocentesis and the patient responded to antibiotic therapy [9].

In only 2 of the 16 cases was meningitis the initial presentation [8,11]. These cases were associated with younger patients and occurred during epidemic meningococcal disease. Peritonitis in these patients was presumably secondary to hematogenous dissemination of the organisms.

Of these 16 cases previously reported, 9 recovered [3-8,10-14]. Most of the patients who recovered were younger, did not have complicating alcohol abuse, and presented with symptoms localized to the abdomen.

The first case of meningococcal (*N. meningitides* group Y) sepsis after contraceptive intrauterine device insertion was described 2013 by a team of gynaecologists [16]. So, even though contraceptive intrauterine devices rarely cause significant infection, physicians should consider this device as a possible source of infection, in reproductive-age women with the clinical features of sepsis.

The first case of *Neisseria meningitides* causing peritonitis in a peritoneal dialysis patient has been reported in March 1994 and showed that N. meningitis should be considered as another rare cause of peritonitis in patients on Continuous Ambulatory Peritoneal Dialysis [15]. Despite rapid administration of appropriate antibiotics with removal of the catheter, the patient continued to have progressive deterioration. It is likely that his underlying malnutrition contributed to his eventual demise.

In our case we think that the appendicitis was due to the inflammation in the peritoneal cavity with entry point from a contraceptive intrauterine device.

Conclusion

N. meningitides is rarely found in case of peritonitis.

The treatment rests on surgical lavage and cephalosporin 3rd generation.

The clinic may mimic ''the usual case" of acute abdomen, but without the complete correct diagnosis the rate of complications and death is very big.

That's why, one should consider it when confronted with an acute abdomen in a young women with a contraceptive intrauterine device in place, keeping in mind that peritoneal infection with *Neisseria meningitides* is also possible in male patients.

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