



Case report

Pasteurella multocida bacteremia: A case report of pelvic cavity inflammation with abnormal uterine bleeding, fever, and sclerotic bone lesions

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ABSTRACT

Background: *Pasteurella multocida*, is a bacterium that is frequently transmitted to humans from domestic pets. Infections are generally localized, but previous reports have exhibited that *Pasteurella* can cause systemic infections such as peritonitis, bacteremia and in some rare cases tubo-ovarian abscess.

Case presentation: We present a case of a 46-year-old woman who came to the emergency department (ED) with complaints of pelvic pain, abnormal uterine bleeding (AUB), and fever. A non-contrast computed tomography (CT) of abdomen and pelvis showed uterine fibroids with sclerotic changes in lumbar vertebrae and pelvic bones causing a high degree of suspicion for cancer. On admission, blood culture, complete blood count (CBC) and tumor markers were drawn. Additionally, an endometrial biopsy was performed to rule out the possibility of endometrial cancer (EC). The patient underwent an exploratory laparoscopy with hysterectomy and bilateral salpingectomy. After diagnosis with *P. multocida* the patient was treated with five days of Meropenem.

Conclusion: There are few cases of *P. multocida* peritonitis reported; in addition, findings of AUB with sclerotic bony changes in a middle-aged woman is often associated with EC. Thus, clinical suspicion from patient history, infectious disease work-up and diagnostic laparoscopy are essential for proper diagnosis and management.

Background

P. multocida, a gram-negative facultative anaerobic coccobacillus bacterium, is one of the most prevalent pathogens for humans [1]. They colonize the nasopharynx and gastrointestinal tract of many wild and domestic animals, including pets such as dogs and cats. Most commonly, a person gets infected after a pet bite or scratch, or after the licking of an open wound. This pathogen can cause a wide variety of human conditions ranging from soft tissue infections like cellulitis, to more severe infections like pneumonia, septic arthritis, prosthetic joint infection, peritonitis, and meningitis, however these are rare as most *Pasteurella* cases cause localized infections [2–6]. Here we present a case of a 46-year-old woman who presented with a significant pelvic cavity infection initially misdiagnosed as metastatic endometrial carcinoma.

Case presentation

A 46-year-old Hispanic woman presented to our ED with a chief

complaint of fever, AUB, abdominal pain and nausea. In the ED her vital sign was labile: her temperature was 98.3–101.8 F and pulse was 99–120 bpm while her systolic blood pressure (SBP) ranged from 93 mmHg to 134 mmHg. On review of systems the patient reported fever, chills, sweats, constipation, abnormal uterine bleeding, and pelvic pressure. In the ED, the patient was treated with ceftriaxone and metronidazole due to clear signs of infection with elevated white blood count (WBC), (15,320 mm³), c-reactive protein (18.33 mg/dl), procalcitonin (0.25 ng/ml), and lactic acid (1.1 mmol/L). On physical exam the cervical os was slightly dilated with normal appearance of cervix and vagina. The patient exhibited abdominal guarding; however, she denied any cervical motion tenderness. She initially presented to a neighboring hospital the night before, and a non-contrast CT scan of abdomen and pelvis showed a uterus with multiple fibroids, soft tissue stranding with thickening involving the omentum of the anterior abdomen suspicious for omental caking or possible carcinomatosis. Another significant finding was multiple sclerotic lesions in the lower lumbar spine and pelvic bones. Normal appearance of liver, pancreas and spleen was

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noted. Her physical presentation plus diagnostic imaging findings in a prepubertal middle-aged woman with AUB raised a high suspicion for EC with bone metastases [7].

The patient has a past medical history of uterine fibroids status post myomectomy in 2008. Corresponding with a lifetime of irregular and longer menstrual periods. Patient has a history of iron deficiency anemia and subsequently been on iron supplementation for the last 10 years. Patient also has a history of nulliparity and an entire lifetime of infertility. She has no prior history of sexually transmitted diseases or abnormal pap smear findings. To ensure the immunocompetency of the patient a HIV Antibody/antigen combo was ordered and found to be nonreactive in this patient. Liver function tests were unremarkable with AST and ALT within normal limits on admission as well as throughout her stay. ALT was 17 units/L on 08/24/2021 and AST and ALT were 13 units/L on 08/26/2021. Her physical presentation plus diagnostic imaging at the time pointed to endometrial carcinoma with metastasis to the vertebrae and pelvis as the leading diagnosis. A repeat CT of abdomen and pelvis with oral and intravenous contrast was ordered to get a clearer picture of the original imaging findings. Multiple sclerotic bone lesions were again seen, with a small amount of mesenteric fat stranding in the left anterior abdomen soliciting concern for peritoneal carcinomatosis. Small fluid collection in the left pelvis could be related to left adnexa or small abscess. Multiple uterine lesions were also found, which could likely be fibroids. The normal size and attenuation of liver and spleen were noted furthermore ruling out cirrhosis and suggesting immunocompetency of the patient.

Bone scan results showed no scintigraphic evidence of osseous metastatic disease. For good measure an MRI of the spine with and without IV contrast was also performed, which showed presence of hemangioma within L4 measuring 13 mm. Additionally, 2 masses in the L2 vertebral body measuring 9 mm and 8 mm were also found. These are of low signal on all imaging sequences and demonstrate no enhancement, subsequently concluding that these vertebral findings were more consistent to be bone islands.

As there were no clear explanations for her clinical findings, the patient was taken for diagnostic laparoscopy to rule out carcinomatosis, despite negative tumor markers and exclusion of metastasis. Upon laparoscopic visualization, diffuse abdominal pelvic inflammation was apparent. Inflammation adhered the rectosigmoid colon to the posterior uterus, which explains her symptoms of constipation. Uterus was found to be asymmetrical due to the presence of fibroids and was adhered to the bladder. Keeping in mind the ongoing uterine bleeding, inflammation and the patient's wishes, a hysterectomy with bilateral salpingectomy was performed. The surgical pathology results revealed an upper vaginal lesion consistent with benign fibroepithelial polyp. The surgical sample of uterus and fallopian tube showed leiomyomata, adenomyosis, benign cervix, endocervix, endometrium and bilateral fallopian tubes. The nodules excised from the posterior cul-de-sac were necrotic with marked inflammation, and organized hemorrhage and fibrin.

After three days of incubation, blood cultures revealed *P. multocida* as the source of infection; making the diagnosis of *Pasteurella* peritonitis, which is rare, and seen mostly in immunocompromised patients. [8] Antimicrobial susceptibility testing for *Pasteurella multocida* was carried out against meropenem, bactrim, ceftazidime, ceftriaxone, levofloxacin and tetracycline. Kirby-Bauer test suggested susceptibility of most of the above-mentioned antibiotics, however minimum inhibitory concentration (MIC) determined using dilution exhibited excellent potency of meropenem. Based on the patient's prior history of urticarial reaction from Penicillin exposure along with antimicrobial susceptibility testing, we were suggested to utilize meropenem by Infectious Disease (Table 1).

Upon reassuring the patient that she did not have endometrial cancer with metastasis like her physical presentation plus diagnostic imaging had prematurely led many to believe, we got a thorough history on how the patient acquired a *Pasteurella* infection. The patient admits to housing and fostering dogs in her free time but denies any recent history of dog bites.

Table 1
Antimicrobial susceptibility testing for *Pasteurella multocida*.

Pastuerella multocida			
Drug	MIC Interp	MIC Dilutn	KB Interp
Ceftazidime	S	8	
Ceftriaxone			S
Levofloxacin			S
Meropenem	S	< =0.25	
Tetracycline			S
Trimethorprim/Sulfa			S

Discussion

P. multocida is a small, gram negative, non-spore forming, aerobic bacteria found in the GI and upper respiratory tract of cats and dogs. *P. multocida* infection, that generally causes soft tissue infections. These infections can cause serious complications such as osteomyelitis, necrotizing fasciitis, septic arthritis, at times septic shock, endocarditis and meningitis. [9,10]. There are very few instances of *P. multocida* causing infection of visceral organs, especially organs of pelvic cavity. First case report of *P. multocida* causing sepsis due to uterine abscess in a 54-year-old woman was reported in 2021; so far very few reports of *P. multocida* causing tubo-ovarian abscess are reported [11,12]. Often-times, bacteremia with pelvic and uterine inflammation by a rare pathogen can be missed. In this case, AUB and pelvic pain in a premenopausal woman with osseous sclerosis in the lumbar vertebrae and pelvic bones reasonably led many to believe the patient had cancer with bone metastases. Bone metastases at presentation with EC are rare, but their prognosis is very poor. Median survival in such cases has been reported to be 12 months which could be extended to 20 and 33 months with radiotherapy alone and multi-nodal treatment respectively [13].

In the wake of positive blood culture, pelvic and uterine infection and a medical history of ownership of pets, we could summarize it as a rare case of *Pasteurella* peritonitis, resulting from bacteremia. This was an unusual presentation because normally individuals with severe infection of *P. multocida*, like that in our patient, are either immunocompromised, of advanced age, or have a significant injury from an animal bite. However, our patient had neither of the three. *P. multocida* is susceptible to many antibiotics including penicillin, amoxicillin-clavulanic acid, piperacillin-tazobactam, fluoroquinolones, cephalosporins (third generation and later), carbapenems, doxycycline and trimethoprim-sulfamethoxazole. Due to a history of urticaria following exposure to penicillin, along with MIC susceptibility to meropenem the decision to treat with meropenem was made. [14].

Conclusion

Pasteurella bacteremia normally results from a localized infection such as septic arthritis, pneumonia, or cellulitis; but in some cases, can occur in the absence of a localized infection. In our patient, *Pasteurella* infection resulted in bacteremia without any apparent originating site. In addition, AUB, and sclerotic bone lesions on imaging in a middle-aged woman can present a good degree of confusion making diagnosis challenging. However, benign surgical pathology results eliminated the suspicion for cancer with metastasis. Careful history taking, and laparoscopic evaluation along with infection workup is warranted to successfully diagnose and treat.

Ethical approval

The authors have obtained the written consent from the patient.

Consent

Written informed consent was obtained from the patient for

publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

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Author contribution

Priya Mohan: Study design, data collections, data analysis, writing. Ashley Diaz: Data analysis, writing. Siwon Lee: Advising.

Conflicts of Interest

Authors state that they have no conflict of interest. Authors (Priya Mohan, Ashley R Diaz, and Siwon Lee) state that they have no conflict of interest.

Data Availability

Data supporting the findings of this study are available from the corresponding author upon reasonable request.

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