



PYOPERITONEUM SECONDARY TO PYOMETRA RUPTURE IN A CARCINOMA CERVIX PATIENT DUE TO ACTINOMYCES TURICENSIS AND PEPTOSTREPTOCOCCUS ANAEROBIUS : A CASE REPORT

Clinical Microbiology

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ABSTRACT

We present a rare case of Pyoperitoneum secondary to Pyometra rupture in a carcinoma cervix patient due to dual pathogens- Actinomyces turicensis and Peptostreptococcus anaerobius. Escherichia coli, Enterococcus species, Bacteroides fragilis and Peptostreptococcus species are among the most common organisms isolated from cases of Pyometra. Though Actinomyces turicensis, a Gram positive bacilli belong to the genus Actinomycetes can be part of the normal microbiome of the genital tract, it has been described as a potential pathogen in genital, skin and soft tissue, urinary tract infections and even bacteraemia. The patient responded well to Metronidazole and beta lactam-beta lactamase inhibitor combinations. Hence the pathogenic role of these pathogens should not be ignored especially in patients who are immunocompromised.

KEYWORDS

Pyometra, Carcinoma cervix, Actinomycetes.

INTRODUCTION

Pyometra, collection of pus in the uterine cavity, is an uncommon condition seen mainly among post-menopausal women, when the natural drainage from the uterine cavity is compromised. This may occur due to the stenosis of the cervical canal secondary to cervical carcinoma, as a sequela to amputation of cervix, a forgotten intrauterine device or due to post-menopausal involution of uterus. Clinical presentation of pyometra varies from fever, abdominal pain, vaginal discharge or post menopausal bleeding. However, more than 50% of all cases are asymptomatic. Spontaneous rupture of pyometra is a rare complication, the incidence being 0.01-0.5% of all gynaecological patients, and it clinically mimics gastrointestinal tract disease(1-3). Literature search has revealed Escherichia coli and Enterococcus species, as the predominant facultative anaerobes as well as Bacteroides fragilis and Peptostreptococcus species, being the most common obligate anaerobes isolated from cases of Pyometra(4). Here we report a case of pyoperitoneum due to Actinomyces turicensis and Peptostreptococcus anaerobius secondary to pyometra rupture in a patient with carcinoma cervix.

CASE PRESENTATION

A 50-year old woman, known case of diabetes mellitus on oral hypoglycemic agents, presented to the emergency department with abdominal pain and vomiting for the previous 5 days. Patient was normal 5 days back, when she developed abdominal pain which was diffuse in nature and not associated with aggravating and relieving factors. This was associated with non-projectile and non-bilious vomiting and contained food particles. The patient also gave history of constipation for the past 3 days.

On examination, the patient was conscious, oriented and was responding to commands. The patient was found to be anaemic and bilateral pitting pedal edema was present. There were no accompanying signs of icterus, cyanosis or clubbing. Vital parameters were stable except for mild tachycardia (pulse rate-110 beats/minute). Upon abdominal examination, umbilicus appeared to be in midline position and there were no visible skin changes or dilated veins. On palpation, there was diffuse tenderness, guarding and rigidity of the abdominal wall. There was no organomegaly or palpable mass. On auscultation, bowel sounds were found to be sluggish. Abdominal ultrasound results were suggestive of hollow viscus perforation. Based on this, a provisional diagnosis of perforation of hollow viscus with peritonitis was made and exploratory laparotomy was planned.

On opening the abdomen, 300-500 ml of pus was present in the

peritoneal cavity. The uterus was found to be enlarged and of 14 weeks gestational size. A rent was present over the right cornua extending to the right fallopian tube, and the right ovary appeared atrophic. Left fallopian tube was thickened and dilated. Bilateral parametrium was infiltrated. Rent was repaired and bilateral salpingectomy was performed. No Intra uterine device (IUD) was present. On per speculum examination, a friable exophytic growth of size 4X4 cm, hard in consistency, bleeding on touch, arising from both the lips of the cervix, extending to both parametria and on the right side up to the lateral pelvic wall and vaginal fornix, was found. On dilating the cervical internal os, 2 ml of frank pus was drained from the uterus. A biopsy was taken from the cervical growth and sent for histopathological examination. Pus drained from the peritoneal cavity was sent to the microbiology laboratory for both aerobic and anaerobic bacterial culture.

Investigations

Laboratory investigations revealed neutrophilic leukocytosis and low haemoglobin (Hb-7gms/dl). Biopsy from the cervical lesion had features suggestive of keratinizing squamous cell carcinoma stage III B.

Gram stain from the pus sample revealed presence of pus cells, short Gram-positive bacilli and Gram-positive cocci in pairs and chains. Sample was inoculated onto 5 % sheep blood agar, MacConkey agar and Brain heart Infusion broth for enrichment, all incubated at 37 ° Celsius. Simultaneously, the sample was also inoculated onto neomycin blood agar, 5 % sheep blood agar and phenyl ethyl alcohol agar and incubated for 48 hours in an anaerobic environment created using Gaspaks. In the anaerobic jar along with the Gaspaks, catalyst sachets containing palladium coated alumina pellets and an indicator control Bacteroides fragilis ATCC 25285 was also added. The palladium catalyst was activated by heating at 160 degree Celsius for 2 hours.

After 24 hours of aerobic incubation, blood agar showed 1-1.5 mm sized grey coloured, circular colonies without any zone of haemolysis. There was no growth on MacConkey agar. Gram stain from the colonies revealed short, thin curved non-sporing Gram-positive bacilli which were non-motile, non-acid fast, catalase positive and oxidase negative. The colonies were identified as Actinomyces turicensis by MALDI-TOF MS (Version 3.2, Biomerieux, France) and was resistant to Metronidazole 5 microgram disc by disc diffusion method.

At the end of 48 hours of anaerobic incubation, the indicator control proved satisfactory and all the three media showed two types of

growth. One was presence of 1-1.5 mm sized grey, circular colonies without any zone of haemolysis and the other one was 0.5-1 mm sized grey colonies. Gram stain from the first colony revealed Gram positive non-sporing bacilli and the second type of colony revealed Gram positive cocci in pairs and chains. Both the types of colonies were subjected to MALDI-TOF MS identification (Version 3.2, Biomerieux, France). It was identified as *Actinomyces turicensis* and *Peptostreptococcus anaerobius* respectively with confidence value of 99.9. Antimicrobial susceptibility was performed for *Peptostreptococcus anaerobius* and was found to be sensitive to Metronidazole.

Treatment

The patient was started empirically on injection Cefoperazone sulbactam sodium 2 gms IV 12 hourly and injection Metronidazole 500 mg 8 hourly for a period of 7 days followed by oral antibiotics T. Cefixime 200mg twice daily for 10 days and T.Metronidazole 400 mg three times daily for further 7 days.

Outcome and follow up

The post-operative period was uneventful and the patient improved clinically with surgical drainage, antibiotics and concurrent chemoradiation for cervical cancer was also planned.

DISCUSSION

Spontaneous rupture of pyometra is often difficult to diagnose pre operatively and clinically it commonly mimics generalized peritonitis secondary to gastrointestinal perforation. In our case also, patient presented with features of generalized peritonitis and abdominal ultrasound examination could just tell that it is a hollow viscous perforation and exploratory laparotomy only could detect the perforation of anterior wall of the uterus near the fundus, pyometra and pyoperitoneum.

The source of infection can be from the genital tract itself since both *Actinomyces* and *Peptostreptococcus* species are part of the normal microbiome of the genital tract. *Actinomyces* species are Gram positive, asporogenous anaerobic bacilli, belonging to the order Actinomycetales, and are usually part of the normal human microbiome of the oropharynx and urogenital tract. They are non-acid-fast with variable Gram stain morphology ranging from the characteristic long filamentous and branching forms to short coccobacillary forms. *Actinomyces turicensis* (relating to Turicum, The Roman name for Zurich, Switzerland) is a non-pigment producing aerotolerant species in the genus *Actinomyces*. It was first described in literature in 1995 by J.Wust et al., based on the 16SrRNA sequence analysis of some of the representative *Actinomyces* pyogenes like bacteria isolated from various sources(5). *A.turicensis* has been described as a potential pathogen in genital infections followed by skin and urinary tract infections (6). One publication describing the clinical spectrum associated with *A. turicensis* highlights 116 isolates of *A.turicensis* of which 56% were isolated from genital infections and skin infection and 5% from urinary tract infections. It has also been isolated from infections in other parts of the body like meningitis, breast abscess, scrotal and prostatic abscess, necrotizing soft tissue infections, hepatic abscess and even from bacteremia (7-10). *Peptostreptococcus* species are a heterogenous group of organisms that are often part of the human endogenous flora present mainly in the mouth, gastrointestinal and urogenital tract. But under immunocompromised and traumatic conditions, they can become real pathogens. They are the second most frequently isolated anaerobes and account for one quarter of anaerobic organisms isolated from various specimens often along with facultative anaerobes.

The virulence profile of *Actinomyces* is usually low and require damaged or broken mucous membrane or tissues to invade deeper structures and cause infection in humans. With the alteration in the normal genital flora in patients with malignancy, infiltration of the malignant cells into the endometrium, hormonal imbalance associated with the patients approaching menopause and the immunosuppression associated with diabetes mellitus and unrecognized carcinoma cervix as seen in this patient, these normally non-pathogenic organisms would have become the real pathogens. *Actinomyces* usually causes polymicrobial infection. In this case, presence of an obligate anaerobe *Peptostreptococcus anaerobius* would have enhanced the relatively low virulence profile of *Actinomyces turicensis* causing pyometra and eventual perforation by inhibiting the host defence. Though *Actinomyces* associated pyometra and genital tract infections are commonly associated with presence of IUD, in our case we could not find any IUD in our patient.

Studies by Smith et.al., showed that clinical isolates of *A.turicensis* respond well to beta lactam antibiotics and beta lactam plus beta lactamase inhibitor combination should be regarded as the first line treatment of choice(16). There are a number of species differences in response to the antimicrobial agents used. In our case, the patient was treated with beta lactam-beta lactamase inhibitor combination and metronidazole. The patient responded well with the above regimen plus surgical drainage and resection of the infected tissue. Though *Actinomyces* isolates are often resistant to Metronidazole and monotherapy with Metronidazole is usually not advised for suspected cases of infections due to *Actinomyces* species, it will help in clearing off associated obligate anaerobes and in this case, *Peptostreptococcus anaerobius*.

CONCLUSION

This case report highlights the importance of identifying the lesser known agents associated with Pyometra. It also demonstrates how organisms which are part of the normal microbial flora of the genital tract can act as real pathogens considering the underlying disease conditions. Reliable identification of Gram positive, non-sporing bacilli especially the aerotolerant ones to the species level is difficult in resource poor settings without the use of automated identification systems. Though mortality is uncommon with these infections, morbidity may be significant due to the chronicity of the illness. Post treatment monitoring and prolonged treatment is often necessary in these infections. Inadequate antibiotic treatment can often lead to relapses.

AUTHOR STATEMENTS

Authors and contributors

Maanasa Bhaskar- Contributed to Investigation, writing original draft.

Dijo Darjis -contributed to Investigation.

Rakhi Biswas- Contributed to Investigation and writing- review and editing of the original draft.

Parvathy T- Provided resources and was involved in the clinical management of the patient and added to the clinical data in the manuscript.

Sujatha Sistla- Review and editing of the original draft.

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