

Case Report

Pantoea dispersa: An unusual pathogen in the immunocompromised cases

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Abstract:

Pantoea dispersa, a natural inhabitant of plant surfaces, is a rare pathogen in clinical setting. The genus includes 20 different species. It has been reported to cause a variety of infections like cholangitis, respiratory infections, neonatal sepsis and blood stream infections, particularly in immunocompromised persons. We describe the clinical course of an elderly patient with carcinoma gall bladder presenting with cholangitis and having *Pantoea dispersa* bacteremia. The sensitivity profile was consistent with existing reports. He underwent endoscopic biliary drainage and antibiotic treatment with a favorable outcome. We have also summarized the existing literature on this rare organism, which in our case was isolated from a common situation.

Keywords; *Pantoea dispersa*, encapsulated bacilli, cholangiopancreatography

BACKGROUND

Pantoea dispersa is a gram negative, non-spore forming, encapsulated bacilli, colonizing plant surfaces, human feces and environment.[1] It is seldom encountered in clinical settings. Although there are instances of cases with *Pantoea dispersa* causing respiratory infection, neonatal sepsis and blood stream infections, *Pantoea* bacteremia has rarely been reported in immunocompetent hosts.[2]

CASE PRESENTATION

A gentleman in his early sixties presented with yellow discoloration of eyes and urine for 2 months. It was progressive and accompanied by itching over palms and soles as well as clay colored stools. He also had dull aching pain in right upper abdomen which did not radiate to the back or right shoulder. It lasted for minutes to hours and subsided with oral analgesics. His appetite decreased significantly and he lost significant weight over two months, although it was not measured. There was no history of vomiting, early satiety, easy bruising, bone pains or fractures, decreased vision in the dark or numbness of palms and soles. He did not have any history of intake of alternative medicines, comorbid disease, past surgeries, transfusions or addictions. He developed fever with chills 7 days after the onset of jaundice. He was evaluated by a gastroenterologist in his

hometown and diagnosed as having biliary obstruction due to possible gall bladder malignancy based on imaging findings of asymmetric gall bladder thickening with bilateral dilated intrahepatic biliary radicles (IHBRD). He underwent endoscopic retrograde cholangiopancreatography (ERCP) with biliary stenting. Fever subsided after ERCP along with an improvement in jaundice. However, two weeks later, fever and jaundice reappeared. He presented to our emergency with the above complaints. On clinical examination he had a temperature of 100.4-degree Fahrenheit, heart rate 60/min, respiratory rate 18/min and blood pressure 140/65 mm Hg. He also had scratch marks on his body and shiny nails. Abdominal examination revealed firm hepatomegaly with liver span of 16 cm. There were no palpable lymph nodes. His performance status according to the Eastern Cooperative Oncology Group (ECOG) scale was 3.

DIFFERENTIAL DIAGNOSIS

He was provisionally diagnosed with cholangitis because of a blocked biliary stent. In view of painful cholestatic jaundice with significant weight loss and loss of appetite, a malignant etiology of biliary obstruction was considered.

INVESTIGATIONS

His blood investigations revealed high leucocyte count, direct hyperbilirubinemia and high alkaline phosphatase, vide table 1. Ultrasonography showed dilated intrahepatic biliary radicles and thickening in the neck of gall bladder. Computed tomography scan of abdomen showed thickening of neck of gall bladder with bile duct stricture involving of primary confluence. There were liver lesions suggestive of metastasis, peri-portal lymph nodes. Fine needle aspiration cytology from gall bladder thickening was suggestive of adenocarcinoma.

TREATMENT

In view of a diagnosis of cholangitis, he was empirically started on Piperacillin-tazobactam after taking blood culture. He underwent ERCP within 24 hours of admission. Cholangiogram showed dilated intrahepatic bile ducts with biliary stricture involving primary biliary confluence. Bile was aspirated and sent for culture. Straight plastic stents were placed in the right and left hepatic ducts during ERCP.

Table I: Investigations

Parameters	At admission	At discharge
Hemoglobin(g%)	10.8	11.5
Total Leukocyte Count(*10 ³ /cmm)	16.8	5.68
Platelet(*10 ³ /cmm)	5.9	3.55
Bilirubin (Direct)(mg%)	12.1(5.8)	2.79(1.25)
AST(IU/L)	80	52
ALT(IU/L)	35	40
SAP(IU/L)	630	312
GGT(IU/L)	273	123
Serum Albumin(g%)	2.83	3.2
Blood urea(mg%)	41	39
Serum creatinine (mg%)	0.36	0.54
Serum sodium (meq/l)	136	137
Serum potassium (meq/l)	3.6	4.43

Blood culture showed the growth of *Pantoea dispersa* which was sensitive to piperacillin-tazobactam, carbapenem, cotrimoxazole and fluoroquinolones, but resistant to ampicillin, cefepime, cefuroxime. The bile culture did not yield any growth. Hyperbilirubinemia decreased but fever persisted for 48 hours after ERCP. Antibiotics were upgraded to Meropenem to which the fever responded. In view of metastatic disease and poor performance status he was offered palliative care. The plastic biliary stents were removed and uncovered biliary self-expanding metal stents were placed and patient was advised to follow up with department of medical oncology (Table 1).

Outcome and follow up

Till two months after discharge from our department, he was following with the department of Medical Oncology for palliative care. His bilirubin was normal.

Table II: Summary of literature review (including our patient)

Author(year)	Sex	Age	Site of infection	Underlying disease	Outcome
Schmid et al (2003)[5]	Female	71	Respiratory	AML	Improved
Mehar et al (2013)[6]	ND	Neonate	Bacteremia	SSS	Improved
Mehar et al (2013)[6]	ND	Neonate	Sepsis	SSS	Died
Hagiya et al (2014)[7]	Male	64	Blood stream	DCM	Improved
Panditrao M (2018)[8]	Female	28	Respiratory	VAP post LSCS sepsis	Died
Asai et al (2019)[2]	Female	38	Cholangitis	Choledocholithiasis	Improved
Yang et al (2022)[9]	Male	51	Bloodstream	Ruptured hepatocellular carcinoma	Improved
Present case	Male	63	Cholangitis	Carcinoma gall bladder	Improved

AML: Acute myeloid leukemia, SSS-Septic shock syndrome, DCM-Dilated cardiomyopathy, ND-Not described, VAP-Ventilator associated pneumonia, LSCS-Lower segment caesarean section

Table III: Sensitivity spectrum of *Pantoea dispersa* (including our patient)[2,5-9]

Antibiotics	No of isolates tested	No of isolates found sensitive
Ampicillin	8	7
Cefepime	5	3
Cefotaxime	5	4
Ceftazidime	5	3
Ceftriaxone	8	7
Fluoroquinolones	8	7
Piperacillin/Tazobactam	8	7
Meropenem	8	7
Imipenem	7	6
Aztreonam	4	3
Amikacin	5	4
Minocycline	2	2
Trimethoprim-sulfamethoxazole	4	4
Colistin	2	1
Tigecycline	2	2

DISCUSSION

Pantoea are yellow pigment producing rod-shaped gram-negative bacilli. First named as *Bacillus agglomerans*[1] Gavini et al later named it under genus *Pantoea* in family Enterobacteriaceae.[3]

Usually an inhabitant of plant and soil, *Pantoea dispersa* has rarely been isolated from human specimens. It was first isolated from bile in a patient with cholangitis complicating choledocholithiasis.[4] Since then eight cases have been reported worldwide including our patient, as summarized in Table II.[5-9] Most of the patients were in extremes of age. Of the total eight cases organism was isolated from blood in five cases. However, in two instances the bacterium was initially misidentified as *Klebsiella* by MALDI Biotyper and *Enterobacter* by VITEK MS system and later confirmed as *P dispersa* using 16s rRNA analysis. Surgical, endoscopic and endovascular interventions were reported in three patients

preceding isolation of the organism. Nosocomial spread via contaminated infusion sets, parenteral nutrition, intravenous fluids, blood products, inadequate hygiene like prolonged contact with fecal matter have been hypothesized to contribute to the spread of the infection.[9] The organism was sensitive to the commonly used antibiotics, viz. beta lactams, third generation cephalosporins, fluoroquinolones and carbapenems in most cases. Table III shows the drug sensitivity pattern as reported in the various cases. Except for two patients, all survived the infection (Table II and III).

CONCLUSION

P dispersa is a rarely isolated organism which has been found mostly in extremes of age. It has a favourable antibiotic sensitivity pattern and most patients have survived following treatment with antibiotics

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