Trueperella bernardiae bacteremia in paraplegic patient with polymicrobial infection

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Abstract

Trueperella bernardiae *is an infrequently identified Gram-positive bacillus that has been isolated in various clinical infections. Here we report a case of* T bernardiae *infection in a paraplegic male and report antimicrobial susceptibilities.*

Keywords: *Trueperella bernardiae*, polymicrobial infection, antibiotic resistance

Introduction

Trueperella bernardiae is a Gram-positive bacillus first described in 1987.[1] While it initially was believed to be non-pathogenic and was often considered a contaminant,[4] a select number of cases have suggested its pathogenicity in humans. Its relatively recent identification, difficult identification, and recent reports associated with various infections make *T. bernardiae* a poorly studied and possibly pathogenic organism. Given this, additional data are needed to both explain pathogenicity and determine resistance patterns. We present such a case of *T. bernardiae* infection in a paraplegic patient.

Case

A 50-year-old man with a past medical history pertinent for paraplegia, unstageable ischial pressure ulcers, bilateral staghorn struvite calculi (status post percutaneous nephrostomy 5 years prior to presentation, with multiple cystoscopies and bilateral stent placement), well-controlled type II diabetes mellitus, and chronic self-catheterization, presented with a several day history of right lower quadrant pain and general malaise. On arrival at the emergency department, the patient was tachycardic (116 heart beats per minute) and hypotensive (87/48 mmHg), requiring initiation of norepinephrine. Initial work-up was remarkable for leukocytosis (21.3 k/μL), hyponatremia (121 mmol/L), urinalysis consistent with infection, and acute kidney injury (creatinine of 2.88 mg/dL, with a baseline of 0.6 mg/dL; urea nitrogen 71 mg/dL, with a baseline of 13 mg/dL). An initial computed tomography scan of the abdomen and pelvis (CT-AP) showed bilateral non-obstructing kidney stones and moderate right hydronephrosis (Figures 1A and 1B). The scan also showed inflammatory stranding in the right abdomen and suspected small fluid collections between the liver and duodenum, consistent with xanthogranulomatous pyelonephritis with the development of perinephric abscesses.

Empiric antibiotic coverage was started with vancomycin and cefepime, and the patient was admitted to the intensive care unit. Urology placed a right double-J ureteric stent on day 2 of the hospital course. Vasopressors were weaned on day three. The hospital course was complicated by worsening abdominal pain and distention. An abdominal fluid collection was drained by interventional radiology. Leukocytosis persisted throughout the majority of the hospital course with a peak of 30.0 k/μL on day 5. Blood cultures from admission grew *Bacteroides thetaiotaomicron, Gemella spp. Escherichia coli,* and *Trueperella bernardiae* (Table 1)*,* and abdominal fluid cultures from the drainage grew *Enterococcus faecalis* group D.

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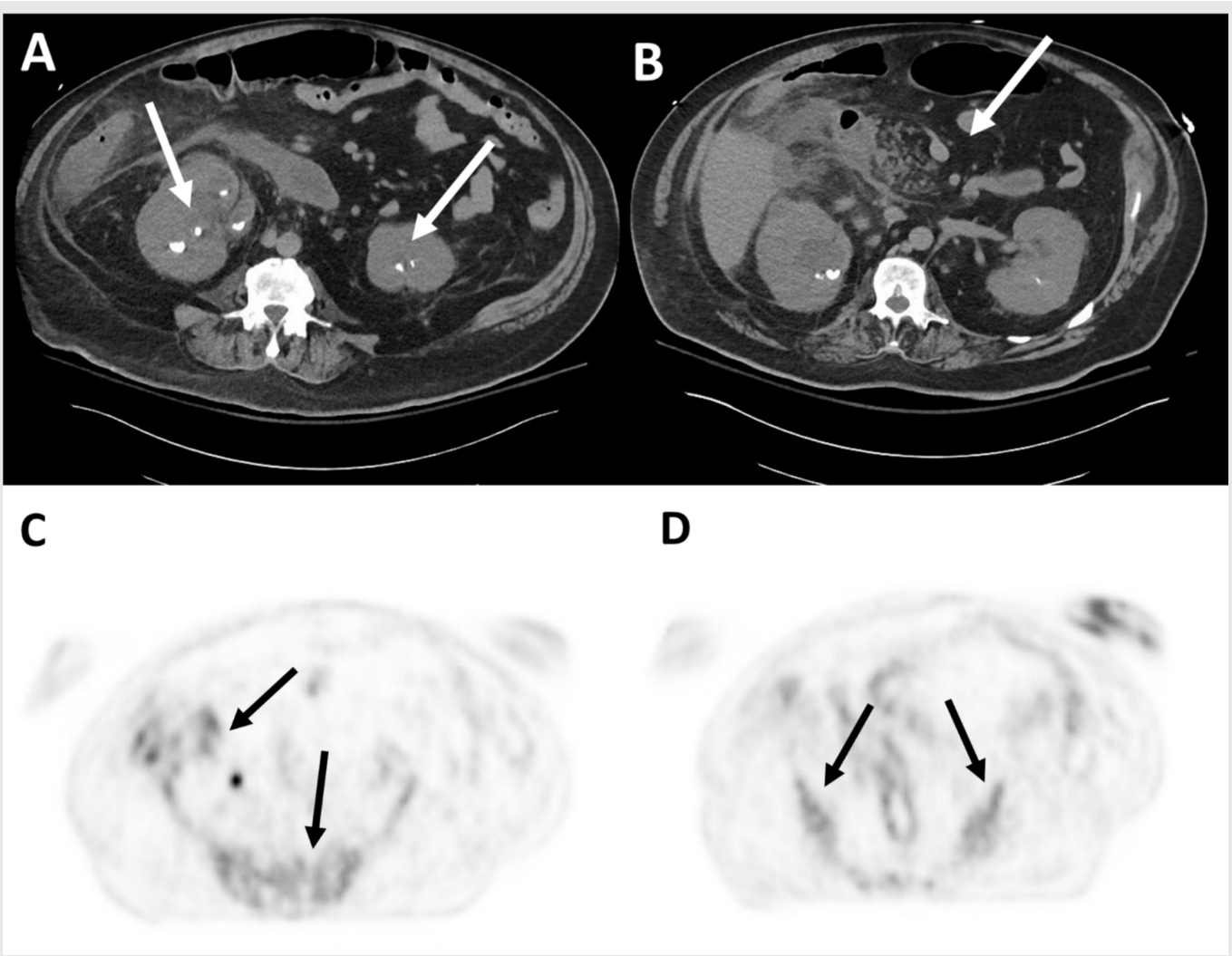

Figure 1. CT and PET Scan Imaging of Abdomen and Pelvis. Computed tomography of the abdomen and pelvis without contrast showing (A) non-obstructing kidney stones and moderate right hydronephrosis and (B) inflammatory stranding of the right abdomen and suspected small fluid collections between the liver and duodenum. PET scan (C and D) showing bilateral soft tissue defects in the buttocks extending to the inferior ischium, with possible periostitis versus early osteomyelitis.

Antibiotics recommended by the infectious disease consultants were adjusted throughout the hospital course as blood and abdominal fluid cultures resulted (Table 2).

A positron emission tomography (PET) scan on day 12 showed bilateral soft tissue defects in the buttocks extending to the inferior ischium, with possible periostitis versus early osteomyelitis (Figures 1C and D).

Bone biopsy was performed on day 14 and had no growth. Further work-up throughout his hospital course included a transthoracic echocardiogram and transesophageal echocardiogram, which did not show intracardiac thrombi, mass or vegetations. The

Table 1. *Trueperella Bernardiae* Susceptibilities

Antibiotic	MIC	Interpretation
Cefepime	0.5	Susceptible
Cefotaxime	< = 0.25	Susceptible
Ceftriaxone	< = 0.25	Susceptible
Clindamycin	< = 0.06	Susceptible
Daptomycin	>2	Nonsusceptible
Erythromycin	< = 0.06	Susceptible
Linezolid	1	Susceptible
Meropenem	0.25	Susceptible
Penicillin	0.25	Intermediate
Trimeth/Sulfa	< = 0.25	Susceptible
Tetracycline	1	Susceptible
Vancomycin	1	Susceptible

Trueperella bernardiae identification performed by mass spectrometry. Susceptibility testing performed by broth microdilution.

bacteremia source was considered multifactorial, including urinary and periostitis versus osteomyelitis. The patient was ultimately placed on intravenous (IV) ampicillin/sulbactam on day 12 and discharged on day 17 of the hospital course with a peripherally inserted central catheter for a planned 6-week IV antibiotic treatment. Repeat CT-AP one month after abdominal drain placement demonstrated greatly decreased fluid collection. Inflammatory markers however trended upwards and antibiotic course was extended an additional 2 weeks. He was transitioned to oral amoxicillin/clavulanate at week 8 while awaiting abdominal drain removal. The drain was removed by interventional radiology, and antibiotics were discontinued 8 weeks after discharge after 8 weeks of IV and 10 days of oral antibiotic therapy.

Table 2. Antibiotic Timeline

Antibiotic	Timeline	Total Duration
Cefepime	Day 1–6	6 days
Vancomycin	Day 1–4	4 days
Metronidazole	Day 4–12	9 days
Ceftriaxone	Day 6–12	7 days
Ampicillin/ Sulbactam	Day 12-past discharge	4–6 week course recommended

Discussion

Infections in paraplegic patients are of concern due to neurogenic bladder, the need for catheterization, and decreased or absent sensorium delaying the awareness of an infectious process.[2] In this patient, several sources of infection included urinary, soft-tissue, and bone infections. Pressure ulcer infections may also result in soft tissue and bone infections.[3] A variety of bacterial species were recovered from this patient's blood and abdominal fluid cultures. *Trueperella bernardiae*, formerly *Actinomyces bernardiae* and *Arcanobacterium pyogenes*, is a facultative anaerobic Gram-positive-bacillus.[4] First described in 1987 and described in human infections in 1995,[5] it was originally classified in the Actinomyces genus, then reclassified with Arcanobacterium in 1997, and finally within the Trueperella genus in 2011.[6] This organism has been notoriously difficult to identify; molecular and spectroscopy methods, such as matrix-assisted laser desorption/ionization time-of-flight (MALDI-TOF), significantly improve indentification.[4]

The pathogenicity of *T. bernardiae* remains uncertain, partly due to the scarcity of reports and its presence as normal flora.[7] Nevertheless, reported infections from this organism include post-op wound infection,[8] prosthetic join infection,[9] diabetic foot wound,[10] pyocystis in ESRD,[6] brain abscess,[11] septic olecranon bursitis,[12] and septic thrombophlebitis.[4] It has been isolated as a sole pathogen[9] and as part of polymicrobial infections.[13–15] Resistance is usually not an issue for this organism,[13] but resistance to ciprofloxacin,[16] penicillin G,[14] erthyromycin,[8,14,17] clindamycin,[8,17] norfloxacin,[18] fosfomycin,[18] trimethoprim-sulfamethoxazole,[17] pefloxacin,[19] and metronidazole[20] have been reported.

While it is not possible to determine the pathogenicity or pathophysiology of *T. bernardiae* from this report due to the polymicrobial infection, resistance patterns for this infrequently reported, though likely pathogenic, organism may help guide future

management. Physicians should consider this bacterium as a possible pathogen, the need for advanced identification methods, and possible resistance patterns.

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