Case Reports

Septic arthritis of the knee joint secondary to prevotella bivia

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ABSTRACT

تعتبر بريفوتيلا بيفيا ميكروبات لا هوائية سالبة الجرام والتي غالباً ما تنتج بي–لاكتاميس القابل للكشف. حتى هذا اليوم، تم الإبلاغ فقط عن ثلاثة حالات من الالتهاب المفصلي الإنتاني الناجم عن هذه الميكروبات الحية لدى المرضى قبل ظهور مرض المفصل الشديد والمصابين مثلاً بمرض الالتهاب المفصلي الروماتيزمي أو بعد تركيب مفصل اصطناعي بديل. نستعرض في هذا التقرير أول حالة تعاني من التهاب مفصلي إنتاني نتيجة للإصابة بميكروبات بريفوتيلا بيفيا، لدى مريض لا يعاني من أعراض قبل الإصابة بمرض المفصل.

Prevotella bivia is an obligatory anaerobic, gram-negative rod, which often produces a detectable beta-lactamase. To date, there has been only 3 descriptions of septic arthritis secondary to this microorganism in a patients pre-existing sever joint disease like rheumatoid arthritis and osteoarthritis or after joint prosthesis. We are reporting the first case of septic arthritis due to Prevotella bivia in a patient with no pre-existing joint symptoms.

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Prevotella bivia is an obligatory anaerobic, non-spore forming, nonmotile, and gram-negative rod. This microorganism is part of the normal vaginal flora and has been more frequently isolated in gynecological-obstetric infections. Septic arthritis due to Prevotella bivia has recently been reported in many occasions in patients with pre-existing joint diseases such as severe rheumatoid arthritis with chronic steroid therapy,[1] and in a prosthetic knee of a patient with polymyalgia rheumatica.[2] We describe in this report a case of septic arthritis due to Prevotella bivia in a patient with normal knee joint.

Case Report. A 76-year-old male patient who presented to the emergency room with 4 days history of progressive left knee pain, swelling and redness. Patient had no history of fever or trauma. He had long-standing history of diabetes that was managed by insulin. He was febrile (38.4°C) and his left knee was red and swollen. His right big toe was gangrenous. He had signs of peripheral neuropathy; otherwise, the systemic examination was within normal. The complete blood count, the renal and liver function tests were all within normal limits. Left knee joint x-ray showed large effusion containing air/fat density and mild degenerative articular changes. No other imagings were performed. The synovial fluid analysis on admission is shown in the following **Table 1**. The patient was admitted to surgical ward and intravenous cefazolin 2 grams every 8 hours was started empirically. Initial Synovial gram stain and culture were negative. Patient was not responding to medical treatment alone and 48 hours after admission; he underwent arthrotomy, drainage and debridement. Synovial fluid from knee joint was sent to microbiology who later reported a growth of anaerobic gram negative rods. The API 20 A identification system was used and the organism was labeled as Prevotella bivia. The ß-Lactamase production was positive. No further sensitivity was performed. Cefazolin was discontinued and Metronidazol 500mg intravenously twice daily was started for one week and oral Metronodazol 500mg

twice daily was commenced for total of 4 weeks. Six weeks after discharge, his follow up showed complete resolution of his signs and symptoms.

Discussion. Prevotella bivia is an obligatory *anaerobic*, non-spore forming, non-motile, gram-negative rod, (**Figure 1**) which often produces a detectable ß-lactamase.[3] This microorganism is part of the normal vaginal flora and has been more frequently isolated in gynecological-obstetric infections.[4] It has also been isolated and implicated in causing infections in post animal bites wounds and penile abscess.[5,6] To date, there have been several reported cases of infectious arthritis secondary to this microorganism. One case was in the knee joint of patient with severe, long-lasting rheumatoid arthritis treated with low doses of corticosteroids.[1] In 2 other cases, one was reported in a prosthetic knee joint of a patients with polymyalgia rheumatica, while the other was reported on the hip joint after an intra-articular steroid injection.[2,7] There have been reports of other *Prevotella spp* causing septic arthritis as well. *Prevotella loescheii* was associated with septic arthritis of the knee after tooth extraction in a patient with advanced arthrosis and after total hip arthroplasty.[8,9] Prevotella melaninogenicus was associated with septic arthritis of the sternoclavicular joint in a diabetic patient with liver cirrhosis.[10]

This is the first case of septic arthritis due to Prevotella bivia in a patient with apparently normal knee joint of a male patient. The patient was not symptomatic from his knee prior to presentation and with only mild degenerative changes observed radiologically. This is in contrast with other cases were the joint is usually affected severely with a disease process. The role of anaerobic bacteria in causing infectious arthritis, though rare, is well documented in the literature. The earliest documentation of anaerobes in causing septic arthritis was dated 1965 by Jansson et al.[11] The main anaerobes causing arthritis include anaerobic gram negative bacilli including Bacteroides fragilis group, *Fusobacterium* spp., *Clostridium* spp, and *Peptostreptococcus* spp. Most of the cases of anaerobic arthritis, in contrast to anaerobic osteomylitis, involved a single isolate.[12] Most of the cases of anaerobic arthritis are secondary to hematogenous spread.[13] Though the blood culture result obtained in our patient was negative, transient hematogenous spread is the most likely mechanism of acquiring infection in our patient. Local predisposing factors attributed to the etiology of anaerobic septic arthritis such as trauma, previous joint surgery, prosthetic joint, and peripheral vascular disease can lead to poor blood supply hasten the chance of developing anaerobic infection.[13]

Anaerobic organisms are thought to seed the joints either by local inoculation or transient bacteremia from a distant necrotic site. The presence of distant gangrenous necrotic tissue, recent odontologic treatment, or gynecologic exploration should raise suspension of anaerobic septic arthritis especially in the absence of good clinical response to traditional therapy and negative culture. The β-lactamase production is found in 76-84% of Prevotella bivia strains and seems to have an important role in the susceptibility to ß-lactam drugs.[14] The addition of ß-lactamase inhibitor provide better response to the antibiotic. Metronidazole remains a very effective drug that penetrates synovial fluid very well providing good concentrations sufficient to kill the microorganism.[15] Appropriate antibiotic therapy and surgical debridement are considered the gold standard treatment of septic arthritis caused by anaerobes.[12] however, there is no consensus on the duration of antimicrobial therapy or route of administration. In

Table 1 - Characteristics of patient's knee synovial fluid.

Measure	Patient investigations	Normal range
Appearance	Cloudy	Transparent
WBC (mm^3)	28889	<200
Polymorphs	(86)	<25%
Colour	Yellow	Clear
Gram stain	No organisms	None
Crystal	Not seen	None
Total protein (G/l)	69	10-20
Glucose (mmol/l)	0.2	Nearly equal to blood
LDH (compared to serum level)	5019 u/l	Very low

WBC - white blood cell, LDH - Lactate dehydrogenase

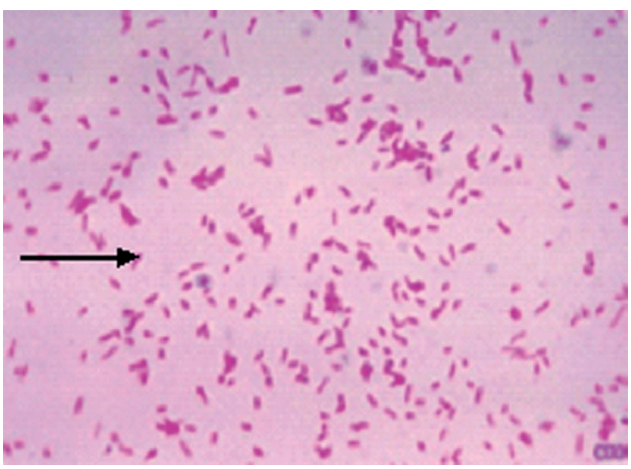

Figure 1 - Prevotella bivia: an obligatory anaerobic, non-spore forming, non-motile, gram-negative rod, which often produces a detectable ß-Lactamase.

our patient, oral route with a drug that is well absorbed and has a good penetration of synovial fluid resulted in complete resolution of inflammation.

In conclusion, Prevotella bivia can cause septic arthritis in a normal joint, and metronidazole orally may provide effective treatment alternative to the intravenous route.

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