Clostrium perfringes infection of a Total Knee Arthroplasty Case Report and Review of the Literature

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Citation

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Abstract

C. perfringes is a gram positive anaerobic pathogen that is usually associated with skin and soft tissue infections, gastrointestinal infections and occasionally bacteremia. Arthroplasty infections associated with c. perfringes have been rarely reported with most of them being associated with bacteremia. We present a case of de novo C. perfringes infection in a patient with a total knee arthroplasty (TKA) without associated bacteremia.

CASE REPORT

This is a 56-year-old white male with a history of a (TKA) done 13 years ago who underwent a revision of the knee due to malfunctioning of the arthroplasty. Two weeks following the surgery he developed increasing pain and tenderness over the incision site associated with low-grade fever and chills and subsequently developed an abscess over the incision site.

On admission he had a temperature of 100.1F,blood pressure of 124/78 mm Hg and pulse of 79/mt. The clinical exam was significant only for swelling and tenderness to the knee with an abscess over the incision. The size of the abscess was 2”x3” which contained blood stained fluid.

The patient underwent an incision and debridement of the abscess and cultures grew C. perfringes sensitive to clindamycin (MIC 0.5) but resistant to penicillin. Labs included a white blood cell count of 6.7x 10E/ul, ESR 76 and CRP 7.6. The remaining labs were unremarkable. A complete work up was done to identify the primary source of the infection including colonoscopy; ultrasound of the liver and spleen and blood cultures but no source was identified. He then underwent removal of the arthroplasty. He had to undergo repeated wash outs of the site due to the extent of the infection and was treated with cefepeme (MIC0.25) and oral clindamycin for 4 weeks. Follow up in the office 6 months and 1 year later, revealed normalization of the ESR and CRP and complete healing of the wound.

Figure 1

Table 1: Review of Demographics of Joint and Orthopedic Infections Associated with C. perfringens Infections with and without Bacteriemia.

Author/Year of Publication	Sex/ Age	Site of Prosthesis	Bacteremia	Antibiotics Used	Resection Arthroplasty	Outcome
Rush JH et al/ 1976	Unknown	THA	No	Penicillin	Yes	Cured
Maniloff G et al/ 1987	Unknown	THA	Yes	Penicillin, gentamicin, clindamycin	No	Cured
Wilde AH et al/ 1988	Male/ 64 y.o.	TKA	Yes	Penicillin	Yes	Cured
Stern SH et al/ 1988	Female/ 66 y.o.	TKA	NO	Penicillin	Yes	Cured
Kibbler CC et al/ 1991	Female/ Unknown	THA	Yes	Amoxycillin/ Probenicid	No	Cured
Vogely HCh et al/ 1999	Female/ 52 y.o.	THA	Yes	Amoxycillin/ Clavulanate	Yes	Cured
Pearle AD et al/ 2003	Unknown	TKA	NO	Penicillin	Yes	Cured
Antony N et al/ 2009	Male/ 56 y.o.	TKA	No	Cefepeme/ Clindamycin	Yes	Cured

DISCUSSION

C. perfringes can present as a primary cause of infection in skin and soft tissue infections such as gas gangrene and occasionally sepsis. Usually a primary etiological factor cause can be elucidated in these cases. C.perfringes infections in a case of total hip arthroplasty were first documented in Australia in 1976, in the immediate postoperative period, with an acute wound infection and sepsis syndrome (1). In one of the large series reported on joint infections, anaerobes reportably cause 50% of infected prosthetic joint infections but C. perfringes was not reported. (2,3). In this cases there were 4 patients with spontaneous c perfringes infections and all these patients were cured after removal of the hardware. The treatment was all penicillin based and the cure rates were 100% probably based on removal of hardware and intravenous antibiotics.

This case has several interesting points worth noting.

1. The presence of spontaneous C. perfringes infection of arthroplasty without a primary source is a rare presentation and needs to be looked for in culture negative hardware infections, especially if there was a history of recent trauma. 2. The clinical presentation of C. perfringes infection in hardware infections has not been well defined but seems to present as a skin and soft tissue infections (abscess) in most cases and may occasionally be associated with bacteremia. 3. Previous review of the literature suggests a hematogenous primary source in most cases with secondary seeding of the hardware. (4,5; Table 1). Primary infections of the arthroplasty with this organism probably result from direct seeding into the tissues either from post operative infections or in a host with tissues and blood vessels that have been damaged extensively. 4. There is no data at this time to suggest the optimal approach to C. perfringes associated arthroplasty infections as there is little to no data that supports removal or retention of the hardware; however, from the authors previous experience and from the sparse literature available we would recommend removal of the hardware or at the very least, change of the plastic components and treatment with an appropriate antibiotic.

(6-11). 5 The appropriate antibiotic would depend of the susceptibility reports and the optimal duration should be based on the previous experience in the literature i.e 4 to 6 weeks of intravenous therapy.

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