



Case report

Prevotella osteomyelitis after dental capping procedure

Alexander Williams*, Thomas Kerkerling

Carilion Clinic, Virginia Tech Carilion School of Medicine, USA



ARTICLE INFO

Article history:

Received 29 December 2016

Received in revised form 24 January 2017

Accepted 24 January 2017

ABSTRACT

We present a 49 year old man who presented to the emergency department with severe lower back pain of 5 days duration. One week prior he had been diagnosed with a right psoas muscle abscess and was discharged with a 28 day course of moxifloxacin after the preliminary culture from the psoas grew an anaerobic organism. MRI of the lumbar spine showed marrow edema in the L2 body, occupying most of the anterior two thirds of the body, with cortical erosion at the anteroinferior aspect of L1. Blood cultures were negative and bone biopsy of L2 showed neutrophilic invasion and reactive changes. Cultures grew *Prevotella oralis*. Hematogenous spread from a composite bonding procedure for exposed teeth roots is thought to be the source for the vertebral osteomyelitis. This is a plausible spread of infection in our case because it was thought that the osteomyelitis occurred first and spread to the psoas muscle.

© 2017 Published by Elsevier Ltd. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

Introduction

The annual incidence of pyogenic vertebral osteomyelitis is estimated to range from 0.3–6.5 cases per 100,000 persons [1] and has a high risk for morbidity. It is most often associated with hematogenous spread, direct extension of soft tissue infection and contamination after a spinal procedure. The most common pathogens are *Staphylococcus aureus* or gram negative bacilli. *Prevotella oralis* is a naturally occurring anaerobic bacterium of the oral flora. The incidence of *P. oralis* causing infections is unknown but it has been documented to cause vertebral osteomyelitis. This appears to be the first case of dental composite bonding implicated as the source.

Case presentation

A 49 year old man initially presented to the emergency room with severe lower back pain. He admitted to using anabolic steroids for years, injecting into his thighs and shoulders but otherwise had no medical problems. Three weeks prior he had undergone a composite bonding procedure to cover exposed roots of teeth due to receding gum line. Examination of his oral mucosa revealed a receding gum line, no ulcerations or erythema. Magnetic Resonance Imaging showed a 2.0 cm fluid collection in the right psoas muscle at the L1-L2 level, and marrow edema at L5. C-reactive protein was 14.5 mg/L (normal <1.0 mg/L), erythrocyte

sedimentation rate was 46. There was no leukocytosis or fever. He was thought to potentially have osteomyelitis however biopsy was pursued but rather, he was started empirically on vancomycin, metronidazole and levofloxacin. Fluid aspirated from the abscess grew *P. oralis*, although the organism failed to thrive for sensitivities. Blood cultures were negative and his back pain started to improve. He was discharged on a 28 day course of moxifloxacin 400 mg PO daily. About 1 week after discharge his back pain worsened and he returned to the Emergency Department. Repeat MRI showed marrow edema in the L2 body, occupying most of the anterior two thirds of the body, with cortical erosion and lesser edema that has developed in the interval at the anteroinferior aspect of L1. He remained afebrile with no leukocytosis. His C-reactive protein was 3.87 and the rest of his laboratory studies were unremarkable. Repeat blood cultures were negative. Bone biopsy showed neutrophilic invasion and reactive changes of L2. He was started on ertapenem 1 g IV daily for a total duration of 6 weeks.

Discussion

P. oralis is a gram negative anaerobic bacteria that is differentiated from other *Prevotella* species in that it does not produce a pigment on blood agar. It was previously referred to as *Bacteroides oralis* before being classified into the genus *Prevotella* by Shah and Collins in 1990 [2]. It is a native bacterium of the oral flora in humans. The incidence of anaerobic bacterium causing vertebral osteomyelitis is unknown but is often associated with spinal trauma or surgery [3] and is thought to be increasing, partly due to increased life expectancy, improved diagnosis and use of

* Corresponding author.

E-mail address: ajwilliams1@carilionclinic.org (A. Williams).

immunosuppressive agents [4]. The most common pathogens are Staphylococcal species. Vertebral osteomyelitis from *Prevotella* species has been described in six case reports from 1997 to present with *P. oralis* being described once. The case of *P. oralis* vertebral osteomyelitis was described in a patient with a necrotic submucosal cyst in the esophagus causing sepsis [5]. The use of anabolic steroids may have made him more susceptible to infection [6]. *Prevotella* species are among the dominant microflora isolated from secondary dental caries in composite and amalgam fillings [7]. Fluoroquinolones are often used for gram negative anaerobes but an increase in resistance to moxifloxacin has been documented in *Bacteroides* species and *P. oralis* [8]. It appears the patient had developed at least clinical resistance to moxifloxacin. Due to this failure/clinical resistance to his current regimen and the severity of his infection he was switched to ertapenem. Combining a fluoroquinolones with metronidazole or using a carbapenem is an alternate regimen for gram negative anaerobes that have quinolone resistance [9].

Conclusion

Prevotella species are prevalent among oral flora in humans. Although anti-bacterial prophylaxis is not recommended for dental procedures in patient's undergoing dental capping procedures clinicians should be more aware of the possible connection to these procedures and atypical infections, especially in immunocompromised patients. With rising resistance to fluoroquinolones, clinicians should be aware of clinical failure in patients taking these antimicrobials for anaerobic infections as alternative regimens exist.

Authors contribution

All authors had access to the data and had a role in writing the manuscript. This manuscript has not been submitted or accepted elsewhere. There was no assistance in writing this manuscript.

Funding sources

None.

References

- [1] Jung N, Seifert H, Siewe J, Fatkenheuer G. Spondylodisitis vertebral osteomyelitis. *Der Internist* 2013;54(8):945–53 SpringerLink.
- [2] Shah HN, Collins DM. *Prevotella*, a new genus to include *Bacteroides melaninogenicus* and related species formerly classified in the genus *Bacteroides*. *Int J Syst Bacteriol* 1990;40:205–8.
- [3] Duarte Rui M, Alexander Vaccaro R. "Spinal infection: state of the art and management algorithm." *Eur Spine J* 2013;22(12):2787–99 PMC. Web. 18 Aug. 2016.
- [4] Mahamadou Doutchi, et al. Changing trends in the epidemiology of vertebral osteomyelitis in marseille, France. *New Microb. New Infect.* 2015;7:1–7.
- [5] Goyal Hemant, Shitij Arora, Sneha Mishra, Syed Jamil, Uday Shah. Vertebral osteomyelitis and epidural abscesses caused by *Prevotella oralis*: a case report. *Braz J Infect Dis* 2012;16(6):594–6.
- [6] Mendenhall CL, Grossman CJ, Roselle GA, Hertelendy Z, Ghosn SJ, Lamping K, et al. Anabolic steroid effects on immune function: differences between analogues. *J Steroid Biochem Mol Biol* 1990;37(1):71–6.
- [7] Si-Su Mo, Wei Bao, Guang-Yun Lai, Jun Wang, Ming-Yu Li. The microfloral analysis of secondary caries biofilm around class I and class II composite and amalgam fillings. *BMC Infect Dis* 201710(241).
- [8] Papaparaskevas J, Pantazatou A, Katsandri A, Houhoula DP, Legakis NJ, Tsakris A, et al. Moxifloxacin resistance is prevalent among bacteroides and *Prevotella* species in Greece. *J Antimicrob Chemother* 2008;62(1):137–41.
- [9] Zimmerli W. Vertebral osteomyelitis. *N Engl J Med* 2010;362:1022–9.