Transient bacteraemia due to *Treponema amylovorum* in a Renal Transplant Patient

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**Abstract**

Transient bacteraemia occurs frequently after dental procedures or daily life activities and may be etiologic factors in the development of cardiovascular diseases; the origin is the oral cavity, which is intensively colonized by bacteria. *Treponema amylovorum* is one of these oral bacteria, only isolated in endodontic lesions. We described the first case of a transient bacteraemia due to *T. amylovorum* in an immuno-compromised patient, isolated from the blood through 16S rRNA gene sequencing. This case report highlights the probable underestimation of cases of bacteraemia due to oral *Treponema* species.

**Keywords:** Bacteraemia; Endodontic infection; 16S rRNA; Treponema; T. amylovorum

**Introduction**

Odontogenic bacteraemia is transient and well described; such bacteraemia occurs after dental procedure, but also after daily life activities; it may lead to distant site infections, and is associated with the development of cardiovascular disease [1]. *Streptococci* are the predominant organisms with *Fusobacteria, Actinobacteria* or *Bacteroidetes* [1]. Montagner et al [2] showed that *Treponema* species are implicated in acute endodontic infections, especially *T. amylovorum* isolated in 5/20 patients with infected root canals and 9/20 patients with acute apical abscesses. Siqueira and Rocas [3] investigated occurrence of *T. amylovorum* and found it in 2 of 31 cases (7%; 5% asymptomatic and 10% symptomatic). Currently, there are no data in the literature describing the presence of *Spirochaetes* inhabiting the oral cavity in blood.

Here we report the first case of an immuno-compromised patient who presented a bacteraemia due to *Treponema amylovorum*; then we discuss the interpretation of the presence of such a bacteria in blood.

**Case Report**

The patient is a 30-year-old woman, followed in nephrology for 27 years; her renal history began in 1984 with a typical hemolytic uremic syndrome, leading to hemodialysis since 1987. She underwent three renal transplants (in 1989, 1995 and 2006), resulting in three rejections. The last one occurred in 2006, with graft dysfunction and return in hemodialysis on Canaud’s catheter in August 2010, three times a week. The patient also presents a peripheral arterial disease. Her treatment included prednisone 5 mg per day and tacrolimus 1.5 mg per day, but she stopped by herself these drugs in February 2011.

Since March 8, 2011, she has complained of a left iliac fossa pain in the renal transplant area, with fever (38 °C) without chills. Clinical examination just confirmed the pain, without contracture; the patient did not present any dental pain. One blood culture was sampled on March 10, and she was discharged from the hospital. The blood culture became positive after a 7 day incubation period and microbial diagnosis led to identify *Treponema amylovorum*.

On 15 March, the patient was admitted in the emergency unit for renal transplant’s pain, and she received an antalgic treatment with morphine; the body temperature was 37.9 °C. Biological results showed an elevated C reactive protein (86 mg/L), a leucocytes count at 10.6 G/L with a majority of neutrophils, the presence of an anemia with hemoglobin at 9.2 g/dL, an elevated creatinine at 406 µmol/L, urea at 10.6 mmol/L and an elevated potassium rate at 5.9 mmol/L. Two blood cultures, sampled on 17 and 18 March, remained negative after 5 days of incubation, the urine culture revealed 10°...
Transient bacteraemia, not exceeding 60 minutes after the procedure at risk, are well described after dental treatment procedures, and also after daily life activities such as eating, chewing or tooth brushing in individuals with periodontal inflammation [4]. Odontogenic bacteraemia certainly results from a breach in the oral mucosal barrier allowing the penetration of bacteria into the bloodstream from oral niches; besides, innate microbial factors may play a role, such as virulence factors that mediate tissue penetration and vascular invasion. Lockhart et al [4] inventoried in the literature 126 bacterial species reported in blood cultures following dental extractions or tooth brushing. These bacteraemia were characterized by low concentrations of bacteria in the blood and a rapid clearance of the bacteria by host defenses; those arguments could explain the difficulties to isolate new species or fastidious organisms.

The oral cavity is intensively colonized by bacteria (bacterial plaque from 10^11 and 10^12 CFU/g). More than 700 bacterial species have been isolated in the mouth, and about 20 species are usually cultured on commonly used media. Dental abscess is usually polymicrobial, including facultative or strict anaerobes, and non cultivable bacteria as Treponema, detected with molecular techniques [5]. Oral Treponema species may represent more than 50% of the polymicrobial flora of the dental plaque (70% of species are non cultivable), but less than 1% of the microorganisms in oral cavity of a healthy subject. T. denticola has been associated with periodontitis, with expression of a wide range of virulence factors that mediate tissue penetration, destruction and evasion of host immune responses [6]. T. denticola has also been detected in cardiovascular specimens (cardiac valves, aortic aneurysms), as well as others oral bacteria [7]. For T. amylovorum, few data are available on its pathogenicity, except in periodontal diseases; one study even reported no relationship between the presence of T. amylovorum in dental plaque and associated periodontitis [8].

Direct examination is highly evocative of a Treponema species, cultivation is often difficult, but recent advances in bacterial identification methods, such as 16S rRNA gene sequencing, showed the diversity of bacteria inhabiting the oral cavity [3, 9].

**Discussion**

Transient bacteraemia, not exceeding 60 minutes after the procedure at risk, are well described after dental treatment

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**Figure 1.** Dental panoramic showing periradicular infections on teeth 26-27-36 and 37.
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Conflict of Interest

None.

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References