

## First report of human infection due to *Streptococcus devriesei*

P. Tammaro<sup>1</sup>, N. Richard<sup>2</sup>, B. Andre<sup>2</sup>, A. Andreumont<sup>2,3,4</sup> and H. Mammeri<sup>2,3,4</sup>

1) Service de Chirurgie digestive, 2) Laboratoire de Bactériologie, APHP, Hôpital Bichat Claude Bernard, 3) INSERM, IAME, UMR 1137 and 4) Université Paris Diderot, IAME, UMR 1137, Sorbonne Paris Cité, Paris, France

### Abstract

So far, *Streptococcus devriesei*, which belongs to the *mutans* streptococci group, has been incriminated in the formation of caries in *Equidae*. We report the first human infection due to this species in a 54-year-old man with gangrenous cholecystitis. The patient was treated successfully by cholecystectomy and ceftriaxone.

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**Corresponding author:** H. Mammeri, U1137 IAME, Faculté de médecine Paris Diderot, Paris 7, site Bichat, 16 rue Henri Huchard, 75890 Paris Cedex 18, France  
**E-mail:** [hedi.mammeri@wanadoo.fr](mailto:hedi.mammeri@wanadoo.fr)

A 67-year-old man, who was born in Algeria and had been living in France for 12 years, sought care at the emergency department with abdominal pain in the epigastrium and right hypochondrium. The patient had a medical history of type 2 diabetes treated for 9 years. Diabetes-related complications included arteriopathy of lower limbs and a microalbuminuria. Moreover, the patient experienced dyspnea on mild exertion with preserved cardiac function.

During admission, laboratory findings revealed a white blood cell count of  $20.1 \times 10^9$  cells/L and a C-reactive protein of 160 mg/L. Abdominal computed tomographic scan without contrast medium showed severe cholelithiasis with peritoneal effusion. Intravenous ceftriaxone (1 g daily in one dose) and metronidazole (1.5 g daily in three doses) were immediately initiated and were continued parenterally for 5 days. On day 1, the patient underwent a laparoscopy that revealed a gangrenous gallbladder with areas of necrosis and purulent intraperitoneal discharge. A cholecystectomy was then performed using a median laparotomy procedure. The post-operative course was uneventful. The patient was discharged

at home on day 5. At 3-week follow-up, the patient remained well.

The intragallbladder bile, collected during laparotomy, was immediately analysed. Gram staining revealed numerous leukocytes and Gram-positive cocci in pairs or in short chains. After 1 day of aerobic incubation,  $\alpha$ -haemolytic colonies grew on sheep's blood-supplemented (5%) Columbia agar. Matrix-assisted desorption ionization-time of flight mass spectrometry (MALDI-TOF MS; Shimadzu, Marne la Vallée, France) identified *Streptococcus devriesei* with an accurate identification score to the species level ( $>2$ ). A molecular approach was then performed to further confirm the identification. The 16S rDNA was amplified and sequenced as previously described [1]. BLAST (Basic Local Alignment Search Tool) analysis of the resulting sequence identified the isolate as *S. devriesei* with a maximal identity of 100% for *S. devriesei* type strain CCGU 47156 (GenBank accession number AJ564067). The 16S rRNA gene sequence of our isolate was deposited under accession number KX197202.

Minimum inhibitory concentrations were determined using Etest strips (bioMérieux, Marcy l'Etoile, France). According to Clinical and Laboratory Standards Institute criteria [2], the *S. devriesei* clinical isolate was susceptible to penicillin G (0.03  $\mu$ g/mL), amoxicillin (0.06  $\mu$ g/mL), cefotaxime (0.06  $\mu$ g/mL) and levofloxacin (0.5  $\mu$ g/mL) but resistant to erythromycin (16  $\mu$ g/mL) and clindamycin (8  $\mu$ g/mL).

Phylogenetic analysis based on 16S rRNA gene sequences showed that *S. devriesei* belongs to the *mutans* streptococci group [3,4]. *Streptococcus mutans*, which is the type species of this group, is today considered to play an important role in the development of dental caries in humans [5] and can cause endocarditis in patient at risk [6]. Otherwise, it is considered to be an opportunistic pathogen that rarely causes other invasive infections; it has never been reported as a cause of cholangitis or cholecystitis [7].

*S. devriesei*, which is a transient inhabitant of the oral cavity of horses and ponies [3,4,8], has been shown to be strongly associated with caries in *Equidae* [8]. Our report shows for the first time that *S. devriesei* can also be responsible for human infection.

### Conflict of Interest

None declared.

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