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Case Report
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First Clinical Case of Extensive Necrotizing Fasciitis of the Abdominal Wall and Groin Area with Fatal Outcome Caused by *Eggerthia catenaformis*

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Abstract

The incidence of infections caused by the anaerobic bacterium *Eggerthia catenaformis* and its role as a human pathogen are mostly unknown. We present a case of extensive necrotizing fasciitis of the abdominal wall and groin area with reporting of clinical, surgical and intensive-care treatments.

Introduction

Eggerthia catenaformis is a gram-positive anaerobic non-spore-forming bacterium belonging to the *Erysipelotrichaceae* family [1]. Initially it was isolated from human stools [2]. Recently, its potential as a human pathogen was reported after isolating a strain from saliva of healthy humans [3]. Only 3 clinical cases with human infections caused by *E. catenaformis* have been published to date, a pleural empyema with pulmonary abscess [4], a patient with bacteremia secondary to dental abscess [5] and a brain abscess with an odontogenic focus [6]. We describe a case of necrotizing fasciitis of the abdominal wall and groin area caused by *E. catenaformis*.

Case Presentation

A Multiple morbidities 64-year old female patient with a medical history of diabetes, class III obesity, hypertension and active smoking was brought to the emergency department with hypothermia, somnolence and what was described as "abdominal wounds" by the paramedic. Under further examination, an extensive soft-tissue infection of the whole abdominal wall was discovered, disseminating to the flank, groin and circular upper tight region (Figure 1). The skin was covered in large, foul-smelling necrotic areas with blisters and under palpation of the skin a crackling sound was observed. Three days before, the patient underwent whole body examination during a routine check-up at her gynecologist; no signs of skin-infection were reported. An abdominal Computed Tomography (CT) scan revealed vast areas of subcutaneous entrapped air (Figure 2), corresponding to the medical examination. The patient already presented with signs of encephalopathy and septic shock due to bacteremia (hypothermia, respiratory frequency 28 breaths/min, heart rate 118 beats/min, GCS 11). The leukocyte count was 26.24×10^9 cell/L (reference: $4\text{-}10 \times 10^9$ cell/L), C-reactive Protein 487 mg/dl (reference: <5 mg/dl) and procalcitonin 5.87 ng/ml (reference: < 0.5 ng/ml). Additionally, impaired renal and coagulative functions were already present. For calculated intravenous antibiotic therapy tazobactam/piperacillin, metronidazole and clindamycin were administered immediately after the initial examination. After stabilizing the cardiovascular status, the patient was rushed to the OR within 30 min after admission and radical necrosectomy and fasciectomy of the entire affected area were performed. Microbiological samples of the wound revealed a mixed infection of *E. catenaformis* with *Peptostreptococcus anaerobius*. A pair of anaerobe and a pair of aerobe blood cultures were taken perioperatively after the initial antibiotic agents were administered. Regardless, the blood culture samples tested positive for *Eggerthia bacteremia*. Postoperatively, the patient was treated at the intensive-care unit. Initially, signs of the infection were regressive, and the catecholamine dose could be reduced. However, on the second day after admission the patient's condition worsened and she showed signs of multiple organ dysfunction syndromes with a gradual resistance to vasopressor agents, eventually resulting in a fatal outcome on the third day. Results from in vitro testing of the isolated strain of *E. catenaformis* revealed

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Figure 1: Necrotizing fasciitis of the abdominal wall, groin and upper tight.

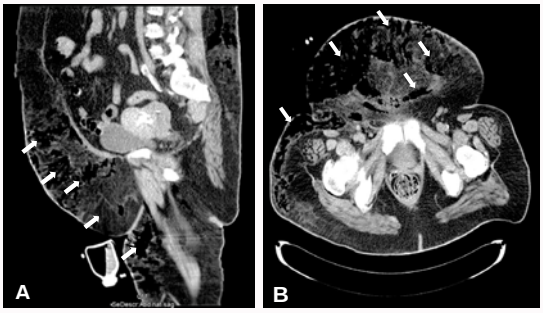

Figure 2: Parenchymal window of an abdominal Computed Tomography (CT) scan shows extensive areas of subcutaneous trapped air (arrows). **A)** Sagittal plane. **B)** Axial plane.

susceptibility for penicillin G, amoxicillin/clavulan, piperacillin/tazobactam, imipenem, vancomycin, metronidazole and an antibiotic resistance for clindamycin and moxifloxacin.

Discussion

E. catenaformis is reported to be a potential human pathogenic organism, but only 3 clinical cases about actual infectious incidents have been published to date. One case presented with a pleural empyema and pulmonary abscess caused by the *E. catenaformis*, another reported a patient with bacteremia due to a dental abscess, the last publication reported a brain abscess. Kordjian hypothesized that hematogenous spread of the bacteria disseminated from dental infection. The same mechanism was suggested in the cases published by Duport and Akashi Information about a potential dental focus in our case could not be obtained. However, the reports indicate that dental infections with *E. catenaformis* as the pathogenic factor could result in serious complication after hematogenous spreading.

Furthermore, as observed for our patient as well as in the case reported by Kordjian necrotizing fasciitis may be a dangerous complication originating from bacterial infection with *E. cantenaformis*. Even though the reported strains seem to be multisensitive to common antibiotic agents, all patients were at serious risk for consequential damages. This must be emphasized especially for multimorbid patients as presented in our case, where the illness showed a fatal progression even though a rapid, radical and thought-out treatment was executed. In summary, the pathogenicity of *E. catenaformis* is mostly unknown. However, in conclusion with other reports, our case indicates that infections with the bacterium might be associated with severe complications. Infections with *E. catenaformis* as the identified pathogenic organism need to be reported and discussed to determine treatment strategies and antibiotic regimens.

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