



## Case report

## *Campylobacter fetus* thyroid gland abscess in a young immunocompetent woman

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## ABSTRACT

*Campylobacter* species are mostly associated with intestinal infections. *Campylobacter fetus*, however, can cause bacteremia and extra-intestinal infections especially in immunosuppressed patients. To the best of our knowledge, we present the second case of *C. fetus* causing thyroiditis and thyroid abscess in an immunocompetent young woman.

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## Introduction

*Campylobacter* is a Greek term derived from two words “campylo” and “baktrom” meaning “curved” and “rod” respectively [1]. *Campylobacteriosis* is the infection by different species of *Campylobacter* bacterium, most commonly *Campylobacter jejuni* and *C. coli* causing around 1.3 million illnesses in the United States each year, mainly intestinal, food borne related diseases [2]. However, infections with less commonly reported species are also observed and *C. fetus* is one of those infrequent species known to cause extra intestinal and systemic campylobacteriosis [3]. In this communication and to the best of our knowledge, we report a case of thyroiditis caused by *C. fetus* in an immunocompetent woman.

## Case presentation

A 36-year-old woman with a history of a mini gastric bypass surgery 5 years before, and an iron deficiency anemia refractory to oral iron supplementation managed by weekly iron sucrose injection presented to our Emergency Department at the American University of Beirut Medical Center. She had a two-day history of worsening anterior neck pain, dyspnea and dysphagia few hours after receiving her iron injection, with subsequent development of chills, fever and anterior neck swelling. On physical examination, the patient was alert and oriented. She was noted to be febrile (38.1 °C) and tachycardic (107 beats/minute). The thyroid gland

was markedly tender on the left side with edema but no regional lymphadenopathy. The rest of the systemic examination was unremarkable. Laboratory tests revealed leukocytosis 16,400 (4,000–11,000/cu.mm); hemoglobin 8.2 (12–18 g/dL); hematocrit 29 (37–54 %); platelets were 437,000 (150,000–400,000 cu.mm); CRP 69 (0–2.5 mg/L). Electrolytes and the thyroid function tests were all within normal limits. A neck CT scan with contrast showed a heterogeneous thyroid gland with a 1.9 cm left thyroid nodule and nonspecific fluid superior and lateral to the left hemi thyroid. Based on these findings, thyroiditis and thyroid abscess were on the differential diagnosis. The patient was admitted to the medical unit and placed on intravenous hydration, analgesics and amoxicillin-clavulanic acid 1.2 gs IVD every eight hours. The next day, an ultrasound of the thyroid gland revealed a large cystic nodule in the left thyroid gland and subcutaneous edema with minimal surrounding free fluid but no well-defined abscess. Percutaneous aspiration of the thyroid cyst under ultrasound guidance revealed a purulent fluid that was sent for culture and histo-pathologic analysis. Histologic examination of the aspirated fluid revealed neutrophils, macrophages, and necrotic debris with no evidence of malignant cells.

Gram stain of the fluid revealed many polymorphonuclear leukocytes, but no organisms. Fluid culture on blood, chocolate and MacConkey agar (Difco) yielded no growth after four days of incubation. Only the fluid inoculated into the thioglycolate broth showed turbidity. Gram stain from the broth revealed small Gram-negative curved rods and was subcultured on MacConkey agar and chocolate agar. After two days of incubation, only chocolate agar grew small transparent colonies. Matrix-Assisted Laser Desorption/Ionization Time of Flight (MALDI-TOF) system (Bruker Daltonik, GmbH, Bremen,

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Germany) identified the organism as *C. fetus* with a score of 2.2 (green flag). For more confirmation, thioglycolate broth that was subcultured on a selective Campylobacter plate (Oxoid) grew after 48 h, under microaerophilic conditions same transparent colonies. Susceptibility testing was performed using disk diffusion on chocolate agar under microaerophilic conditions at 37 °C and 5 % CO<sub>2</sub>. According to Clinical and Laboratory Standards Institute (CLSI) guidelines for interpretation of the inhibitory zone size, *C. fetus* was susceptible to erythromycin (47 mm) and ciprofloxacin (38 mm). The patient was already prescribed amoxicillin-clavulanic acid 1.2 g every eight hours with some clinical improvement, so she was discharged home on the antimicrobial. Follow up ultrasound of the thyroid two weeks later showed significant interval improvement in the left thyroidal/perithyroidal inflammatory changes.

## Discussion

Two subspecies of *C. fetus* have been described. *C. fetus* subsp. *venerealis* known to cause bovine genital campylobacteriosis but is rare in human disease [3], and *C. fetus* subsp. *fetus* (hereafter referred to as *C. fetus*) associated with human diseases in immunocompromised, and elderly patients. The first documented *C. fetus* human infection was reported in 1947 [4]. Subsequently several phenotypic and genetic microbiological studies led to the classification of this strain. *C. fetus* is a gram negative, motile, microaerophilic, spiral shaped, fastidious bacterium that grows between 25 °C and 37 °C [4]. Rarely, *C. fetus* is reported to cause intestinal manifestations, such as diarrheal illnesses, cramps, and periumbilical abdominal pain. Most frequently, it is associated with systemic disease and bacteremia in patients with underlying diseases or immunosuppression (HIV infection, liver disease, lymphoma, and diabetes mellitus). *C. fetus* was reported to cause bacteremia [1] and hematogeneous spread to the central nervous system causing meningitis and meningoencephalitis [5], genital tract causing septic ovarian vein thrombosis [1], perinatal infections, and sometimes abortion. Bone and skeleton are also a nidus resulting in osteomyelitis and spondylodiscitis [6]. Moreover, vascular pathologies were reported, like mycotic aneurysms, pericarditis and prosthetic valve endocarditis [7]. However, only one case reported *C. fetus* infecting a thyroid gland [8], and here, we are discussing the second case of thyroiditis, caused by this pathogen in an immunocompetent previously healthy woman. The exact route of infection in our patient is not clear. Whereas *C. fetus* can contaminate the soil via cattle and sheep feces [4], our patient denied direct contact with animals or ingestion of contaminated food (raw liver, milk, etc.). Moreover, stool cultures were negative and campylobacter prevalence in Lebanon is low [9]. Emesis in the presence of a mini bypass surgery (short gastro-intestinal tract) may be a possible route of entry; transient bacteremia and seeding of the thyroid gland is an alternative route of entry.

The exact pathogenic mechanism of *C. fetus* is still unclear. There is no doubt that such opportunistic organism is evading innate and adaptive immunity [10] in order to reach distant organs. *C. fetus* is reported to have a predilection for vascular sites [1], it is also demonstrated that *C. fetus* has several surface layer proteins (SLP) encoded by the sap genes [11] undergoing continuous DNA recombination, thus escaping the SLP specific antibodies [4]. Noteworthy, mucosa associated lymphoid tissue (MALT) lymphoma outside the stomach, have been associated with chronic bacterial antigenic stimulation of some organisms including *C. jejuni* [12] and possibly *C. fetus*. Our patient will be followed up with repeated thyroid function tests in one month and a neck

ultrasound after 6–12 months. The antimicrobial was not adjusted due to the clinical improvement and the absence of a clear treatment regimen for *C. fetus*.

## Conclusion

*C. fetus* is a fastidious organism not easily recovered in a microbiological laboratory unless the clinician is looking for it. In this case report, the detection of *C. fetus* in a non-stool sample was a great challenge. More challenging is the ambiguous mechanism used by *C. fetus* to evade the immune system, infecting the thyroid gland of an immunocompetent woman causing abscess formation. This rare infection also highlights that further genotyping studies are essential in order to understand *C. fetus* virulence factors and the true prevalence of this bacterium.

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## Ethical approval

Not required.

## Informed consent

Informed consent was obtained from the patient to publish the case.

## Declaration of Competing Interest

None.

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