

Pelvic Peritonitis Caused by *Campylobacter rectus* Infection: Case Report and Literature Review

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Abstract

Campylobacter rectus (CR) is an exclusively oral, Gram-negative anaerobe and mobile bacterium that shows a wide range of virulence factors. A 41-year-old woman came to the emergency department because she felt intense radiating pain in the whole abdomen. A molecular biology analysis rapidly revealed a tubo-ovarian abscess caused by CR. A focal infection of periodontal origin was the most probable; nevertheless the possibility of a cross-contamination from her husband suffering from an active periodontal disease was the subject of discussions. The incidence of focal infections due to CR is probably underestimated. The introduction of molecular biology in common practice should reveal a larger number of CR focal infection cases but more generally speaking of bacteria from the oral cavity.

Keywords: Infection; Extra-oral; *Campylobacter rectus*; *Wolinella recta*; Mass spectrometry

Introduction

Campylobacter rectus (CR) is an exclusively oral, Gram-negative anaerobe and mobile bacterium that shows a wide range of virulence factors, in particular the flagellum, the proteins in the superficial layer, the repeats-in-toxin (RTX) toxins, the GroEL-like proteins and the lipopolysaccharide [1]. CR is involved as direct or indirect pathogen in periodontal diseases. CR can also be found in the necrotic radicular root canals [2]. CR was isolated in cases of appendicitis for patients who suffered from Barrett's esophagus and extra-oral abscesses [3].

We would report the case of a pelvic peritonitis caused by CR whose origin shall be discussed *a posteriori*.

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Case Report

A 41-year-old woman of Caucasian origin came to the emergency department because she had been feeling intense pelvic pain for 10 days that radiated into the whole abdomen accompanied by diarrhea. The medical history is ligation-transection of the Fallopian tubes received 3 months earlier and asthma treated with salbutamol by inhalation.

The clinical examination reveals a fever of 39.5 °C. The abdomen is tense, taut and painful on palpation. The uterus palpation is painful too. The biological analyses confirm the sepsis: leucocytosis (31.4 g/L) with predominant polynuclear neutrophils (85.5%), monocytes (2.36 g/L) and an increased C-reactive protein (414 mg/L).

The pelvic ultrasound shows a complex adnexal mass on the left ovary. A control computed tomography (CT) scan reveals a left tubo-ovarian abscess together with pelvic peritonitis (Fig. 1).

Following her admission to the emergency department the patient underwent surgery with drainage of the tubo-ovarian abscess together with a left partial salpingectomy and then she received a medical treatment with empiric broad-spectrum antibiotics (association of rocephin, metronidazole, doxycycline and gentamicin) administrated intravenously during 48 h. The mass spectrometry of matrix-assisted laser desorption/ionization time-of-flight (MALDI-TOF) identified a CR infection and the patient was administrated a targeted antibiotic treatment of intramuscular rocephin (1 g) during 15 days associated with metronidazole *per os* (1,500 mg) during 21 days.

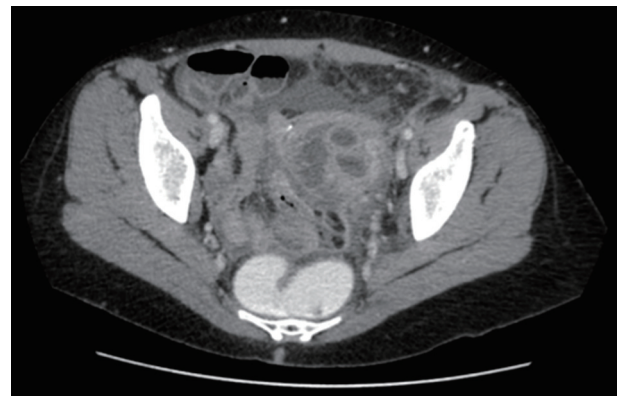


Figure 1. Abdominal CT scan showing a left tubo-ovarian abscess.

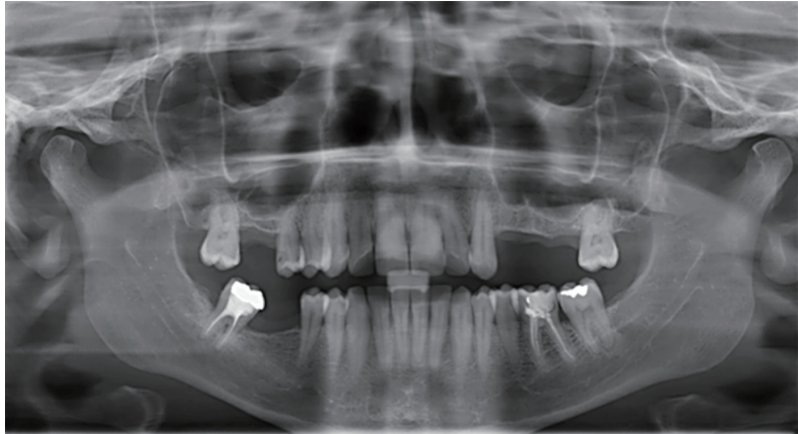


Figure 2. Dental panoramic radiography.

Following recovery the patient was sent for an odontological assessment in order to check her bucco-dental health and to identify *a posteriori* the portal of entry of the pathogen. The clinical examination showed a good bucco-dental condition in spite of a generalized stabilized light periodontal chronic disease. The periodontal probing revealed 3 to 4 mm deep pockets with no associated gingival inflammation or bleeding. The radiological examination (Fig. 2) revealed a thickening of the ligaments on two teeth with no symptomatology of an inflammatory peri-radicular lesion of endodontic origin, characterized by apical pain or radiolucent abscess. A periodontal maintenance was undertaken to control this periodontal disease.

Discussion

As a whole, 15 cases of extra-oral infections with CR were reported in published clinical data, affecting different tissues (Table 1) [4-16]. The patient's recovery mainly depends upon his general health condition, the site affected by the infection but also a quick identification of CR and the provision of a proper and efficient treatment.

The identified risk factors associated with an extra-oral infection with CR are a lack of oral hygiene, a periodontal disease or a dental abscess [4-10]. They can be aggravated by immunosuppression induced by health reasons that could potentiate conditions such as diabetes, chronic alcoholism, a cancerous pathology, a kidney failure or neutropenia [4, 6, 8, 10-12]. Finally, an invasive procedure performed close to a site infected with CR contributes to hematogenous spread. Cases of maxillary and cerebral infections were reported following dental avulsions [9, 13], the case of a breast abscess following nipple piercing [11], and a ligation-transection of the Fallopian tubes followed by a tubo-ovarian abscess in the case we are dealing with. Three cases do not have identified risk factors [14-16].

In this case a focal infection of periodontal origin is the most probable even if we cannot formally prove it. Indeed, the targeted antibiotic treatment significantly reduced the bacterial load of this pathogen and had the bacterial analysis of the periodontal pockets of the host at a distance from the infection

unnecessary.

In this context, we wanted to check the possibility of a cross-contamination from the patient's husband. Indeed, the latter's clinical examination revealed an active periodontal disease with pockets as deep as 5 mm at some sites and with bleeding during associated probing. The bacteria collections into the periodontal pockets were analyzed by mass spectrometry of MALDI-TOF; however the presence of CR was not found.

Even if the hypothesis of a contamination of periodontal origin is the most probable, the concept of a focal infection remains disputable since it is difficult to absolutely prove that an extra-buccal infection has been caused by bacteria from the oral cavity. Animal experimentation and clinical studies put forward several physiopathological mechanisms: bacteremia, intervention of toxins, immunologic mechanisms and/or swallowing of dental plaque [4, 17]. However, it remains difficult to isolate at the same time the same bacteria in the oral cavity and in the infected site with a positive biological analysis.

Conclusions

The incidence of focal infections with CR is probably underestimated because investigations are only conducted occasionally, due to the culture conditions and the cost. The introduction of molecular biology in common practice should reveal a larger number of CR focal infection cases but more generally speaking of bacteria in the oral cavity.

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None to declare.

Table 1. Summary of Reported *Campylobacter rectus* Infections in Data Base

Ref	Year	Sex/age	Health risk factors	Oral exam	Diagnosis	Treatment	Medication	Outcome	Associated organisms	Presumed pathogenesis
[4]	1984	M/62	Chronic alcoholism	Poor oral hygiene, periodontitis, dental abscess	Thoracic wall abscess	Drainage, antibiotics	Penicillin	Recovery	<i>Actinomyces viscosus</i>	Swallowing of dental plaque
[14]	1990	F/62		Good oral hygiene	Brain abscess	Drainage, antibiotics	Penicillin, chloramphenicol relayed by penicillin, clindamycin	Recovery	<i>Streptococcus intermedius</i>	
[5]	1994	M/37	Good health	Poor oral hygiene, periodontitis, dental abscess	Sacroiliitis, septicemia, septic shock	Surgical exploration	Imipenem relayed by penicillin, clindamycin	Recovery	<i>Actinomyces odontolyticus</i>	Periodontitis
[11]	2003	F/32	Lymphoma, neutropenia, nipple piercing		Breast abscess	Drainage, antibiotics	Vancomycin, clindamycin, aztreonam	Recovery	Non-group A beta-hemolytic streptococcus	
[7]	2006	F/41	Good health		Intracranial aneurysm with subdural empyema	Embolization, drainage, antibiotics	Vancomycin, ceftriaxone relayed by metronidazole	Death	<i>Porphyromonas gingivalis</i> , <i>Propionibacterium acnes</i>	
[12]	2006	M/54	Diabetes, hypertension, cholesterol, smoker		Subdural empyema	Drainage, resective surgery, antibiotics	Vancomycin, ceftazidime, metronidazole relayed by ceftriaxone, metronidazole	Recovery	None	Sinusitis and bone defect
[15]	2008	M/24	Chronic otitis, meningoradiculitis		Vertebral abscess	Drainage, antibiotics	Ceftriaxone relayed by clindamycin	Recovery	<i>Actinomyces</i> , <i>Eubacterium brachy</i>	
[6]	2008	M/66	Gastro-esophageal adenocarcinoma, smoker	Poor oral hygiene	Palate abscess	Drainage, antibiotics	Amoxicillin-clavulanate	Recovery	<i>Iridans streptococci</i>	
[7]	2009	M/64	Good health	Poor oral hygiene, gingivitis, dental abscess	Necrotizing soft tissue infection of the right thigh and femoral fracture	Amputation, antibiotics	Amoxicillin-clavulanate, ciprofloxacin	Recovery	<i>Porphyromonas gingivalis</i> , <i>Diphtheroid bacilli</i> , coagulase-negative staphylococci	Periodontitis
[7]	2009	M/56	Good health	Poor oral hygiene, gingivitis, dental abscess	Right thoracic empyema	Drainage, antibiotics	Amoxicillin-clavulanate	Recovery	<i>Streptococcus constellatus</i> , <i>Fusobacterium nucleatum</i>	Periodontitis
[13]	2014	M/55	Dental extraction 12 weeks previously		Septic cavernous sinus thrombosis	Antibiotics	Vancomycin, clindamycin, piperacillin-tazobactam relayed by ertapenem	Recovery	None	
[16]	2016	M/15			Left acute otitis media	Antibiotics	Ampicillin	Recovery	None	
[8]	2017	M/75	Diabetes	Poor oral hygiene, dental plaque	Left thoracic empyema	Drainage, antibiotics	Sulbactam-ampicillin relayed by quinolone	Recovery	None	
[9]	2017	M/66	Dental extraction 10 weeks previously	Periodontitis, dental abscess	Mastoiditis and brain abscess	Drainage, antibiotics	Meropenem relayed by doxycycline	Recovery	None	Dental abscess
[10]	2018	M/69	Kidney failure, atherosclerosis, chronic obstructive pulmonary disease, chronic alcoholism	Poor oral hygiene	Right thoracic empyema and septic shock	Drainage, antibiotics	Amoxicillin-clavulanate, amikacin	Death	<i>Actinomyces meyeri</i>	Periodontitis

Conflict of Interest

None to declare.

Informed Consent

Patient agreed with publication of this case report.

Author Contributions

All the authors revised the manuscript, and approved the final content of the manuscript.

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