

Campylobacter upsaliensis Isolated from a Breast Abscess

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***Campylobacter upsaliensis* is a rare human pathogen recovered so far only from stools or blood from patients with enterocolitis or bacteremia. We report the isolation of *C. upsaliensis* from a breast abscess.**

Campylobacter upsaliensis, also known as catalase-negative or weakly positive thermotolerant *Campylobacter* species (3, 8), was first isolated from the feces of healthy and diarrheic dogs in 1983 (10). Recently, Fox et al. (2) isolated this organism from the feces of three asymptomatic cats.

To our knowledge, human isolates of *C. upsaliensis* obtained only from blood or from stools have been reported in the literature (3-5, 8, 11-13). These strains were from Canada (12, 13), the United States (8), France (5), Belgium (3), South Africa (4), and Australia (11). These bacteria have been isolated from immunocompromised or healthy children and adults suffering from enterocolitis or bacteremia.

In this paper, we report for the first time the isolation of *C. upsaliensis* from a human clinical specimen other than stools or blood.

A 46-year-old woman presented to the Saint-Luc Hospital emergency room in October 1989 because of pain of 2 weeks' duration in her right breast. This patient had no underlying disease and no recent diarrhea, and there was no history of diarrhea in her household. She had no contact with domestic animals, and she worked in a cloth factory. Upon examination, she was afebrile and had an induration (2 by 3 cm) in her right breast. This mass was painful, mobile, and well delimited in the median line, with some redness of overlying skin, and it was accompanied by retraction of the nipple. The mammography showed nodular lesions in the retroareolar region, the biggest being 2 by 1.5 cm in diameter. The overlying skin was thickened by the nipple retraction. It was

suspected that this lesion was neoplastic. Four fine-needle aspirations of the mass were performed during the next 6 weeks, and each cytology examination showed a purulent exudate compatible with an abscess, but no neoplastic cells were seen. Two of the aspirates were cultured; the Gram stain showed numerous polymorphonuclear cells but no bacteria, and the aerobic and anaerobic cultures were negative. The patient was then treated with oral cloxacillin. After 3 months, a biopsy was done under local anesthesia because of the persistence of the mass. The macroscopic examination showed hemorrhagic and encapsulated breast tissue. Steatonecrosis with chronic inflammation and a fibrinoleukocytic exudate of breast parenchyma were found upon histological study. The biopsy tissue was also cultured, and the Gram stain showed no polymorphonuclear cells or bacteria. Upon subculture of chopped-meat broth on an enriched sheep blood agar plate containing 5 µg of gentamicin per ml incubated in an anaerobic chamber for 4 days at 35°C, a *Peptostreptococcus* sp. and a spiral gram-negative rod were isolated. After the surgery, a drain was left in place for a week. Subsequently, the mass disappeared over a period of one month. No stool cultures were performed.

The results of the biochemical tests with the spiral gram-negative rod are reported in Table 1 and are compared with the biochemical reactions of related *Campylobacter* species. These tests were done according to the methods of the Centers for Disease Control, Atlanta, Ga. (6). Our isolate is typical of *C. upsaliensis*; however, these bacteria may have

TABLE 1. Biochemical tests with the *C. upsaliensis* isolate and other related *Campylobacter* species^a

Strain or isolate	Oxidase	Catalase (H ₂ O ₂)	Urease	Nitrate reduction	Hippurate hydrolysis	Susceptibility to:		Growth at 42°C	H ₂ S production on TSI	Growth in:		
						Nalidixic acid	Cephalothin			Glycine (1%)	NaCl (3.5%)	TMAO
<i>C. upsaliensis</i> isolate	+	-	-	+	- ^b	S	S	+	-	+	-	-
<i>C. jejuni</i> subsp. <i>jejuni</i>	+	+	-	+	+	S	R	+	-	+	-	-
<i>C. jejuni</i> subsp. <i>doylei</i>	+	d	-	-	+	S	S	(+) ^c	-	+	-	-
<i>C. coli</i>	+	+	-	+	-	S	R	+	-	+	-	-
<i>C. lari</i>	+	+	(-) ^d	+	-	R	R	+	-	+	-	+
<i>C. fetus</i> subsp. <i>fetus</i>	+	+	-	+	-	R	S	(-)	-	+	-	-
<i>C. hyointestinalis</i>	+	+	-	+	-	R	S	+	+	+	-	+
<i>C. sputorum</i> subsp. <i>sputorum</i>	+	-	-	+	-	R	S	+	+	+	-	d
<i>C. concisus</i>	+	-	-	+	-	R	R	d ^e	+	-	-	-

^a +, 90% or more positive; -, 90% or more negative; S, susceptible; R, resistant; d, variable; TSI, triple sugar iron; TMAO, 0.1% trimethylamine-*N*-oxide.

^b With ninhydrin solution and by gas-liquid chromatography.

^c A low percentage of strains do not have this reaction (9).

^d Urease-positive *C. lari* isolates are susceptible to nalidixic acid.

^e *C. concisus* grew at 42°C in reference 9 but not in reference 6.

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TABLE 2. Characteristics of clinical isolates of *C. upsaliensis*

Characteristic	Value for reference:						
	11	5	8	4	12	13	3
No. of isolates	9	5	12 ^a	17	7	6	99
No. of adults	1	0	8	0	2	0	NA ^b
Age (yr)	NA		25-83		31-38		
Sex (M/F)	NA		5/3		NA		
No. of children	8	5	3	17	5	6	NA
Age (mo)	≤36	≤24	6-14	4-36	6-24	3.5-36	
Sex (M/F)	NA	NA	2/1	9/8	NA	3/3	
Gastroenteritis	8 ^a	5	3	9	7	3	NA
Other clinical manifestations	0	0	8 ^c	8	0	3 ^d	NA
Source of isolate							
Blood	0	0	8	17	0	0	0
Stool	9	5	3	0	7	6	99
Underlying disease	NA	NA	9	17	NA	NA	NA
Epidemiological data	NA	NA	6 ^e	NA	NA	NA	NA
Years of isolation (mo/yr)	NA	NA	80-86	7/85-4/88	87-88	1/86-4/87	7/86-6/89

^a No information for one strain.

^b NA, information not available.

^c Fever and respiratory symptoms (two patients), ruptured ectopic pregnancy (one patient), fever in elderly men with underlying chronic disease (three patients), and fever in immunocompromised patients (two patients).

^d Febrile (one patient) and asymptomatic (two patients) children.

^e Exposure to raw milk (one patient), chicken (three patients), untreated water (two patients), or domestic or farm animals (five patients) for six patients.

a weak catalase activity. The positive nitrate and negative hippurate tests differentiate *C. upsaliensis* from *Campylobacter jejuni* subsp. *doylei* (9). The absence of H₂S production on triple sugar iron agar and susceptibilities to nalidixic acid and cephalothin are features that separate *C. upsaliensis* from *Campylobacter sputorum* subsp. *sputorum* and *Campylobacter concisus* (6, 9). The identification of the isolate to genus and species levels was confirmed by the Laboratoire de Santé Publique du Québec and by the National Reference Service for *Campylobacters*, Division of Enteric Bacteriology, Laboratory Centre for Disease Control, Ottawa, Canada.

Antimicrobial susceptibility testing was done by using the National Committee for Clinical Laboratory Standards dilution agar plate method for anaerobes (7). By this method, the strain was found to be susceptible to penicillin, piperacillin, cefoxitin, clindamycin, metronidazole, and imipenem.

C. upsaliensis has unique phenotypic features (Table 1), and electrophoresis of proteins results in a unique profile (3, 8). About 90% of these bacteria contain plasmids (3). Because of their unusual susceptibilities to many antimicrobial agents (3, 8), a selective medium for their isolation from stools is not available. Filtration methods are the only satisfactory approach for this purpose (3). Table 2 summarizes the clinical and epidemiological characteristics of human *C. upsaliensis* isolated from blood and stools.

There is increasing evidence of a potential pathogenic role for *C. upsaliensis* in healthy and in immunocompromised patients. More studies are needed to determine the clinical spectrum and epidemiological significance of this bacterium. To our knowledge, this is the first report of the isolation of *C. upsaliensis* from a clinical specimen other than stools or blood. The fact that the *Peptostreptococcus* sp., a frequent

isolate from breast abscesses, was found along with *C. upsaliensis* suggests a similar pathogenic mechanism for the latter organism. These bacteria may have originated in the intestinal flora, as speculated by Brook as a source of anaerobic breast infections (1).

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