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Clindamycin-Resistant *Fusobacterium varium* Bacteremia and Decubitus Ulcer Infection

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Bacteremia due to *Fusobacterium* spp. is unusual (<10% of cases of anaerobic bacteremia), and the isolation of *Fusobacterium varium* is especially uncommon. The most probable sources of *Fusobacterium* bacteremia are the respiratory, the gastrointestinal, and the genitourinary tracts. A.-M. Bourgault et al. (Clin. Infect. Dis. 25[Suppl. 2]:181–183) described 40 patients with *Fusobacterium* bacteremia; only 3 had *Fusobacterium varium*, and no one had decubitus scars as the portal of entry. In another published series (S. Henry, A. De Maria, and W. R. McCabe, Am. J. Med. 75:225–231, 1983) of 26 cases, two patients had concomitant pulmonary lesions and decubitus ulcers but there was no identification to the species level mentioned. We report a case of *Fusobacterium varium* bacteremia and infected sacral decubitus ulcer in an elderly patient.

CASE REPORT

An 83-year-old woman was admitted because of fever and chills. She had a history of type II diabetes and hypertension. Three months before, the patient had undergone a total hip replacement. At the time of admission to the hospital she was febrile, with mild dehydration, and she appeared chronically ill with multiple decubitus ulcers (grade IV in the sacral region and grade II in the lower extremities).

Laboratory tests disclosed the following values: hematocrit, 26%; white blood cell count, 22,300 (70% neutrophils); glucose, 131 mg %; Na^+, 122 meq/ml; K^+, 3 meq/ml; Cl^-, 96 meq/ml. Urinalysis indicated 50 leukocytes/field. A chest radiograph was normal.

On the first day, blood (aerobic and anaerobic bottles; Bact Alert), urine, and soft-tissue cultures were performed, and a combination therapy with intravenous (i.v.) ceftriaxone, 1 g three times a day (t.i.d.), and i.v. metronidazole, 0.5 g t.i.d., was empirically administered.

Debridment of the sacral decubitus scar was performed. The patient's fever resolved promptly with this regimen. Blood cultures yielded an anaerobic gram-negative rod that was identified as *Fusobacterium varium* (anaerobic bottle; Bact Alert) in combination with *Bacteroides fragilis* (anaerobic and aerobic bottles; Bact Alert). The specimen obtained from the sacral decubitus ulcer yielded *Fusobacterium varium*, *Bacteroides fragilis*, *Porphyromonas endodontalis*, a non-spore-forming gram-positive rod, *Enterococcus faecalis*, and *Escherichia coli*. Urine culture showed growth of *Escherichia coli* and *Enterococcus faecalis*. The antibiotic regimen was changed to ampicillin-sulbactam (1.5 g/8 h) and ciprofloxacin (200 mg/12 h). New blood culture showed no growth.

Five days later the patient became febrile and severe sepsis developed. Previous cultures were repeated, and the antibiotic treatment was changed to imipenem, vancomycin, and amikacin. Blood cultures, as well as the central venous catheter, were positive for methicillin-resistant *Staphylococcus aureus*.

The patient died on day 34 of admission secondary to multiorgan failure.

Bacteriology. The initial decubitus ulcer specimen and blood were plated directly onto laked-blood brucella agar and phenylethanol agar supplemented with vitamin K_1-hemin and incubated at 35°C in an anaerobic environment. They were also plated on Levine eosin-methylene blue agar and incubated at 35°C in an oxygen atmosphere and on 5% blood agar and

TABLE 1. Characteristics of *Fusobacterium varium*

Test	Result[a]
Vancomycin (5 μg) disk	R
Kanamycin (1,000 μg) disk	S
Colistin (5 μg) disk	S
Brilliant green disk	R
Oxgall disk	R
Fluorescence	Chartreuse
Growth in 20% bile (BBE)	+
Lipase	+
Motility	−
Indole spot test	+
Catalase	−
Esculin hydrolysis	−
Urease	−
Nitrate reduction	−
Gelatin hydrolysis	−
Fermentation of:	
Glucose	+
Fructose	+
Mannose	+
β-Galactosidase	−

[a] R, resistant; S, susceptible; +, positive; −, negative.

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TABLE 2. Antimicrobial susceptibility (Etest)[a]

Drug	MIC (μg/ml)
Ampicillin	1
Ampicillin-sulbactam	1
Cefoxitin	4
Ceftriaxone	≤4
Clindamycin	16
Imipenem	0.75
Metronidazole	0.125
Chloramphenicol	0.125
Ciprofloxacin	1

[a] The isolate was β-lactamase negative.

chocolate agar and incubated at 35°C in air supplemented with 5% CO_2.

Fusobacterium varium grew only in the anaerobic bottle (Bact Alert; Organon Teknika Corporation, Durham, NC). Microscopic examination showed gram-negative long rods. After 2 days of anaerobic incubation, colonies 1 to 2 mm in diameter, nonhemolytic, semitranslucent, umbonate, with erose edges, grew on brucella blood agar (Difco) supplemented with vitamin K and hemin. No growth was observed on other media incubated in carbon dioxide-enriched and oxygen atmospheres. *Fusobacterium varium* was identified according to routine methods with the Rapid ID-32 A panel (Biomérieux SA, Marcy l'Etoile, France) and Rosco (Taastrup, Denmark) diagnostic tablets (9, 10) (Table 1).

The antimicrobial susceptibility was determined by using the Etest method (cefoxitin, clindamycin, imipenem, metronidazole, and chloramphenicol) (AB Biodisc, Solna, Sweden) and by the agar dilution method according to procedures outlined by the CLSI (formerly NCCLS; ceftriaxone, ampicillin-sulbactam, and ciprofloxacin) (Table 2).

The production of β-lactamase was detected with nitrocefin disk test (Difco).

Discussion. Fusobacteria are non-spore-forming gram-negative anaerobic bacilli and are normal commensals of the human oropharynx, gastrointestinal tract, and female genital tract (4). *Fusobacterium* species are considered an important component in mixed anaerobic infections (1, 3–5, 8, 11). *Fusobacterium nucleatum* and *Fusobacterium necrophorum* are the species most frequently isolated from clinical samples. Infection caused by *Fusobacterium varium* is rare. The organism has been isolated mostly from intra-abdominal infections. In one study of fusobacterial infections in children, a total of 243 strains of *Fusobacterium* species were recovered from 226 of 1,399 (16%) specimens. Only five (2%) were *Fusobacterium varium* (3). In a series of 40 patients with *Fusobacterium* bacteremia, while *Fusobacterium nucleatum* was isolated in 16 cases and *F. necrophorum* in 8 cases, *Fusobacterium varium* was isolated in only 3 cases (1). The clinical features of *Fusobacterium varium* bacteremia are shown in Table 3.

Fusobacterium varium was present in a significant number of patients with active ulcerative colitis (12, 13).

Decubitus ulcers in the sacral region are particularly susceptible to fecal contamination, so most of them are infected with mixed aerobic and anaerobic microorganisms, and they commonly have underlying bacteremia (2). As we mention above, *F. varium* is a normal inhabitant of the gastrointestinal tract, so that colonization and infection of decubitus ulcers will occur as a result of fecal soilage. In our patient bacteremia from the decubitus scar was polymicrobial, as previously noted by Bourgault et al. and George et al. when the source of bacteremia due to *Fusobacterium varium* was the gastrointestinal tract (1, 7).

Fusobacterium varium was recovered only from the anaerobic bottle, so it is very important to collect the specimen properly.

Initial management of infected decubitus ulcers normally involves aggressive surgical debridement and broad-spectrum antimicrobial coverage (2). While most strains of *Fusobacterium* species are sensitive to many antibiotics including β-lactams, chloramphenicol, metronidazole, and clindamycin, *Fusobacterium varium* has been reported to be more resistant (6, 7). Although clindamycin has been included in the treatment of fusobacterial bacteremia associated with intra-abdominal infection (7) and although the three isolates from the series published by Bourgault et al. (1) were susceptible, resistance of *Fusobacterium varium* to clindamycin has been reported (6, 7) and was observed in our isolate as well. Our patient was cured with the treatment implemented. A benign course of bacteremia due to *Fusobacterium varium* has been reported (1).

To our knowledge, the development of bacteremia from an infected decubitus ulcer by *Fusobacterium varium* is a manifestation that has not previously been reported.

TABLE 3. *Fusobacterium varium* bacteremia: clinical features

Reference or source	Age (yr)/sex	Underlying condition(s)	Bacteremia from culture[a]	Bacterium(a) isolated	Source of infection	Outcome
1	29/M	Cervical fracture, bronchitis	LRT	*F. varium*	Hospital	Cured
1	77/F	Aspiration pneumonia	LRT	*F. varium*	Community	Cured
1	86/M	Diverticulitis	GI tract	*F. varium, Bacteroides uniformis, K. pneumoniae, Eubacterium lentum, P. aeruginosa*	Community	Cured
Present case	83/F	Type II diabetes hypertension, total hip replacement, decubitus ulcers	Scars	*F. varium*, *Bacteroides fragilis*	Community	Cured

[a] LRT, lower respiratory tract; GI, gastrointestinal.

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