particularly by the transesophageal method which has greater sensitivity than the transthoracic method for diagnosis of endocarditis (94 % versus 44 % according to Shively et al.(8)).

From a therapeutic point of view, *Neisseria elongata* subsp. *nitroreducens* is not uniformly susceptible to penicillin G but is always susceptible to ampicillin. In the case of allergy to penicillin, ceftriaxone is a valuable alternative since allergic cross-reactions between cephalosporins and penicillin are rare. Moreover, when the bacterial pathogen has not been precisely identified, the broad spectrum of ceftriaxone provides better coverage of gram-negative bacilli potentially resistant to ampicillin, especially since beta-lactamase producing strains have been observed with other commensal species of *Neisseria* (9). The course of the disease was always favourable in patients on antibiotic therapy, although valve replacement was required in four of the five cases reported.

Our case emphasizes the risk of infectious endocarditis in patients with mitral valve prolapse associated with murmur and/or thickened valves. Mitral valve prolapse is currently the most frequent valve disease, with an estimated prevalence of 5 % in the general population. However, silent forms, with no murmur or click and no valve thickening visible on echocardiography, are most frequent (80 % of cases). There is, in fact, no or very little risk of infectious endocarditis with these forms and thus no need for special measures of antibiotic prophylaxis, which should be reserved for the forms with murmur and/or thickened valves (10).

References


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**Use of Nonradioactive DNA Probes to Identify a *Campylobacter jejuni* Strain Causing Abortion**

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A case of human abortion due to a *Campylobacter* infection is reported. Cultures revealed two morphologically different isolates with large and small colonies respectively. Using conventional methods of identification, the large colonies were identified as *Campylobacter jejuni* and the small colonies as *Campylobacter coli*. Dot blot hybridization and determination of rDNA restriction fragment patterns revealed that both colony types were the same strain of *Campylobacter jejuni*. This observation illustrates the need to use methods other than phenotypic methods when identifying strains of *Campylobacter*.

*Campylobacter jejuni, Campylobacter coli* and *Campylobacter fetus* subspecies *fetus* are known to cause abortion, premature labour and serious perinatal infections in humans (1). There are few biochemical tests available that differentiate *Campylobacter coli* from *Campylobacter jejuni*. DNA hybridization analysis suggests that the

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most useful biochemical test is hippurate hydrolysis (2): Campylobacter coli strains cannot hydrolyse hippurate, whereas most Campylobacter jejuni strains can. However, hippurate-negative strains of Campylobacter jejuni have been described (3). Due in part to these identification difficulties the exact role of Campylobacter coli in obstetric and perinatal disease remains unclear. We report a case of abortion due to Campylobacter spp. in which use of DNA probes was required to determine the etiology unambiguously.

Case Report. A 26 year-old primigravida with a previously uncomplicated gynaecological history had an uneventful pregnancy until suddenly at 14 weeks of gestation she became febrile (39 °C) and developed abdominal pain. At admission to hospital, she clearly described dysuria, high frequency of urination and uterine contractions. Abdominal examination revealed left flank tenderness. Gynaecological examination showed thick vaginal discharge. An ultrasound scan showed a foetus of size and development consistent with the gestational age but with no cardiac activity.

Vaginal, cervical and urine samples were cultured and blood cultures performed. The patient was treated by parenteral administration of amoxicillin (2 g t.i.d.). Twelve hours later the woman aborted spontaneously. Digital placenta delivery was necessary and a placental sample was taken for bacteriological examination. Embryo examination did not reveal malformation. The temperature and clinical symptoms of the patient improved the next day without further intervention, and the patient was discharged from hospital on the fourth day.

Genital, urine and placenta samples were plated on tryptic soy agar with 5 % horse blood incubated aerobically, on chocolate agar supplemented with Polyvitex incubated in 8–10 % CO₂, and on Colombia agar with 5 % sheep blood incubated anaerobically (bioMérieux, France). Blood cultures were performed using both anaerobic and aerobic media (Bactec NR7A and NR6A, Becton Dickinson, USA) and were scored using the Bactec NR660 (Becton Dickinson).

Cultures of urine samples were negative; cultures of vaginal, cervical and placental samples, and blood cultures were positive after 48 h of incubation. Two morphologically different colony types were observed in growth from these four positive sites. They were identified by conventional methods using accepted criteria: Gram stain, tests for oxidase, nitrate reduction, catalase production, H₂S production, growth in the presence of 1 % glycine and 3.5 % NaCl, growth at 25 °C and 42 °C, susceptibility to nalidixic acid and cephalothin (30 μg/disk), and hippurate hydrolysis (4). Hippurate hydrolysis was tested both by the rapid procedure as described by Harvey (5) and by the slow procedure as recommended by Skirrow and Benjamin (6). The two isolates were identified as Campylobacter. The first type of colony, which was large, flat, watery, translucent and hippurate positive, was identified as Campylobacter jejuni. The second type, which was small, round, convex, smooth, glistening and hippurate negative, was identified as Campylobacter coli. Phenotypic identification was confirmed by the Laboratoire des Idéntifications, Service d’Écologie Bactérienne, Institut Pasteur, Paris. The reproducibility of hippurate hydrolysis results was determined by retesting 30 colonies of each morphological type.

Previous studies have shown that some Campylobacter jejuni strains are negative for hippurate hydrolysis (3). Therefore, to verify the species of the smaller colony type, we used DNA hybridization analysis with acetylaminofluorene (AAF)-labelled genomic DNA probes.

DNA extracts were prepared as described previously (7) and according to Brenner et al. (8). Total genomic DNA from Campylobacter jejuni CIP 702 (Collection Institut Pasteur, Paris, France), Campylobacter coli CIP 7080, Campylobacter laridis NCTC 11352 (National Collection of Type Cultures, London, UK), and Campylobacter upsaliensis NCTC 11541 was extracted and labelled with acetylaminofluorene (AAF) as

![Figure 1: Southern blot hybridization with an AAF-labelled rRNA probe: 2 μg of DNA extracted from colony 1 (1) and colony 2 (2) was digested with following restriction enzymes: PvuII, HindIII, EcoRV, DraI and BglII. Values on the left indicate the length (in base pairs) of some of the fragments of the DNA molecular weight marker "Raoult".](image-url)