**Clostridium sordellii** as a Cause of Constrictive Pericarditis with Pyopericardium and Tamponade

Rama Chaudhry,* Nishant Verma, Tej Bahadur, Parul Chaudhary, Pallavi Sharma, and Nidhi Sharma

*All India Institute of Medical Sciences, New Delhi, India*

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Systemic infections caused by *Clostridium sordellii* are rare. They are usually reported in cases of skin and soft tissue infections and sometimes in cases of toxic shock syndrome involving exotoxins. We report here the first case of *Clostridium sordellii* infection associated with acute constrictive pericarditis and with pyopericardium and tamponade.

**CASE REPORT**

The patient, an 8-month-old infant, was admitted to a local hospital with a history of about 2 months of fever and an abscess in the right thigh that had developed following hepatitis B vaccination. The abscess was drained, and the pus culture revealed *Staphylococcus aureus*, for which the patient was given vancomycin intravenously per the antimicrobial susceptibility report. The abscess subsequently healed; however, the patient remained sick, with development of a dry cough and swelling of legs. Echocardiography and chest X-ray results showed a pericardial effusion with an increased cardiothoracic ratio, and the patient was referred to our institute. On admission, the patient was afebrile, with mild pedal edema, tender hepatomegaly, and liver palpable to 4 cm below the costal margin. Routine investigations showed hemoglobin at 12.8 g/dl; total leukocyte count at 14,100/µl; differential leukocyte counts of neutrophils at 50, lymphocytes at 46, eosinophils at 3, and monocytes at 1; an erythrocyte sedimentation rate at 5 mm in the first hour; blood urea at 35 mg/dl; serum creatinine at 0.4 mg/dl; serum sodium at 128 mEq/liter; serum potassium at 4.3 mEq/liter; serum aspartate transaminase (SGOT) at 115 U/liter; serum glutamic pyruvic transaminase (SGPT) at 115 U/liter; serum glutamic pyruvic transaminase (SGPT) at 115 U/liter; total bilirubin at 1.8 mg/dl; total protein at 5.1 g/dl; and serum albumin at 2.8 g/dl. The urine output was within normal limits. Central nervous system and respiratory system examinations showed no abnormalities. The patient’s heart rate was 128 beats per min. Electrocardiogram showed low-voltage complexes, and echocardiography revealed organized pericardial effusions with features of tamponade. A chest X-ray showed a cardiothoracic ratio of 0.65. A computed tomography (CT) scan of the chest showed features suggestive of diffusely constrictive pericarditis, and a diagnosis of constrictive pericarditis with pyopericardium and tamponade was made. Pigtail drainage of pericardial pus was performed, and the patient was empirically administered intravenous piperacillin-tazobactam and linezolid. On examination, the pericardial fluid was turbid, with protein at 40 mg/dl; sugar at 45 mg/dl; a total leukocyte count of 2,600/µl; and differential leukocyte counts of neutrophils at 90 and lymphocytes at 10. Gram staining on a direct smear showed no organisms, and Ziehl-Neelsen staining showed no acid-fast bacilli. Aerobic cultures of pericardial fluid and blood were sterile; however, pericardial fluid was not sent for anaerobic culture. Meanwhile, the patient had stabilized. A follow-up computerized tomography angiogram showed a localized constriction at the atrioventricular groove, and pericardectomy was performed. The postoperative period was uneventful, and the patient was discharged with an oral amoxicillin-clavulanic acid treatment regimen as prescribed.

The excised pericardial tissue was sent for both aerobic and anaerobic culture. Aerobic culture showed no growth on anaerobic culture, odorless, flat, grayish, nonhemolytic colonies with irregular margins were seen. They were metronidazole sensitive. Gram staining showed Gram-positive bacilli with subterminal nonbulging spores. The isolate was further identified biochemically and tested positive for lecithinase, urease, gelatin liquefaction, indole production, glucose fermentation, and esculin hydrolysis. The isolate was identified as *Clostridium sordellii*. The isolate was also tested using API 20A (bioMérieux, France) and was again identified as *C. sordellii*. A PCR using published primers for the 16S rRNA gene was also done. Briefly, DNA was extracted from the culture by the use of a QiAmp kit (Qiagen, Germany) and was amplified using broad-range PCR primers, i.e., forward primer (F8) 5'-AGTITTGATCCTGGCTCAG-3' and reverse primer (C1SOR-R) 5'-CACCACCTGTCACCAT-TCGAGCGACCTTCGG-3'. Amplified products, i.e., 330 bp (Fig. 1) for broad-range PCR and 944 bp (Fig. 2) for *Clostridium sordellii*-specific PCR, were purified using a Qiagen gel extraction kit. The purified products were commercially sequenced and compared with sequences available in the GenBank database by the use of the Basic Local Alignment Search Tool (BLAST). The 16S rRNA gene sequences amplified from the isolate showed 99% identity with the *C. sordellii* sequence (GenBank accession no. AB448946.1) available in the database. Thus, *C. sordellii*...
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infrequent human pathogen associated with skin and soft
C. sordellii pericarditis.
been reported, to our knowledge, this is the first case in
comparing condition. Brahan et al. (3), François et al. (8), and
Pigrau et al. (12) have reported the association of
C. difficile pericarditis complicating pseudomembranous
colitis in a patient hospitalized after multiple traumas was
first reported by Koehler et al. (11). It is to be noted that
C. difficile resembles C. sordellii phenotypically, and, since C.
difficile strains of greater virulence such as NAP1 are being
reported worldwide, there is a need to carefully differentiate
them genotypically (7). Although a few other cases of peri-
carditis caused by species of the genus Clostridium have
been reported, to our knowledge, this is the first case in
which C. sordellii infection was found to be associated with
pericarditis. C. sordellii is a Gram-positive anaerobe and an
infrequent human pathogen associated with skin and soft
tissue infections. The exotoxins produced by the bacteria are
associated with toxic shock syndrome and with a high mor-
tality rate following childbirth, medically induced abortion,
and routine gynecological procedures (1, 2). Recently, C.
sordellii has been reported as a cause of brain abscess (15).
In the case reported here, there was no initial clinical sus-
picion of anaerobic infection. Since all of the other possible
causes were systematically ruled out, the clinicians finally de-
cided to send the excised pericardial tissue for anaerobic cul-
ture. The sample was transported in anaerobic transport me-
dium with sterility precautions. A pure culture of C. sordellii
was confirmed phenotypically and genotypically.
Different prevailing local conditions and host factors and
rapid administration of appropriate antimicrobial treatment
could have decreased the clinical severity of the infection;
however, the patient whose case is reported here was given a
good prognosis. The possibility of a low level of virulence of
the pathogen as a factor mitigating the severity of the symp-
toms could not be ruled out (5).
The present case demonstrates that C. sordellii can cause
acute constrictive pericarditis. Moreover, the expanding cli-
cal spectrum of C. sordellii infections necessitates application
of rapid identification methods such as PCR and gene sequenc-
ing and increased clinical awareness of this unrecognized hu-
man pathogen.

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REFERENCES
infections: epidemiology, clinical findings, and current perspectives on diag-
The band corresponding to the 944-bp sequence of the 16S rRNA gene is indicated (arrow).
Lane 1, 100-bp ladder; lane 2, negative control; lane 3, C. sordellii pericardial isolate; lanes 4 and 5, C. sordellii
laboratory isolate; lane 6, negative control.
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