First Case Report from Argentina of Fatal Septicemia Caused by 
Chromobacterium violaceum

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A case of Chromobacterium violaceum fatal septicemia is reported. The microorganism was isolated from six 
blood cultures and two suppurated skin lesions. It is the first such case described in Argentina, and it reinforces 
the need for prolonged treatment and careful clinical evaluation to ensure complete remission of human 
infected caused by this bacterium.

Chromobacterium violaceum is a gram-negative, facultatively anaerobic, fermentative, and oxidase-positive rod-
shaped bacterium. It produces a violet nondiffusible pigment 
known as violacein, soluble in ethanol and insoluble in water 
and chloroform. C. violaceum is usually found as a saprophyte of soil and 
water in tropical and subtropical areas. Human infections 
produced by this bacterium are very infrequent. To our 
knowledge, only about 30 cases have been reported (8). 
Their main clinical features were sepsis and multiple liver 
abscesses, and most of them were fatal (1, 2, 4, 6, 7, 9, 12). 

Case report. A 44-year-old woman was admitted to the 
Juan A. Fernandez Hospital in Buenos Aires, Argentina, in 
February 1985. She had a high fever, diffuse abdominal pain, 
right elbow and left ankle inflammation, and purple 
micronodules on the thigh, abdomen, and back, some of 
which were ulcerated. An enlarged liver and jaundice were 
observed.

One month before admission, the patient was in good 
health. She explained that while bathing in the Itacurubi 
lagoon, Paraguay, during a vacation in January 1985, she 
was stung on the foot by a wasp.

Laboratory studies revealed a leukocyte count of 
22,800/mm3 with neutrophilia, hematocrit of 25%, serum 
glutamic oxalacetic transaminase of 80 U, and serum 
glutamic pyruvic transaminase of 40 U. 

Serial blood cultures were made, and samples of suppurated 
skin lesions (Fig. 1) on both feet were taken for culture. 

Empirical treatment with cephalothin (Keflin) at 12 g/day (2 
g every 4 h) and gentamicin at 240 mg/day (80 mg every 8 h) 
was begun.

The condition of the patient worsened quickly, and she 
became markedly confused and disoriented, showing acute 
renal insufficiency, septic liver damage, disseminated intravascular coagulation, and hemodynamic instability which 
required inotropic help. She was put on hemodialysis. An 
adrenal ecography showed normal biliary ducts, liver, 
and spleen.

At this time the bacteriologic report was received, indi-
cating the isolation of C. violaceum in blood cultures and 
two skin samples. In light of the results of a susceptibility 
test and acute renal failure, the therapeutic schedule was 
changed. Mezlocillin was administered at 6 g/day (3 g each 
12 h), with an extra 3-g dose after each dialysis treatment for 
34 days, instead of cephalothin; gentamicin (80 mg) was 
given after each hemodialysis treatment. The patient re-
ceived this aminoglycoside for 30 days. Parenteral nutrition 
with 2,000 cal (8,368 J), 10 g of nitrogen (amino acid), and 
infusion of human albumin was given.

After treatment, the patient’s symptoms disappeared; 
there was no fever, renal function recovered, she accepted 
oral food well, she showed no jaundice, and liver function 
parameters were normalized. Another ecography was done, 
and it was normal. Serial blood cultures were again obtained, 
but no growth of organisms had occurred.

Two weeks after the end of treatment, the patient showed 
fever, confusion, painful tunefaction on the left knee, and 
hemodynamic changes. She died of septic shock 2 days later. 

Blood cultures taken 1 day before her death were positive for 
C. violaceum.

Bacteriologic study. (i) Cultural characteristics. C. 
violaceum was isolated from two specimens of skin pustule 
exudate and from six of nine blood cultures; three of these 
were obtained the day of admission, another three were 
obtained at the end of treatment, and the last three were 
obtained 1 day before the death of the patient. The organism 
showed good growth on the usual plating media, including 
Mueller-Hinton and sheep blood agar. In Trypticase soy 
broth it grew profusely, producing diffuse turbidity and a 
violet ring of growth with a fragile pellicle. The production of 
the typical dark-purple pigment was observed in all culture 
media after overnight incubation. Colonies on blood agar 
were circular, convex, and smooth, about 1 mm in size after 
24 h at 37°C, and they showed beta hemolysis. No growth 
occurred on cetrimide agar.

Plate cultures smelled distinctly of hydrogen cyanide. 
The organism was catalase and oxidize positive. It was difficult 
to interpret the latter because the violet pigment prevented 
observing the result. This difficulty was overcome by incu-
bating the agar plate anaerobically; there was no pigment 
formation. After a few hours under aerobic conditions, the 
colonies became violet again.

(ii) Biochemical features. The biochemical characteristics 
of the isolated strain are shown in Table 1. In triple sugar 
iron agar, C. violaceum developed an alkaline slant and acid 
but without gas or hydrogen sulfide. It grew in Simmons 
citrate agar. The arginine dihydrolase reaction was positive, 
and the lysine and ornithine decarboxylase reactions were 
negative. Amino acid reactions were performed by the 
Moeller technique. The gelatin hydrolysis was performed by the 
quick technique of Frazier (3).

A study of the fermentation of different sugars was done 
with phenol red broth base medium with Andrade’s indica-
of the cases reported have come from tropical and subtropical areas, mainly from Southeast Asia and the southeastern United States. In 1984, Petrillo described the first case in South America, in Brazil (8). Our case is the first in Argentina, although the patient apparently acquired the infection in Paraguay.

Quick diagnosis, accurate bacterial identification, and specific treatment are very important, because *C. violaceum* may cause serious infection in healthy people. There is no clinical evidence that predisposing factors or preexisting disease make the individual more susceptible to infection with this organism (2), although some cases have been described in patients with chronic granulomatous disease, and it was suggested that this might be a predisposing factor (6).

The main features in most of the cases with a fatal outcome seem to be sepsis, multiple liver abscesses, and diffuse pustular dermatitis (13). A case with pulmonary involvement was previously described (5).

The site of entry of the organism is frequently a skin lesion or injury, and days or even months may elapse before systemic disease is manifested. It may also gain entrance via the gastrointestinal tract, and it has been associated with diarrhea. In the present case, there is strong evidence that the site of entry was a skin injury caused by the sting of a wasp.

Although nonpigmented variants of *C. violaceum* have been observed in subcultures, there are no reports of human infections produced by them. Sivendra and Tan, with their animal inoculation experiments, showed that the pathogenicity of the nonpigmented strains is similar to that of the pigmented ones (10). The nonpigmented strains are very

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**TABLE 1. Biochemical characteristics of the isolated strain**

<table>
<thead>
<tr>
<th>Test</th>
<th>Result</th>
</tr>
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<tbody>
<tr>
<td>Hemolysis (clear zone)</td>
<td>+</td>
</tr>
<tr>
<td>Triple sugar iron agar (slant/butt)</td>
<td>Alkaline/acid</td>
</tr>
<tr>
<td>Gas from glucose</td>
<td>-</td>
</tr>
<tr>
<td>Simons citrate</td>
<td>-</td>
</tr>
<tr>
<td>Urease</td>
<td>+</td>
</tr>
<tr>
<td>Motility</td>
<td>+</td>
</tr>
<tr>
<td>Indole</td>
<td>-</td>
</tr>
<tr>
<td>Lysine decarboxylase</td>
<td>-</td>
</tr>
<tr>
<td>Ornithine decarboxylase</td>
<td>-</td>
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<tr>
<td>Arginine dihydrolase</td>
<td>+</td>
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<tr>
<td>Escluin hydrolysis</td>
<td>-</td>
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<tr>
<td>Gelatin hydrolysis</td>
<td>+</td>
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<tr>
<td>DNase</td>
<td>+</td>
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<tr>
<td>Catalase</td>
<td>+</td>
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<tr>
<td>Oxidase</td>
<td>+</td>
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<tr>
<td>Acid from</td>
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<tr>
<td>Glucose</td>
<td>+</td>
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<tr>
<td>Fructose</td>
<td>+</td>
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<tr>
<td>Lactose</td>
<td>-</td>
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<tr>
<td>Maltose</td>
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<tr>
<td>Maltose</td>
<td>-</td>
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<tr>
<td>Manitol</td>
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<td>Xylose</td>
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<tr>
<td>Sucrose</td>
<td>-</td>
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<td>Adonitol</td>
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<td>Inositol</td>
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<tr>
<td>Rhamnose</td>
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<tr>
<td>Salicin</td>
<td>-</td>
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<tr>
<td>Arabinose</td>
<td>-</td>
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<tr>
<td>Trehalose</td>
<td>+</td>
</tr>
<tr>
<td>Sorbitol</td>
<td>-</td>
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<tr>
<td>Erythritol</td>
<td>-</td>
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</table>
difficult to identify, because they are biochemically similar to *Aeromonas hydrophila* and *Pseudomonas* spp.

Our case report reinforces the requirement previously described by other workers that human infections caused by *C. violaceum* be followed for a long time. The clinical and bacteriologic remission in our case proved to be insufficient as a parameter of cure. A more thorough study with computerized axial tomography images would probably have revealed some hidden septic focus.

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**LITERATURE CITED**