

## CASE REPORT

**Fatal Case of *Chromobacterium violaceum* Septicaemia in Goa**Urvi Kamat<sup>1</sup>, Rakhi Ghodse<sup>2</sup><sup>1</sup>Hospicio Hospital, Margao-403601 (Goa) India, <sup>2</sup>Department of Skin & Venereology Dermatology, Goa Medical College, Bambolim-403202 (Goa) India**Abstract:**

*Chromobacterium violaceum* infection can be fatal, if associated with septicemia, hepatic abscess and diffuse pustular dermatitis. *C. violaceum* is a rare, Gram negative, pigment-producing organism found in the tropical and subtropical areas. We present the first case of fatal *C. violaceum* septicemia documented in Goa in September 2014. A 3 year old male presented with fever, hepatomegaly and generalised pustular violet skin lesions following trauma and swelling at left ankle. The causative organism was identified as *C. violaceum* isolated from blood and pus culture and the patient ultimately went into multiorgan failure following septic shock and succumbed to the fatal infection. The major pitfall in the management of this infection can be attributed to rarity of the infection, bizarre clinical presentation, unconventional antibiotic sensitivity pattern, frequent relapse and high mortality rate. Hence high index of suspicion and timely appropriate antimicrobial therapy by the physicians is of paramount importance.

**Keywords:** Skin Pustule, Hepatic Abscess, Violacein, Septic Shock

**Introduction:**

Human infections with *Chromobacterium violaceum*, although rare, can be fatal predominantly in paediatric age group, if associated with septicemia [1]. This Gram negative, facultatively anaerobic, non-fastidious bacillus is a common inhabitant of soil and water found in tropical and subtropical regions [2]. Both pigmented and rare

non pigmented strains have pathogenic potential [2]. The pigment 'violacein' is nondiffusible, soluble in ethanol and insoluble in water and chloroform; however the pathogenicity of *C. violaceum* does not depend on pigment production [2]. Some studies have stated that the pigment has antibacterial, antimycobacterial, antineoplastic properties as well as prevents stomach ulcers [3]. The first documented case of *C. violaceum* in humans was described in Malaysia in 1927 [2]. So far 200 cases have been reported worldwide [4]. And to the best of our knowledge this is the first documented case, in September 2014, from Goa.

**Case Report:**

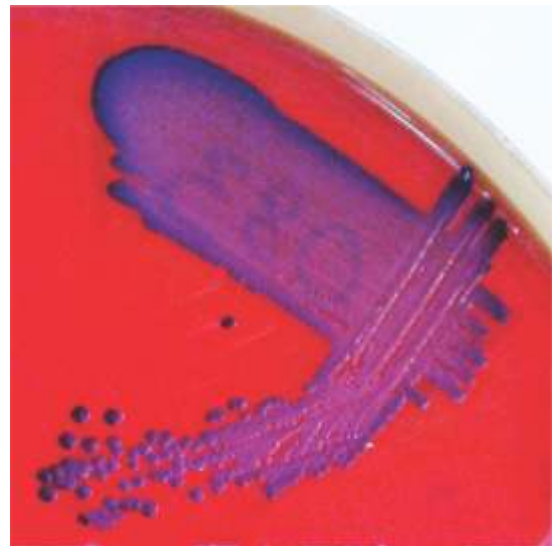
A 3 year old boy was admitted in the paediatric ward with chief complaints of high grade fever (102°F) and multiple purplish skin lesions involving the whole body and face for the previous 2 days. The patient underwent left orchidectomy following torsion testis 4 days ago in a rural hospital in Sawantwadi, and later developed pain and swelling following trauma at left ankle two days post surgery. Incision and drainage was performed and he was started on multiple antibiotics. He was referred to Goa Medical College, in view of septicemia, for further management. Examination findings revealed pulse rate 136/min, respiratory rate 40/min, blood pressure 84/60 mmHg and hepatomegaly. Respiratory system,

central nervous system and cardiovascular system were normal. Laboratory parameters showed haemoglobin 6 g%, total WBC 3900/mm<sup>3</sup> with 67% neutrophils and 21% lymphocytes, SGOT 1677 IU, SGPT 407 IU, ALP 191 IU, blood urea 116 mg/dL, serum creatinine 1.3 mg/dL. Few subcentimetric cysts in left lobe of liver were noted on abdominal ultrasound indicating hepatic abscess. Cerebrospinal Fluid (CSF) findings were normal.

Dermatological examination revealed generalised violet vesicles and pustules with necrotic base and erythematous surrounding skin. On the face, right temporal region, bilateral medial canthii and right ear were involved in the form of bullae on erythematous and indurated base. Neither mucosal involvement nor lymphadenopathy was observed. Gram stain of the pus collected from skin pustules demonstrated Gram negative bacilli and polymorphonuclear leucocytes and the patient was empirically started on IV. Cefoperazone-Sulbactam 150mg/kg/day (825 mg 12 hourly). Pus and blood collected aseptically, were cultured aerobically on MacConkey Agar (MA) and Sheep Blood Agar (SBA). After 24 hours of incubation, 1.0-1.5mm violet pigmented colonies with narrow zone of hemolysis grew on MA and SBA from both the clinical samples (Fig. 1). Organism was catalase and oxidase positive, non-lactose fermenter and motile. Routine biochemical tests demonstrated glucose fermentation with acid production but lactose and mannitol were not fermented nitrates were reduced to nitrites, TSI agar showed alkaline slant and acidic butt without H<sub>2</sub>S production. Urea was not hydrolysed, indole negative and citrate not utilised.

Further identification using VITEK-2 system was done to confirm *C. violaceum*.

Antibiotic susceptibility test showed sensitivity to Imipenem (10 mcg), Chloramphenicol (30 mcg), Piperacillin-Tazobactam (100/10 mcg), Ofloxacin (5 mcg), Ciprofloxacin(5 mcg), Amikacin (30 mcg) and Gentamicin (10 mcg) (Fig. 2). Patient's condition deteriorated despite changing antibiotic therapy to Imipenem and Gentamicin the following day and was shifted to ICU. Total WBC dropped to 1600/mm<sup>3</sup>, liver and renal function tests were alarmingly raised and marked hypotension which led to progressive multiorgan failure, septic shock and eventually death.



**Fig. 1: *Chromobacterium violaceum* on Blood Agar**



**Fig. 2: Antibiotic Sensitivity Pattern of Chromobacterium violaceum**

#### **Discussion:**

Being an emerging pathogen in humans, *C. violaceum* infections are associated with high mortality rate, multidrug resistance and frequent relapse [5]. The infection is acquired when broken skin comes in contact with contaminated soil or water [1]. Transmission is also noted via infected tick bite and fish bite as well as consumption of contaminated seafood [3]. Around 50% cases of *C. violaceum* SSTIs affect limbs and is predominant in males (55.6%) usually between 16-66 years of age [3]. Our patient developed generalised pustular dermatitis following trauma to left ankle which led to disseminated systemic *C. violaceum* infection which can be attributed to cutaneous septic embolisation. The presence of skin lesions often lead to misdiagnosis of disseminated staphylococcal, pseudomonal or varicella infection [6]. Sepsis, multiple liver abscesses, meningitis and pulmonary complications are associated with fatal outcome especially in patients suffering from chronic granulomatous disease, neutrophil dysfunction and G6PD deficiency [2, 6]. Reports of *C. violaceum* sepsis come from India, Nepal,

Indonesia, Bahrain, Congo, Cambodia, Brazil and Vietnam [3]. Due to rarity of *C. violaceum* infection, the optimal antimicrobial therapy is not well established by CLSI guidelines; however *C. violaceum* is resistant to penicillins and cephalosporins [1]. Physicians should be vigilant while managing septic patients with history of exposure to soil or water presenting with generalised skin lesions and hepatic abscess in tropical regions. Mortality of the diseases associated with liver abscess, having either pyogenic or amoebic etiology, has reduced due to advanced imaging techniques, serological tests, guided interventional procedures and prompt treatment, yet are associated with fatal complications [7].

#### **Conclusion:**

High index of suspicion, early diagnosis followed by timely and appropriate antimicrobial therapy is of paramount importance. Integrated approach is required for the effective management of *C. violaceum* infection.

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**How to cite this article:**

Kamat UL, Ghodge RR. Fatal Case of *Chromobacterium violaceum* Septicaemia in Goa. *J Krishna Inst Med Sci Univ* 2021; 10(1):111-114

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■ Submitted: 02-Nov-2020 Accepted: 21-Dec-2020 Published: 01-Jan-2021 ■