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CASE REPORT

A case of *Chromobacterium violaceum*

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ABSTRACT

Infection due to *Chromobacterium violaceum* (*C. violaceum*) is rare in human but it is capable to cause abscesses in vital organs. The diagnosis and management of *Chromobacterium* infection is always challenging due to drugs resistance and relapse nature of the organism, resulting high mortality. We reported a case of 33-year old man, admitted with a history of sharp injury at patellar region of left leg during tree cutting. *C. violaceum* was isolated from post-surgical wound pus. The patient was successfully treated with combination antibiotic therapy. Awareness related *C. violaceum* infection especially in tropical and subtropical regions may be helpful to fruitful outcome. *J Microbiol Infect Dis 2018; 8(2):76-79*

Keywords: *Chromobacterium violaceum*, Case, Wound, Sepsis

INTRODUCTION

Chromobacterium violaceum (*C. violaceum*) is a Gram-negative, rod-shaped, motile, and facultative anaerobic bacterium that gives positive catalase and oxidase reaction [1]. The infection of *C. violaceum* is uncommon in human, but the literature indicates that it may cause life-threatening. It often found in soil and water of tropical and subtropical regions of Southeast Asia, South America and Northeast Australia [2]. The initiation of the disease peculiarly starts with localized skin infection or lymphadenitis due to contact with muddy water.

The infection of the organism is started due to continues skin/infected lymph nodes contact with stagnant water or soil. The sequelae of infection can be turn into fulminating septicemia, with necrotizing metastatic lesions and multiple abscesses in the vital organs, sometime resulting in fatal multi-organ failure [3]. In India, only a few cases of *C. violaceum* infection were reported with various clinical presentations at various locations [2,4-6]. The purpose of present case report was to generate knowledge regarding this rare but fatal organism and their antibiogram for successful management.

CASE

A 33-year-old male was admitted to the emergency ward of Shri Vinoba Bhave Civil Hospital, Silvassa (20.27°N 73.02°E) with a history of injury and sharp cut due to sickle on the patellar region during tree cutting. The patient was conscious, vitals were normal and the palpation a crepitating sound was produced from the patellar region. The radiological examination was carried out and found that fracture of the patella with the tear of patellar tendon and ligament. After cleaning and dressing of wound, the patient was admitted for the surgical procedure for repair of tendon and fixation of the fracture. Routine laboratory investigations were carried out before surgery which showed: hemoglobin, 12.9 g/dl; total white blood cell count of 11,800 cells/mm^3, with 82% polymorphs, 9% Lymphocyte, 5% Eosinophil and 4% Monocyte. Blood indices showed: 5.43 million/cumm red blood cell with 41.4 % PCV and 2.18 lakh/cumm platelet. The serum biochemistry investigation showed; Sodium 141.2 mmol/L, Potassium 3.36 mmol/L, Chloride 10^3.8 mmol/L, BUN 10 mg/dl, creatinine 1.05 mg/dl, total Bilirubin 0.31 mg/dl, AST 37 U/L, ALT 36 U/L and ALP 61 U/L. Surgery was carried out and repair of tear tendon and fixation of the fractured patella was done. Post-surgery patient was treated with analgesic, antacid and antibiotic cefotaxime. On the third day of post-surgery wound was discharging pus. The pus sample was received to the laboratory for routine microbiological examination and antibiotic sensitivity test. Gram stain of the

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discharge from the wound showed gram-negative pleomorphic rods along with plenty of pus cells. The sample was inoculated on nutrient agar, blood agar, MacConkey agar and incubated aerobically at 37 ^{0}C for 24 hours. On next day round, smooth, convex, butyrous, violet-colored colonies were noticed on all the three plates. On blood agar, deep violet colonies with beta-hemolysis were seen. The isolated organism was a facultative anaerobic, motile, gram-negative rod. It was catalase and oxidase positive. Biochemically, indole, methyl red, and Voges-Proskauer test were negative. The organism fermented glucose (producing acid but no gas) and trehalose but did not ferment lactose or mannitol. Triple sugar iron medium showed an alkaline slant and acid but (K/A) without gas and H_2S production. Citrate was utilized and nitrate was reduced. Arginine was decarboxylated but not lysine and ornithine. From above test, the isolate was identified as *C. violaceum*. Subsequently, the isolate was confirmed with Vitek-2 system (Table 1). Antibiotic susceptibility of the organism was tested by the disc diffusion method (Figure 1).

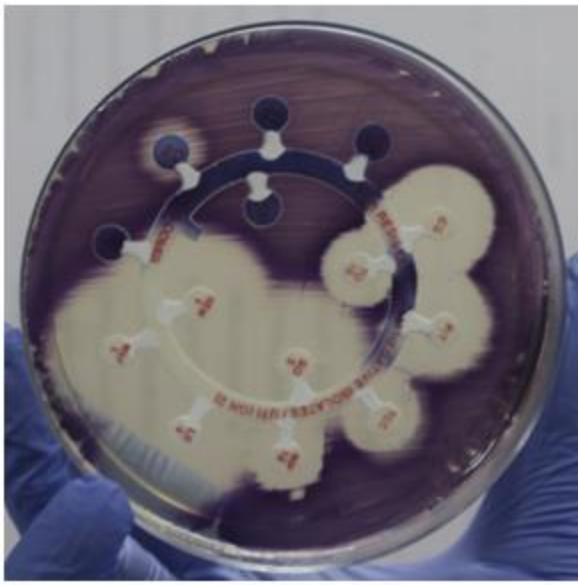

Figure 1. Showing antibiotic susceptibility test.

The results of Antibiotic susceptibility test by the disc diffusion method were documented in Table 2. As CLSI doesn't give breakpoint of minimum inhibitory concentration for *C. violaceum* our VITEK 2 system was unable to give Antibiotic susceptibility hence we tried with breakpoint of E. coli the result was consistent with the disc diffusion method and documented in Table 3.

Table 1. Showing the profile of Biochemical reactions of *C. Violaceum* by Vitek-2.

Test	Result
Ala-Phe-Pro-Arylamidase	-
Adonitol	-
L-Pyrrolydonyl-Arylamidase	+
L-Arabitol	-
D-Cellobiose	-
Beta-Galactosidase	-
H_2S Production	-
Beta-N-Acetyl-Glucosaminidase	+
Glutamyl ArylamidasepNA	+
D-Glucose	+
Gamma-Glutamyl-Transferase	+
Fermentation/Glucose	+
Beta-Glucosidase	-
D-Maltose	-
D-Mannitol	-
D-Manninose	-
Beta-Xylosidase	-
Beta-Alanine arylamidasepNA	-
L-Proline Arylamidase	-
Lipase	-
Palatinose	-
Tyrosine Arylamidase	+
Urease	-
D-Sorbitol	-
Saccharose/Sucrose	-
D-Tagatose	-
D-Trehalos	+
Citrate (Sodium)	-
Malonate	-
5-Keto-D-Gluconate	-
L-Lactate alkalinization	+
Alpha-Glucosidase	-
Succinate alkalinization	+
Beta-N-Acetyl-Galactosaminidase	-
Alpha-Galactosidase	-
Phosphatase	+
Glycine Arylamidase	+
Ornithine Decarboxylase	-
Lysine Decarboxylase	-
L-Histidine assimilation	-
Coumarate	+
Beta-Glucurodinase	-
O/129 Resistance (comp. vibrio)	+
Glu-Gly-Arg-Arylamidase	-
L-Malate assimilation	-
Ellman	-
L-Lactate	-

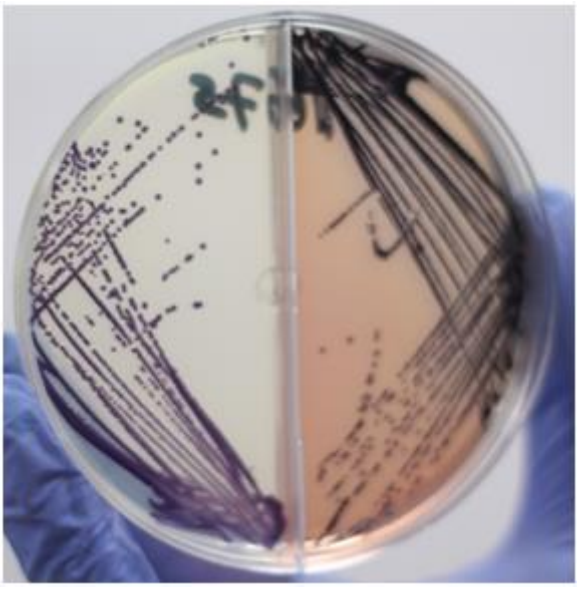

Figure 2. Showing growth of *C. violaceum* on nutrient agar and MacConkey's agar.

The patient was treated with cefoperazone /sulbactam for five days. The patient showed improvement with the healing of wound and disappearance of pus discharge.

Table 2. Antibiotic sensitivity and resistant pattern of *Chromobacterium violaceum* by disc diffusion method.

Antibiotic	Result	Antibiotic	Result
Norfloxacin	S	Cefotaxime	R
Aztreonam	S	Ceftriaxone	R
Nalidixic acid	S	Cefuroxime	R
Nitrofurantoin	S	Ceftazidime	R
Gentamycin	S	Cefixime	R
Amikacin	S	Cefdinir	R
Ciprofloxacin	S	TIC/CLA	R
Ofloxacin	S	Meropenem	R
Levofloxacin	S	Cefprozil	R
Moxifloxacin	S	Cefpirome	R
CEF/SUL	S	Ceftizoxime	R
PIP/TAZ	S	Cefpodoxime	R
Sparfloxacin	S	IMP-CLS	R
Gemifloxacin	S	Tobramycin	R

S=Sensitive, R=Resistant, CEF/SUL=Cefoperazone/ sulbactam, PIP/TAZ=Piperacillin/tazobactam, TIC/CLA, Ticarcillin-clavulanic acid, IMP-CLS=Imipenem -cilastatin

Table 3. Showing antibiotic sensitivity and resistant pattern of *Chromobacterium violaceum* by VITEK-2 (MIC breakup point of *E. coli*).

Antibiotic	MIC	Result	Antibiotic	MIC	Result
Ampicillin	≥32	Resistant	Meropenem	≥16	Resistant
Amoxicillin/clavulanic acid	≥32	Resistant	Amikacin	8	Sensitive
Piperacillin/Tazobactam	≥128	Resistant	Gentamycin	2	Sensitive
Cefuroxime	≥64	Resistant	Nalidixic acid	4*	Sensitive
Cefuroxime Axetil	≥64	Resistant	Ciprofloxacin	0.5	Sensitive
Ceftriaxone	≥64	Resistant	Tigecycline	≤0.5	Sensitive
Cefoperazone/Sulbactam	≥64	Resistant	Nitrofurantoin	≤16	Sensitive
Cefepime	16	Resistant	Colistin	≥16	Resistant
Ertapenem	≥8	Resistant	Trimethoprim / Sulfamethoxazole	≥320	Resistant
Imipenem	4	Resistant			

DISCUSSION

The Human infections caused by *C. violaceum* are uncommon and hardly ever suspected on clinical grounds. The usual initial manifestations could be nonspecific and include fever, cough, otitis, cellulitis, and adenitis or it could present with bacteremia, osteomyelitis, and multiple organ abscesses predominantly in the lungs, liver, and spleen [7]. Bacteremia or disseminated *C. violaceum* infections are associated with poor prognosis can make out from the fatal outcome. The literature indicates that the infection of *C. violaceum* is starts with the subsequently contact of skin with stagnant water or soil then progresses to fulminating septicemia, with necrotizing metastatic lesions and multiple abscesses in vital organs [8 and 9].

In the present case, the patient has got the infection through similar route but the infection was restricted locally due to early diagnosis and continues monitoring of antimicrobials.

The previous studies reported that the organism is susceptible to fluoroquinolones, trimethoprim/sulfamethoxazole carbapenems, aminoglycosides, chloramphenicol or tetracyclines, but resistant to penicillin and cephalosporins [2,6] but the result of present investigation indicates that the isolate was resistant to carbapenems and cephalosporin. The data of the previous investigation suggest improved survival rates when combination antimicrobial therapy is used [10]. The present report confirms the result of previous investigators. Because of its rarity, the initial isolation of *C. violaceum* is frequently considered a saprophytic contaminant. A high index of suspicion and appropriate antimicrobial therapy are necessary to treat this potentially fatal infection.

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