

Rashless and Bilateral Symmetrical Lower Limb Gangrene in a Patient with Meningococcal Meningitis

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Abstract

Introduction: An atypical presentation of meningococcal meningitis in a 10-year-old boy with rashless and bilateral symmetrical lower limb gangrene reported to stress the unusual pattern of the presentation. Unusual presentation of meningococcal meningitis is scarce in the literature, and we are not aware of any unusual presentation in our setting.

Case Report: A 10-year-old boy presented with bilateral lower limb gangrene following a week history of high-grade fever, chills, rigors, neck pain and stiffness, convulsions, headache, altered sensorium, anorexia, and vomiting with no associated history of skin rash. Examination revealed an acutely ill-looking boy that was febrile, pale, anicteric, cyanosed, and not dehydrated. The pulse rate was 120/min, blood pressure 90/50 mmHg, a respiratory rate of 26 cycles/min, and symmetrical bilateral lower limb dry gangrene up to mid-legs with multiple patchy areas of skin necrosis/dermatitis (with eschars) up to mid-thigh noted with Glasgow coma scale of 12 (E3V4M5) and positive signs of meningeal irritations. The complete blood counts, erythrocyte sedimentation rate, random blood sugar, and creatinine were deranged while cerebrospinal fluid from lumbar puncture showed features of bacterial meningitis. The diagnosis of meningococcal meningitis with bilateral dry gangrene of both feet and leg was made and was managed with fluid and blood resuscitation, intravenous antibiotics, bilateral above knee amputation, and other supportive care. The treatment and recovery were satisfactory.

Conclusion: Meningococcal meningitis may present in an atypical manner which may pose a diagnostic dilemma and delayed appropriate treatment.

Keywords: Rashless, Symmetrical lower limb gangrene, Meningococcal meningitis.

Introduction

Neisseria meningitidis cause Meningococcal Meningitis, which is a known cause of life-threatening disease as a result of infection and inflammation of the meninges. The other aetiological organisms that cause acute bacterial meningitis are *Streptococcus pneumoniae* and *Haemophilus influenzae* type B [1-2]. Meningitis from *Neisseria meningitidis* causes severe morbidity and even mortality in worldwide either as an epidemic or sporadic occurrence [1]. An unusual presentation of meningococcal meningitis was noticed in our setting by a 10-year-old boy. He had no rash and later developed bilateral symmetrical lower limb gangrene which is an atypical way of presentation in meningococcal meningitis. This mode of presentation is scarce in the literature reviews and we are unaware of any unusual presentation like this in our setting. This unfamiliar way of presentation poses management challenges for the health care givers as it may lead to delayed and/or missed diagnosis with a negative impact on the outcome that may be informed by morbidity or even mortality.

Case Report

A 10-year-old boy was referred to the orthopaedic and trauma department of a tertiary hospital in northwest, Nigeria, on account of

bilateral lower limb gangrene. A week before presentation, he had a history of high-grade fever, chills, rigors, neck pain and stiffness, convulsions, headache, altered sensorium, anorexia, and vomiting. 2 days after the initial symptoms, he was noticed to have bilateral leg and foot swelling with progressive darkening of the skin. There was no associated history of skin rash. There was no history suggestive of diabetes, sickle cell disease, trauma, vasculitis, drug intake/injections or abuse, heart disease, exposure to extreme coldness, burns injury, tourniquet effect of any materials and previous similar illness. Findings on examination at presentation were that of a patient who was acutely ill-looking, febrile (temperature 38.5°C) was pale, anicteric, cyanosed, and not dehydrated. The vital signs showed a pulse rate of 120/min, blood pressure 90/50 mmHg, and respiratory rate of 26 cycles/min. Musculoskeletal examination showed symmetrical bilateral lower limb dry gangrene up to mid-legs with multiple patchy areas of skin necrosis/dermatitis (with eschars) up to mid-thigh noted. The distal two-thirds of the limbs and foot were insensate and cold. Proximally femoral artery pulse was palpable while distally popliteal, posterior tibial, and dorsalis pedis pulses were not palpable. Central nervous system examination showed a drowsy boy with Glasgow coma scale of 12 (E3V4M5); positive signs of

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Figure 1: Pre-operative clinical photograph showing the symmetrical bilateral foot and leg gangrene with multiple patchy skin necrosis and eschar.



Figure 2: 2-week post-operative clinical photographs of both healing stumps.

meningeal irritations and pupils were equal and reactive to light. Examinations findings of the other system were essentially normal. Laboratory investigation results were complete blood counts (white blood count of 13600/mm³ and hemoglobin concentration of 7.9 g/dL), erythrocyte sedimentation rate by Westergren method was 21 mm/h, serum Na⁺ 135 mEq/L, serum K⁺ 4.1 mEq/L, creatinine 1.3 mg/dL, random blood sugar 119 mg/dL, serology screening for HIV (I and II), hepatitis A, B and C were all negative, blood culture yielded meningococci. Cerebrospinal fluid (CSF) from lumbar puncture showed features of bacterial meningitis (leukocytosis, protein 51 mg/dL, and sugar 14 mg/dL) but negative CSF culture. Doppler ultrasounds of both lower limbs showed absence blood flow distal to mid-femoral arteries bilaterally. Abdominopelvic ultrasonography and chest radiographs revealed normal findings. From the clinical symptoms and signs as well as results of the investigations, a diagnosis of meningococcal meningitis with bilateral dry gangrene of both feet and leg (Fig. 1) was made, and the patient was managed as such with fluid and blood resuscitation, intravenous Ceftriaxone 1 g 12 hourly for 2 weeks, and other supportive care. He was stabilized and counseled for surgery, informed consent was obtained, and he had bilateral below knee amputation with escharectomy and debridement of multiple areas of skin necrosis and eschars (2 weeks from the time of symptoms) (Fig. 2). He responded satisfactorily to the treatment, commenced early phase of rehabilitation, and was discharged home on the 18th day after operation. He has had few outpatient clinic follow-up with satisfactory conditions.

Discussion

Bacterial meningitis is a life-threatening disease that results from bacterial infection of the meninges. The three most common implicated etiological organisms that cause acute bacterial meningitis are *Streptococcus pneumoniae*, *Neisseria meningitidis*, and *Haemophilus influenzae* Type B [1, 2]. *N. meningitidis* causes significant morbidity and mortality in children and young adults worldwide through epidemic or sporadic meningitis and/or septicaemia [1]. *N. meningitidis* is a fastidious, encapsulated, aerobic Gram-negative diplococcus heterotrophic bacterium with 13

identified serotypes (A to L); however, five serotypes (A, B, C, Y, and W-135) are implicated in etiology of major infections [1]. *N. meningitidis* colonizes mucosal surfaces using a multifactorial process involving pili, twitching motility, opacity associated, and other surface proteins [1]. Although the advent of new vaccines is greatly promising, meningococcal infection continues to be public health challenge in both developed and developing nations, due to inadequate universal vaccine coverage and presence of antibiotic resistance strains [1, 3]. Incidence varies from region to region, and with seasons, with Nigerian's attack rates up to 673 cases per 1,00,000 population in the affected regions [4]. The risk factors include respiratory tract infection, otitis media, mastoiditis, trauma to the head, hemoglobinopathy, and immune deficiency states. The bacteria get to the subarachnoid space through a hematogenous route or directly from parameningeal focus of infection. This leads to an intense host inflammatory response which is triggered by lipoteichoic acid and other bacterial cell wall products. This further causes the release of pro-inflammatory mediators, brain edema, increased intracranial pressure, and its varied consequences depending on the severity and treatment [1]. Usually, meningococcal infection leads to septicemia and/or meningitis with rashes as the most common association. Other forms of presentation of the infection are septic arthritis, osteomyelitis, Pneumonia, purulent pericarditis, peritonitis, urethritis, endophthalmitis, and conjunctivitis [1, 3]. The clinical presentation of meningococcal meningitis usually includes rashes, fever, headache, meningeal signs, anorexia, nausea, pallor, convulsions, vomiting, and altered sensorium [1, 3]. These rashes result from the vascular occlusions by antigen-antibody interaction in the skin dermis, but rashes may be absent during early phase of illness or in overwhelming sepsis. The vascular occlusion may lead to endothelial injury with platelet-release reactions, local vasoconstriction, and platelet plugs formation which leads to intravascular thrombosis. Severe microvasculature thrombosis of the skin may lead to glove and stocking necrosis and gangrene of digits or limbs [1, 3]. Symmetrical peripheral gangrene is a rare clinical syndrome with sudden onset of symmetrical distal ischemic changes, leading to gangrene of two or more sites in the absence of large vessel obstruction or vasculitis [5]. Rashless and bilateral leg and foot

gangrene is an atypical presentation found in our patients which is very rare in literature. Review of literature showed few case reports of atypical meningococcal meningitis presentation. In 2014, Hussain and Rupsi reported a case of a 67-year-old man with meningococcal meningitis with symmetrical bilateral toe gangrene [6]. Another atypical presentation reported by Jitendra et al. was a case of a 40-year-old man with bilateral hand and foot gangrene with meningococcal meningitis [7]. Kapoor et al. in 2012 also reported an atypical meningococcal meningitis with rashless presentation in a 40-year-old man. In our case, there were two atypical features: Rashless and bilateral extensive leg and foot gangrene which we found

worthwhile to share our experience.

Conclusion

This case report aims at highlighting the rarity of atypical presentation of meningococcal meningitis which may pose a diagnostic dilemma and delayed appropriate treatment and eventually may affect good treatment outcome.

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