**Case Report**

**Purpura Fulminans Associated with Hemiparesis Following Measles Infection in a Nigerian Girl: A Case Report**

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**Abstract**

Purpura fulminans is a life-threatening hematologic emergency characterized by extensive skin necrosis with hemorrhagic infarction, hypotension and gangrene which may arise from severe sepsis; mostly gram negative sepsis though also associated with some gram positive organisms, similarly viral infections like varicella and measles have been implicated; it may also arise from congenital deficiency of the anticoagulants protein C, S, and antithrombin III; and it may also be idiopathic. Its clinical manifestation may be quite extensive resulting in multiorgan failure. Treatment will require aggressive management with use of fresh frozen plasma, heparin, antibiotics, and surgical debridement of necrotic tissue.

**Keywords:** Hemiparesis, honey dressing, measles, purpura fulminans

**Introduction**

Purpura fulminans was first described by Guelliot in 1884 ever since several cases have been reported. Purpura means bleeding into the skin or mucous membrane; it is classified into petechiae (less 2 mm) and ecchymoses based on the size of the lesion. Purpura may be palpable or nonpalpable and do not blanch to pressure. However, purpura fulminans is a life-threatening hematologic emergency characterized by hemorrhagic infarction of the skin and/or multiple organs with extensive tissue necrosis which may result in gangrene, disseminated intravascular coagulopathy, hypotension and multiple organ failure.

Acute infectious purpura fulminans may complicate sepsis associated with meningococccemia, Streptococcus pneumoniae, Klebsiella pneumoniae, and viral infection like varicella; however its association with measles though previously reported still remains a rare event. Therefore, a case of a 3-year-old girl who had measles with subsequent purpura fulminans and an associated hemiparesis of the right upper and lower limbs is reported.

**Case Report**

A 3-year-old girl presented with darkened and swollen right lower limb and in ability to utilize the right side of the body following febrile illness with associated generalized body rash which started from the face and progressed to the whole body; this was preceded with complaint of coryza; she also had bilateral reddish eye discharge; this occurred during the 2013 period of measles outbreak in her community and she was not immunized for measles. A week after skin desquamation the mother noticed darkened and swollen right foot which was painful, progressive, and by 24 h it had involved up to the ankle; the toes then became blackened [Figure 1]. The patient had several episodes of generalized tonic-clonic seizures. At about same time after seizure control, mother noticed she could not use the right upper and lower limbs [Figure 2]. She was transferred to our hospital after initial management in a general hospital. On examination, she was not febrile; the cardiac and respiratory examinations were not remarkable. All peripheral pulses were palpable except for the right posterior tibial and dorsalis pedis arteries. At that point, she had regained consciousness, the right upper and lower limbs had reduced power (estimated power were 3/5 in both limbs); the left limbs were normal, there were increased tone in both right upper and lower limbs; and the right foot had areas of darkened and shrunken toes which were not tender with proximal areas of tender swollen purpuric skin. She had deranged clotting profile, that is, activated partial thromboplastin time (aPTT) of 90 s (aPTT = 60-85 s) and prothrombin time (PT) of 28 s (PT = 11-15 s) and thrombocytopenia of 90,000/mm$^3$ (150,000-400,000/mm$^3$) results from referring hospital; but

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the repeat in our hospital were normal, and there was no site of active bleeding. Magnetic resonance imaging (MRI) of the brain was normal [Figure 3], similarly the echocardiograph was normal but the vascular Doppler study confirmed reduced flow in the right posterior tibial artery. Neither fresh frozen plasma infusion nor platelets transfusion was given at the referring hospital. The diagnosis was measles encephalitis with purpura fulminans. She was billed for transtibial amputation of the right lower limbs, but parents declined amputation despite adequate counseling that the grandparents refused amputation. She had honey dressing of the affected limb for 2-weeks with some good effect [Figure 4] before they opted to leave against medical advice.

**Discussion**

Purpura fulminans occurs following an imbalance in the procoagulants and anticoagulants resulting in heightened risk of vascular thrombosis and bleeding. It has been classified into neonatal purpura fulminans, which is due to homozygous deficiencies of protein C; acute infectious purpura fulminans, which could be due to deficiencies of protein S, antithrombin III, and in heterozygous deficiency of protein C; and idiopathic purpura fulminans, which is due to autoantibodies against protein S.\[9,10\] Acute infectious purpura fulminans involves extensive vascular injury from endotoxins, exotoxins, resulting in microthrombi formation with bleeding due to consumption coagulopathy; the extent of damage may be enormous affecting the skin, the lungs, kidneys and brain resulting in multiorgan failure; which explains the gangrene and hemiparesis noticed in this case. Usually the limbs especially the lower limbs are mostly affected in a symmetrical distribution in infectious purpura fulminans, but this case had a single limb involvement which coincided with the same side of hemiparesis; why this is so is not clear. Hemiplegia is a documented complication of some viral infections such as herpes zoster ophthalmicus and varicella; this usually occur weeks following the infection as a result of vasculitis; whether the same mechanism is operational in measles is not clear.

Measles as an etiologic agent in purpura fulminans is poorly documented; therefore this could pose a diagnostic challenge because body rash, fever, and coryza may also be associated with bacterial sepsis like meningococcemia. Diagnosis of measles is...
usually clinical; the rash in this case was typical of measles in its distribution and the blood culture was negative; furthermore this occurred during the outbreak of measles in Kano which was way before known period of *Neisseria meningitidis* outbreaks. Furthermore, the gangrene and hemiparesis occurred after the resolution of fever; which is not the typical picture in septicemic illness.

Treatment of acute infectious purpura fulminans involves: Replacing the deficient hemostatic factors which restores the balance between the procoagulants and the anticoagulant factors; identifying and treating the cause. Therefore fresh frozen plasma corrects deficient clotting factors and use of heparin prevents further thrombi formation; in our case none of these were given; probably due to difficulty in securing them at the referring hospital; the decision not to commence them in our institution was based on her clinical improvement; there were no new lesions, no further extension of the purpura or gangrene, rather some of the skin lesions resolved and she remained afebrile; this further heightens the controversy surrounding the use of these medications in purpura fulminans. Surgical debridement of necrotic tissue remains a standard of care; parents declined amputation despite adequate counseling, however the patient was commenced on honey dressing with good effect; sloughing was noticed by the 2nd week of treatment.

Conclusion

Purpura fulminans is a life-threatening hematologic emergency associated mostly with gram negative septicemia which requires aggressive management; however we have reported a case which was associated with hemiparesis following measles infection.

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