

## Peripheral Necrosis in an Ebola Survivor Case

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### Abstract

The most common symptoms in the present outbreak in West Africa region are fever, fatigue, vomiting, diarrhoea, loss of appetite, headache, abdominal pain and myalgias. However, a case of peripheral necrosis was observed in Sierra Leone where the tips of the fingers of both the hands get necrosis in a survivor of Ebola infection. The present case study discusses the findings and the pathology of the same.

**Keywords:** Ebola; Complications; Peripheral necrosis

### Introduction

Ebola virus infects different types of cells after entering the body through breaks in the skin, mucous membranes or parenteral routes. Viral particles replicate rapidly within macrophages and dendritic cells, which are probably the first to be affected ones and cause their necrosis and release large numbers of new viral particles into extracellular fluid [1]. These infected macrophages produce tumor necrosis factor (TNF)- $\alpha$ , interleukin (IL)-1b, IL-6, macrophage chemotactic protein (MCP)-1, and nitric oxide (NO) [2]. These and other substances have also been identified in blood samples from Ebola-infected macaques and from acutely ill patients in Africa [3-5]. Breakdown products of necrotic cells also stimulate the release of the same mediators [6]. The extensive tissue damage caused by replication of virus in macrophages, dendritic cell and in parenchymal cells of the liver and other organs also plays a major role in fatal disease. Natural killer (NK) cells and T lymphocytes remain uninfected, but undergo apoptosis, further impairing immune function [7-9].

The most common symptoms in the present outbreak in West Africa region are fever, fatigue, vomiting, diarrhoea, loss of appetite, headache, abdominal pain and myalgias [10]. Symptoms may begin abruptly and progress from nonspecific (fever, fatigue, headache, myalgias, and malaise) to include abdominal pain, nausea, high-volume vomiting, and diarrhoea. Hiccups are uncommon but well described in the present and previous outbreaks [10, 11]. Patients who survive usually have a protracted recovery characterized by asthenia, weight loss, and migratory arthralgia. Skin desquamation and transient hair loss are also common. Late manifestations during convalescence are uncommon but include uveitis, orchitis, myelitis, parotitis, pancreatitis, hepatitis, psychosis, hearing loss and tinnitus [12]. The cause of these manifestations is unclear but they might be related to immune complex phenomena. It has been reported that the survivors of Ebola virus disease have developed late manifestations such as myalgias, asymmetric and migratory arthralgias, headache, fatigue, bulimia, amenorrhea, hearing loss, tinnitus, unilateral orchitis and suppurative parotitis, but peripheral necrosis leading to dry gangrene of fingertips have not been reported. During the current epidemic, a case with these signs was observed and has been presented in this case study.

### Case Report

This 32 years old male driver residing in Monkey bush of Waterloo- an area heavily affected with Ebola Viral Disease (EVD)-presented for the treatment of Ebola related symptoms in last week of December 2014. As he had been involved in caretaking of family with Ebola, he was admitted for suspicion of Ebola to the treatment centre at Waterloo and was confirmed as an Ebola case. He was treated there for five weeks and discharged in February 2015. During the final weeks in hospital,

he developed bilateral blackening of palm and fingers of the hands. The blackening of both the palms gradually disappeared in two weeks, but the fingertips are still showing necrosis of skin and subcutaneous tissues in March 2015 as shown in Figure 1. The encrossed tissues are gradually pilling off from the skin as visible in thumbs, but they are still attached on the fingertips with significant reduction of tissues in fingertips. The damage to the bony tissues could be assessed only after further investigations. The status of the fingertips after one year at the end of February 2016 is shown in Figure 2. It shows that most of the necrossed tissue has been peeled of and now only the scar and tissue oedema at the fingertips are present.

### Discussion

There are two major types of gangrene, referred to as dry and wet. Many cases of dry gangrene are not infected. All cases of wet gangrene are infected, almost always by bacteria. The most common sites for both wet and dry gangrene to occur are the digits (fingers and toes) and other extremities (hands, arms, feet, and legs). Dry gangrene, if it does not become infected and progress to wet gangrene, usually does not cause sepsis or cause the patient to die. However, it can result in local tissue death with the tissue eventually being sloughed off. Usually, the progression of dry gangrene is much slower (days to months) than wet gangrene because the vascular compromise slowly develops due to



Figure 1: March 2015 Photograph.

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**Figure 2:** Photograph after one year in Feb 2016.

the progression of diseases that can result in local arterial blockage over time. The stages are like wet gangrene (see above), except there is no infection, pus, wetness, or crackly-feeling skin because there is no gas production in the uninfected tissue. There are many diseases that may lead to dry gangrene; the most common are diabetes, arteriosclerosis, and tobacco addiction (smoking). Infrequently, dry gangrene can occur quickly, over a few hours to days, when a rapid arterial blockage occurs (for example, an arterial blood clot suddenly occludes a small artery to a toe). Dry gangrene often produces cool, dry, and discolored appendages (sometimes termed “mummified”) with no oozing fluid or pus, hence the term “dry.”

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