Chang et al., J Clinic Case Reports 2012, 2:7
DOI: 10.4172/2165-7920.1000129

Journal of Clinical Case Reports

Case Report Open Access

# Symmetrical Peripheral Gangrene in an Octogenarian Asian male with Multiple Morbidities: A case report

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## Abstract

**Introduction:** Symmetrical peripheral gangrene (SPG, or peripheral symmetrical gangrene, PSG) is defined as acute onset of symmetrical ischemic gangrene over multiple sites of acral area, mostly extremities and sometimes nose, ear or scalp, without vascular occlusion or vasculitis. The pathogenesis is still unknown but related to local ischemia due to disseminated intravascular coagulation, infection, or medications.

**Case presentation:** A 87 year-old Asian man was admitted to the intensive care unit under the impression of septic shock. Vasopressors were administered due to hypotension. However, bilateral cyanosis over limbs was noted gradually few days after the medications given. Dry gangrene over distal limbs developed even after we stopped the medication as early as possible.

**Discussion:** Symmetrical peripheral gangrene may be an indicator for disseminated intravascular coagulation and poor prognosis. Quick reversal of underlying disease and elimination of precipitating factors are both significant managements once symmetrical peripheral gangrene is diagnosed.

## Introduction

Symmetrical peripheral gangrene (SPG, or peripheral symmetrical gangrene, PSG) is defined as acute onset of symmetrical ischemic gangrene over multiple sites of acral area, mostly extremities and sometimes nose, ear or scalp, without vascular occlusion or vasculitis. Cases of SPG were reported since 1891 [1], but clinically rare. The pathogenesis of SPG is unknown, but it seems that any condition that critically diminishes the blood supply to acral regions for a long period can lead to this condition [2]. The commonest cause is disseminated intravascular coagulation (DIC), most often secondary to infection. Another documented cause is use of vasopressors [3]. Dopamine and Norepinephrine were commonly administered for critically ill patients, especially those under shock status. However, the vasoconstrictve effect by those agents could possibly elevate blood pressure at the sacrifice of the perfusion over distal limbs [4,5]. Here we present a case with septic shock developing symmetrical peripheral gangrene after administration of Dopamine and Norepinephrine.

## Case Report

A 87 year old Asian man was admitted with high-grade fever and progressive consciousness change. He had medical history of colon cancer with liver metastasis under regular chemotherapy every 2 weeks. His body temperature was 40.1°C, pulse-rate 133/min, respiratory-rate 22/min and blood pressure 64/40 mmHg. Chest X-ray revealed right side pneumonia patch. Urine analysis showed pyuria. Other laboratory investigations showed WBC: 2010/μl, and Procalcitonin: 48.25 ng/mL. Septic shock was considered. Empirical antibiotics and dopamine were given due to his critical condition. Blood and urine cultures yielded Escherichia coli. Acrocyanosis was noted on Day 5 of admission. For fear of limbs ischemia, dopamine was discontinued on Day 6. The condition did not get better during the following days. Norepinephrine bitartrate was then given with careful titration on Day 9. Unfortunately, most of the toes of both feet and right index finger developed dry gangrene later following the administration of Norepinephrine (Figure 1,2). On Day 16, Norepinephirne bitartrate was discontinued after blood pressure was stabilized (Figure 3). He was then transferred from the ICU to our hospice ward after all his family agreed on and signed a do-not-resuscitate order. However, his condition deteriorated in a subsequent episode of infection and passed away 2 weeks later.

## Discussion

SPG is a rare condition frequently associated with high mortality and serious morbidity. Previous studies revealed the mortality rate ranged from 35 to 42% [6,7]. DIC secondary to infection was involved in most cases of SPG in previous studies [7,8]. Pathologic examination of amputated specimens often showed microthrombi concentrated in the small vessels sparing the large vessels [9].

Hypercoagulation state might be induced by the malignancy itself. The following E. coli septic shock and use of vasopressors in this patient have culminated in the development of SPG. In the setting of DIC, hemorrhagic patches may coexist with the peripheral gangrene (eg, purpura fulminans). However, SPG might be the only clinical presen-

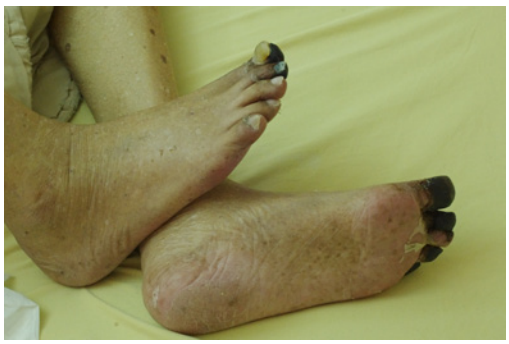

**Figure 1: Ischemic gangrene over bilateral toes.** Ischemic gangrene developed over bilateral toes even though the vasopressors were carefully titrated.

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**Received** March 17, 2012; **Accepted** April 09, 2012; **Published** April 18, 2012

**Citation:** Chang HW, Chern JPS, Kao CY (2012) Symmetrical Peripheral Gangrene in an Octogenarian Asian male with Multiple Morbidities: A case report. J Clinic Case Reports 2:129. doi:10.4172/2165-7920.1000129

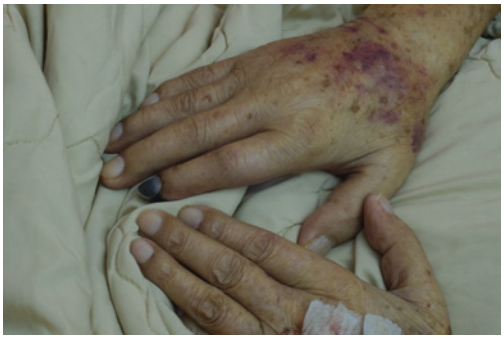

**Figure 2: Ischemic gangrene over right index finger.** Ischemic gangrene developed over right index finger even though the vasopressors were carefully titrated.

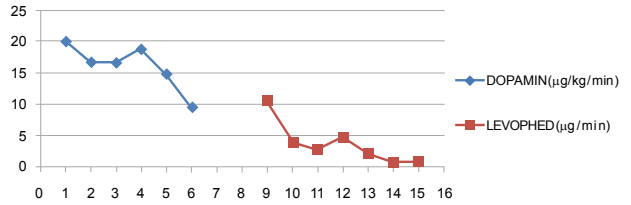


**Figure 3: Concentration of vasopressors and course of ischemia.** The concentration and daily dose of vasopressors was illustrated. Cyanosis was noted on day 5 but unstable vital signs kept us from discontinuing vasopressors. Gangrene was then noted on day 10.

tation of DIC [3]. In this patient, the predominantly peripheral distribution of the gangrene lesions were the most dominant characteristics, and no purpura fulminans was noted.

## Conclusion

Since there were no evidence based therapy for SPG, quick reversal of underlying disease (eg, sepsis, DIC) is of importance. Careful treatment and monitoring in ICU is suggested for patients with SPG. Elimination of precipitating factors such as vasopressors is also warranted. SPG may be an indicator for development of DIC, and management guided by coagulation test should be initiated as soon as it is recognized [10]. Detailed physical examinations of limbs perfusion should be performed if these vasopressors were administered, especially for those with significant risk factors.

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