

## Symmetrical Peripheral Gangrene Post Snake-Bite: An Unusual Presentation

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### ABSTRACT

Snake bite in India is a common yet neglected public health issue, with an estimated death rate of 50,000 per year. Symmetrical peripheral gangrene (SPG) has varied aetiology, but it is an unusual complication after snake bites. SPG is important as it causes significant morbidity and mortality, and early intervention may improve the outcome. Hereby, we report a case of SPG in young female with history of snake bite. The patient developed gangrene of bilateral foot and distal part of legs with necrotising fasciitis of right leg. In the literature, there are only few reported cases of SPG as a complication of snake bite.

**Keywords:** Symmetrical peripheral gangrene (SPG), Snake bite, Necrotising fasciitis

In 2009, World Health Organization included Snake bite and related complications in the list of neglected tropical conditions [1]. India reports the highest number of snake bites in the world with an estimated death of 50,000 per year [2]. This figure is still an underestimate as lots of cases are not reported [3]. Outcomes are worse as majority of the affected population is from rural areas and delay in seeking early medical care facilities. Some snake bites can lead to serious local and systemic manifestations like cellulitis, necrosis, acute renal failure, and haemorrhagic manifestations [4]. Early intervention plays a major role in these cases to improve the outcome.

However, unusual presentations of snake bite like symmetrical peripheral gangrene (SPG) makes the management of such patients more challenging. SPG is defined as symmetrical distal ischemic changes leading to gangrene in two or more sites in the absence of a major vascular occlusive disease [5]. Though the exact mechanism behind SPG is not known, early recognition can have profound impact on the management of the condition and its outcome [6].

### CASE REPORT

A 40 year old female patient presented to the emergency department with history of snake bite on right foot. The exact variety of snake was not known as patient was working in the farm and patient could not identify the variety of snake. Patient then developed swelling over right foot with blackening of the skin. Patient continued with home-made remedies. Three days later, patient started developing blackening of the skin of right foot associated with pain. Patient also started developing blebs over skin of the left leg for which she approached the nearest health centre but there was no improvement. Later, patient presented in the emergency department with gangrene of the bilateral foot, distal part of right leg and distal third of the leg with necrotising fasciitis of right lower leg (**Fig. 1**).

Cardiorespiratory parameters were within normal limits, peripheral pulses were palpable, and there was no signs of neurotoxicity or septicaemia. Blood investigations on admission revealed haemoglobin of 7.9 g/dl (11.0-16.0g/dl), leukocyte count of 12,800/mm<sup>3</sup> (4000-11,000),

and platelet count of  $369,000/\text{mm}^3$  with normal serum electrolytes ( $\text{Na}^+$ -135 meq/L and  $\text{K}^+$ - 4.1 meq/ L), and renal function tests (blood urea-20 mg/dl and serum creatinine-0.6 mg/dl). Her INR was 1.3, bleeding time was 1 min 39 sec and clotting time was 4 min 30 sec. A-V Doppler study of bilateral lower limb was normal without any obstruction.



**Figure 1 – Clinical image of patient at the time of admission**



**Figure 2 – Clinical image of the patient at the time of discharge**

Decision was taken to do above ankle amputation of bilateral lower limb along with fasciotomy and debridement of right lower limb. Post-operatively, patient was further evaluated for the cause. Her coagulation profile was normal, and tests for Anti-nuclear antibody and Anti-phospholipid antibody were negative. Echocardiography revealed no significant abnormality. As patient presented after 4 days of snake bite with no evidence of neurotoxicity or renal failure or other systemic manifestation of snake envenomation, anti-snake venom was not given. During further hospital stay, patient was managed with daily dressings, hyperbaric oxygen therapy, regular blood investigations and physiotherapy. Patient recovered completely (**Fig. 2**) and referred to plastic surgery department for the further management. Patient is in follow up since last 2 months with no progression of symptoms.

## DISCUSSION

Snake bite is a common medical emergency especially in rural areas and its immediate management reduces the mortality and morbidity. There are around 215 species of snakes in India, of which 60 species are poisonous [7]. Snakes fall into two categories Elapidae (Cobra, Krait) which are neurotoxic and Viperidae (Viper) which are hemotoxic. Snakes from Viperidae family are mostly hemotoxic with resultant effect of local pain, swelling, bleeding, blistering, tissue damage and necrosis of whole limb [8].

SPG is not an uncommon entity, characterized by distal gangrenous changes involving two or more peripheral limbs which are not attributed to peripheral vaso-occlusive disease. It may manifest as sepsis, oligouria, myeloproliferative disorders, hyperviscosity syndrome, connective tissue disorder, drugs and animal bites [6,9]. But, SPG is an unusual presentation of snake bite. It carries a significant morbidity with 70% to 90% amputation rate and upto 35% mortality [5]. Exact pathogenesis of SPG is not completely understood, but limited studies undertaken are suggestive of DIC as the common final pathway of its pathogenesis [7]. However, in this case, the presentation could not be attributed to any derangement in coagulation, as blood investigations for coagulopathy like platelet counts, aPTT, PT, INR, D-Dimer levels, APA were within normal limits. Drugs especially oral contraceptives in young married females can lead to thromboembolic phenomenon which can result in peripheral vascular disease [10]. However, in this case any form of thromboembolic phenomenon could not be attributed as bilateral lower limb and abdomen arterial venous Doppler studies, echocardiography as well as coagulation studies were normal. Connective tissue disorders can lead to SPG but no significant history and a negative Anti-nuclear antibody test ruled out the possibility of connective tissue disorder in our case.

Polyvalent anti-snake venom therapy should be ideally administered within 4 hours but is effective even if given within 24 hours [11]. Anti-snake venom is still the major treatment option even in the patients of extensive local swelling and other systemic manifestations like coagulopathy, renal failure etc. [12]. A delayed presentation with complications is common in cases of snake bites in India. Therefore, early administration of ASV is not possible in every case. This case presented

with delayed local complication of symmetrical peripheral gangrene with no associated systemic manifestations. Hence, ASV was not advised in this case and also its role in reversal of gangrene is doubtful [13].

## CONCLUSION

Symmetrical peripheral gangrene post snake bite is an unusual presentation of snake bite with high frequency of multiple limb amputation, disability and mortality. Its rarity in itself makes it novel. As the exact pathogenesis of the SPG is uncertain, the management of a case of SPG following snake bites has to be individualized and it should be primarily aimed at preventing immediate mortality, morbidity and long term disability.

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