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Case Report

Internal Medicine Section

Symmetrical Peripheral Gangrene Following Snake Bite

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ABSTRACT

SPG (Symmetrical peripheral gangrene) is defined as symmetrical distal ischemic damage at two or more sites in the absence of large vessels obstruction. It has been ascribed to a number of infectious and non infectious conditions including connective tissue, cardiovascular, neoplastic and iatrogenic causes. We report a unique case of SPG in a 35-year-old Indian female who developed spontaneous gangrene of the distal phalanges of the right and left index, middle, ring and little fingers and the distal phalanges of all toes of the right and left foot following a snake bite. There have been very few cases of peripheral gangrene and acute renal failure associated with snake bite in literature.

Keywords: Disseminated intravascular coagulation, Symmetrical peripheral gangrene, Snake bite

CASE REPORT

A 35-year-old Indian woman presented to the emergency room with history of snake bite on the left foot followed by 2-3 episodes of bleeding from the oral cavity. Over the next 24h she noticed a painful swelling of left foot upto the ankle that was accompanied by blackening and pain over multiple fingers of both hands as well as the toes of the right foot. She also developed gangrene of the left foot upto the ankle following snake bite. There was no history of convulsions, ptosis, diplopia, dysphagia or dysphonia. No history to suggest connective tissue disease was noted. The following day a marked decrease in urinary frequency and output was also noted. On examination pulse was 110/min and regular with a blood pressure of 94/60 mm Hg. Her peripheral pulses were normal. Examination of her hands and feet revealed well-demarcated gangrene of the distal phalanges of the right and left index, middle, ring and little fingers and the distal phalanges of all toes of the right and left foot [Table/Fig-1-4].

The patient was urgently admitted and evaluated for complicated snakebite. Laboratory investigation revealed Hemoglobin-8.5 g/dl (12-14g/dl), Leucocyte count-22000/mm^3(4000-11,000), Platelets-20000/mm^3 (1.5-4.5 lac/mm^3), blood urea-166mg/dl(15-45mg/dl), S. Creatinine-4.8(0.8-1.2mg/dl);suggestive of septicemia with acute kidney injury. The blood failed to clot in a glass tube over 20min. Disseminated intravascular coagulation was diagnosed based on the prolonged prothromin time (14.5 sec; 12-16 sec), a PTT (43.1 sec; control 25 sec) and elevated D-dimer level (780ng/ml ;<300 ng/ml) and low fibrinogen levels (80mg/dl; 200-400mg/dl).ANA test and Anti Phospholipid Antibody test was negative. A skin biopsy was considered to rule out vasculitis, however, due to the morbid state and coagulopathy, it was defered. A colour doppler study of the upper and lower limb revealed normal flow without any obstruction.

She underwent several transfusions, regular haemodialysis and antibiotic therapy. She received polyvalent antisnake venom although there was a delay of more than 24h from bite to administration due to a delay in presentation. Owing to her prolonged thromboplastin time and the lack of evidence of benefit a decision was made against systemic anticoagulation. Despite this she died of septic shock, on the 21st day of her stay in the intensive care unit.

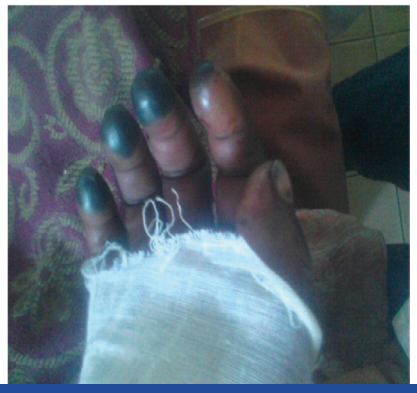
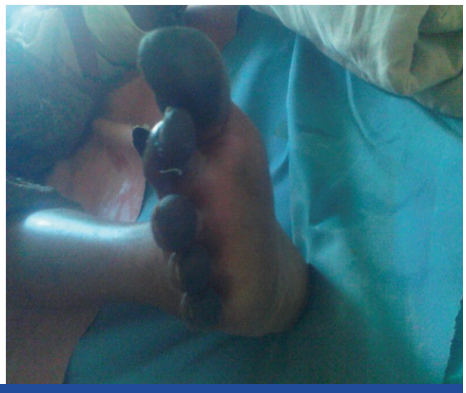
DISCUSSION

Symmetric peripheral gangrene (SPG) has been defined as symmetrical distal ischemic damage in more than two sites in the absence of major vascular occlusive disease. It carries a high mortality rate with a very high frequency of multiple limb amputations in the survivors. Disseminated Intravascular Coagulation (DIC) has been proposed as a unifying common pathway of its pathogenesis [1]. A number of conditions have been described as possible aetiological causes of SPG including infectious (including malaria in endemic countries), cardiovascular, connective tissue diseases, malignancies, medications(inotropic) drugs and some miscellaneous causes like hyperosmolar states or animal bites [2].

Snake bite remains a problem in the developing world. It has been estimated by the World health Organisation that there are 15 to 20 thousand deaths per year in India [3]. Viperine envenomenation can lead to a severe clinical syndrome including haemolysis, coagulopathy, acute kidney injury,rhabdomyolysis and neurotoxicity [3]. Coagulation abnormalities mostly attributed to DIC and primary

DATE	26/10/12	28/10	30/10	31/10	1/11/12	2/11	3/11	6/11	8/11	10/11	15/11
Hb	5.1	11.1	11.2		9.5		8.6	7.5	9.2		10.4
TC	18400	19800	15700		19000		41800	19000	19000		14600
PLATELET COUNT	42000	1.11	1.87		2.67		3.02	3.88	3.35		2.6
BLOOD UREA		244	152		130		94	112	167	147	133
S. CRT		7.9	5.4	6.8	5.1		4.3	3.2	3.7	4.0	2.5
PT			14.5	14.6		28.3	24		22.8	26.8	38.2
APTT			25.6	36.7		>100	30.2		32	31	30.2

[Table/Fig-1]: Serial labaratory investigations of the case., *Hb:Hemoglobin, TC: Total count, S. Crt: Serum Creatinine, PT: Prothrombin time, APTT :activated partial thromboplastin time.*

[Table/Fig-2]: Blackening over bridge of the nose **[Table/Fig-3]:** Peripheral gangrene over finger tips **[Table/Fig-4]:** Blackening and skin changes suggestive of gangrene over toes of foot contralateral to bite

fibrinolysis has been reported to cause gangrene of the bitten limb [4,5]. SPG has been labelled as the 'cutaneous marker' for DIC[2,6]. Disseminated gangrene at sites apart from the local bite site has been rarely reported with snakebites [7,8].Toxic vasculitis due to action of the toxins on vascular endothelium is also a possible mechanism inturn leading to DIC and thrombocytopenia [9]. Although, connective tissue diseases can lead to SPG and thrombocytopenia it was deemed unlikely in the case presented as there was no past or current history and ANA was negative. Another possibility includes inotropic drugs that are common in the ICU, however, in the case presented SPG was observed well before they were started and it is unlikely that their use was causative although the possibility of them contributing to it cannot be definitely ruled out. Widespread arterial thrombosis or embolism from a proximal source can also lead to disseminated cutaneous necrosis, but the doppler study showed normal flow making this improbable.

Anti snake venom remains the major treatment option for all patients with signs of systemic envenomation including coagulopathy, renal failure and extensive local swelling of the bite site. Early treatment in the 3-6h of systemic signs may be effective in reducing renal damage [10] however, there is little evidence on its effectiveness to reverse gangrene [11]. The delay in intiation of polyvalent anti snake venom in conjunction with standard care for sepsis and azotemia for the case reported, due to its delayed presentaiton, is likely to have contributed to the unfortunate outcome. The lethal conclusion in our patient is a reminder of how SPG can be an early sign of a severe underlying process and a predictor of a higher mortality and morbidity.

TEACHING POINTS

- SPG is a rare but well described marker of DIC, which may have a myriad of underlying aetiologies.
- Viperine snake bites can lead to a severe coagulopathy and renal compromise including disseminated intravascular coagulation.
- SPG is known to carry a high morbidity and mortality and should be recognised early and manged aggresively for the best outcome.

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