

SYMMETRICAL PERIPHERAL GANGRENE SECONDARY TO SEPSIS DUE TO ACUTE PYELONEPHRITIS

DEEPA D. V, GADWALKAR, SRIKANT R & RAVI S. L

Department of General Medicine, Vijayanagar Institute of Medical Sciences, Bellary, Karnataka, India

ABSTRACT

Introduction: Symmetrical Peripheral Gangrene is defined as symmetrical distal ischemic damage at 2 or more sites in the absence of large vessel obstruction, sometimes used synonymously as purpurafulminans. It may occur to due variety of causes like sepsis, DIC, hypotension, noradrenaline infusion, malignancies, connective tissue disorders.

Case Presentation: We present a case of severe sepsis due to bilateral acute pyelonephritis and developed symmetrical peripheral gangrene.

Conclusions: Symmetrical peripheral gangrene (SPG) is a rare but devastating complication of septicemia, with a high mortality (up to 40%). In this case, it could be secondary to severe sepsis. Other contributing factors could be hypotension and nor adrenaline infusion. SPG is associated with high rates of amputation. Main stay of therapy should be prompt recognition and treatment of sepsis, DIC and the underlying cause.

KEYWORDS: SPG, Acute Pyelonephritis, Sepsis.DIC

INTRODUCTION

Case Presentation

A 58 year male presented to us with 8 days history of fever with chills, bilateral loin pain and decreased urine output since 4 days. Patient had no history of diabetes and a non smoker. On examination, patient was febrile with tachycardia pulse rate of 108/min and hypotension with blood pressure of 80/50 mm/Hg. Per abdominal examination revealed that, bilateral renal angle tenderness. Patient was drowsy with no focal neurological deficits also had anuria with output of about 10ml/24 hours. Investigations revealed that, raised total blood counts $24,000 \text{ cells/mm}^3$ and thrombocytopenia with platelet counts of $80,000 \text{ cells/mm}^3$ and acute renal injury with creatinine levels of 4.8mg/dl. The Patient had hypoglycaemia, which was corrected and sensorium was improved. Prothrombin time, activated partial thromboplastin time and fibrinogen levels were normal. Urine examination revealed plenty of pus cells and red blood cells. Ultrasound abdomen revealed bilateral acute pyelonephritis. Electrocardiogram showed sinus tachycardia and chest X- ray was normal. Patient was diagnosed of severe sepsis and was started on Piperacillin- tazobactam and other supportive care including noradrenaline infusion.

Patient was dialysed in view of acute renal injury. Patient's general condition was improved, urine and blood cultures showed no growth. Over a week, patient has developed symmetrical blackish discoloration of all toes as showed in figure (1). Surgical opinion was sought, all peripheral pulses were well felt. Arterial and venous colour Doppler of both lower limbs were normal and vasculitis work up was negative. Patient was started on aspirin, pentoxifylline and heparin. There was no progression of gangrene and conservative treatment was suggested. A dermatological opinion was taken and

a diagnosis of symmetrical peripheral gangrene was made. After 4 weeks of therapy even after repeated dialysis patient’s creatinine levels is remained 10mg/ dl with urine output of 50ml/ 24 hours. Renal biopsy was done and revealed acute interstitial nephritis. Patient’s general condition was good but needed maintenance of hemodialysis. Patient was advised for AV fistula and discharged. At discharge his creatinine levels were 6.2 mg/dl and with no progression of gangrene. On follow up Patient is now on maintenance hemodialysis and his gangrene has remained same with no progression with reduced sensation in the toes.



Figure 1: Symmetrical Peripheral Gangrene Involving all Toes. First 3 Digits Show Dry Gangrene and Last 2 Digits Show Wet Gangrene Symmetrically

Table 1: Status of Investigations

Day of admission	1 st	2 nd	3 rd	At discharge
Random Blood glucose	34mg/dl	35mg/dl	89mg/dl	94mg/dl
Urea	106mg/dl	192 mg/dl		
Creatinine	4.8mg/dl	5.2mg/dl	11.0mg/dl	6.2mg/dl
Haemoglobin	10g/dl			11.2g/dl
Total counts	24,000/mm ³	24,500/mm ³	23,000/mm ³	8,000/mm ³
Platelet count	85,000/mm ³	80,000/mm ³	1,00,000/mm ³	2,20,000/mm ³
Urine routine	Microscopy Showed plenty of pus cells and red blood cells			
Prothrombin Time	14.0 Sec			
Electrocardiogram	Normal			
Fibrinogen levels	2g/L			
Urine culture	No growth			
USG abdomen	Bilateral acute pyelonephritis, right renal calculi			
Chest X ray	Normal			
Arterial blood gas analysis	Metabolic acidosis with compensatory alkalosis			
C3	Normal			
C4	Normal			
ANA	Negative			
Kidney biopsy	Acute interstitial nephritis			

DISCUSSIONS

Symmetrical peripheral gangrene (SPG) is a rare but devastating complication of septicemia, with a high mortality (up to 40%)¹. About half of the patients who survive require amputation of the affected limb.²Exact mechanism is not known. A low-flow state is commonly present in association with a hypercoagulable vasospastic situation leading to

microcirculatory occlusion. The ischemic changes begin distally and may advance proximally to involve a whole extremity. The pathogenesis of SPG may involve the Schwartzman reaction, bacterial endotoxin release, and platelet plugging in peripheral arterioles due to vascular collapse and DIC.³ Infective aetiologies include Pneumococcus, Staphylococcus and Streptococcus, but gram-negative organisms and falciparum malaria have also been implicated.^{4, 5} No treatment is universally effective. Early recognition and immediate discontinuation or reduction, if possible, of vasopressor therapy (as it aggravates the low-flow state by enhancing vasoconstriction) and vigorous therapy of sepsis and DIC with intravenous antibiotic therapy and heparinization^{2, 6} (if feasible) are essential components of SPG management. In the present case report, multiple aetiologies like sepsis, hypotension and noradrenaline infusion are implicated. Patient had already been off ionotropes, he was on higher antibiotics and heparin was started. After completion of 4 weeks of therapy creatine level is remained same, consistently creatine levels dropped, after repeated haemodialysis and prognosis was good. Recent literature points to a 100% association with DIC, high mortality rate of up to 35%, rates of amputation ranging from 70 to 90% and a possible association with the winter season.^{7, 8}

CONCLUSIONS

SPG commonly occurs with sepsis and DIC and infusion of ionotropes. In our case, sepsis was secondary to acute pyelonephritis. Patient also had hypotension and was also given nor adrenaline infusion. Patients have a high mortality and of those surviving may need amputation. Early recognition and prompt treatment of sepsis and judicious use of ionotropes will prevent the occurrence of this devastating condition.

ACKNOWLEDGEMENTS

Authors acknowledge the Dean and HOD, Department of Medicine, Vijayanagar Institute of Medical Sciences, Bellary, Karnataka

REFERENCES

1. Hutchison J. Severe symmetrical gangrene of the extremities. *Br Med J* 1891; 2:8-9.
2. Molos MA, Hall JC. Symmetrical peripheral gangrene and disseminated intravascular coagulation. *Arch Dermatol* 1985; 121:1057-61.
3. Tripathy S, Rath B. Symmetric peripheral gangrene: Catch it early. *J Emerg Trauma Shock* 2010; 3:189-90.
4. Rintala E, Kauppila M, Seppala OP, Voipio-Pulkki LM, Pettila V, Rasi V, et al. Protein C substitution in sepsis-associated purpurafulminans. *Crit Care Med* 2000;7: 2373-8.
5. Liechti ME, Zumsteg V, Hatz CF, Herren T. Plasmodium falciparum cerebral malaria complicated by disseminated intravascular coagulation and symmetrical peripheral gangrene: case report and review. *Eur J Clin Microbiol Infect Dis*. 2003; 22: 551-4.
6. Stossal TP, Levy R. Intravascular coagulation associated with pneumococcal bacteremia and symmetrical peripheral gangrene. *Arch Intern Med* 1970; 125: 876-8.
7. Ghosh SK, Bandyopadhyay D, Ghosh A. Symmetrical peripheral gangrene: a prospective study of 14 consecutive cases in a tertiary-care hospital in eastern India. *J Eur Acad Dermatol Venereol*. 2009; 23: 1-5.

8. Davis MD, Dy KM, Nelson S. Presentation and outcome of purpurafulminans associated with peripheral gangrene in 12 patients at Mayo Clinic. *J Am Acad Dermatol.* 2007; 57: 944–56.
9. Robert Baran, David A. R. de Berker, Mark Holzberg, Luc Thomas; Baran and Dawber's Diseases of the Nails and their Management: 4th edition; USA: Willey Blackwell 2012; 7: 322.