



## Surgery

## SYMMETRICAL PERIPHERAL GANGRENE IN A PATIENT OF OBSTRUCTIVE UROPATHY AFTER TREATMENT WITH IONOTROPES

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**ABSTRACT** Symmetrical peripheral gangrene (SPG) is a rare condition in which symmetrical ischemia and dry gangrene of the acral areas occur, which commonly includes toes, hands, scrotum, and earlobes, increasing the risk of limb amputation and affecting the quality of life. We hereby presented a case of 55-year-old male patient presented with obstructive uropathy with shock during his treatment for shock subsequently he developed bilateral gangrenous changes in upper and lower limb as well as penile gangrene managed by all four limb amputation without any post-operative complication.

### KEYWORDS :

#### INTRODUCTION

Symmetrical peripheral gangrene (SPG) is a rare condition in which symmetrical ischemia and dry gangrene of the acral areas occur, which commonly includes toes, hands, scrotum, and earlobes, increasing the risk of limb amputation and affecting the quality of life. The etiology is multifactorial but has been linked to vasopressor's use during the treatment of septic shock<sup>1,2</sup>. The vascular injury mechanism is disseminated intravascular coagulation (DIC)<sup>3,4</sup>. Several infectious and noninfectious etiologic factors have been associated with SPG<sup>5,7</sup>. It has been described in conditions associated with sepsis, low blood flow states, vasospastic conditions, hyper viscosity disorders, and myeloproliferative disorders<sup>8</sup>. The appearance of SPG related to the inappropriate use of vasopressor drugs also has been described<sup>9</sup>. Dopamine and norepinephrine are the first-choice drugs in septic shock cases due to their positive inotropic effects. SPG can occur with prolonged administration, especially at high infusion rates. SPG can cause catastrophic complications with high mortality rates and high frequencies of multiple limb amputations in up to 70% of surviving patients<sup>3,9</sup>. We present the case of a patient with SPG associated with vasopressor use who required amputation of all fingers and toes.

#### CASE REPORT

55-year-old male patient admitted to ICU with complaints of not able to pass urine since 3 days, laboured breathing since 1 day. Examination revealed blood pressure of 66/40 mm hg, pulse rate 129/minutes with normal saturation on room air. Blood investigations on admission revealed Hb of 5.7 g/dl, platelet count of 30000/microliter. Patient had an impaired renal function with Blood urea levels of 179mg/dl and sr. creatinine 5.0 mg/dl. Liver function was unremarkable. Systemic examination was within normal limits except bladder was palpable just below the level of umbilicus. No abnormalities noted in X-ray chest. On urine analysis plenty of pus cells and red blood cells were noted.

An abdominal ultrasound revealed normal sized bilateral kidneys with 2.5 cm calculus which is impacted in prostatic urethra, dilated left ureter with thickened and irregular bladder wall. Urinary bladder was overdistended. No hepatosplenomegaly was noted.

Patient was not on medications for Hypertension, Diabetes mellitus or and cardiac disease. There was no antecedent record of peripheral ischemia or smoking. Patient was resuscitated with intravenous fluids and started on antibiotics along with it bedside suprapubic catheterization done to drain stagnant urine. Around 2000 cc of muddy urine with sludge noted stat in urobag. Despite fluid resuscitation patient needed high dose of noradrenaline (8 mg in 50 cc 0.9% NS at the rate of 8ml/hr) to maintain his central venous pressure to normal level for 2 days after admission, dose reduced to 5 ml/hr on 3rd day then tapered and discontinued on sixth day after admission.

Seven days after admission ischemia started appearing on his bilateral fingers and toes along with glans penis. Ischemia progressed worst leading to erythematous cold extremities over the next days, which

gradually developed into dry gangrene and mummification after 2 weeks. Line of demarcation appeared on around 15 to 20 days after admission. In meantime peripheral artery doppler was carried out which suggested reduced low velocity biphasic flow in bilateral radial and ulnar arteries as well as anterior tibial, posterior tibial and dorsalis pedis artery with normal flow in proximal vessels. No E/O Thrombosis noted in any vessel.

Preoperative work up was carried out. Limbs were protected from further cold or trauma and amputation of bilateral upper limb fingers and b/l lower limb toes were carried out. For penile gangrene patient referred to urosurgery specialty.



**B/L UPPER LIMB**



**B/L LOWER LIMB**



**PENILE GANGRENE**



**POST OP B/L UPPER LIMB**



**POST OP B/L LOWER LIMB**

#### DISCUSSION

Shock is a term used to describe a clinical syndrome that develops when there is critical impairment of tissue perfusion due to some form of acute circulatory failure, shock does not mean merely hypotension even though two are often used together<sup>10</sup>. Low perfusion associated with shock will ultimately lead to ischemia. It is a well-known fact that perfusion in digits will drop almost to zero if persistent perfusion pressure is 35 to 55 mm hg<sup>11</sup>.

Apart from drugs there may be various other etiologic factors for

peripheral symmetrical gangrene such as bacterial, viral, malignancy, connective tissue disorders, along with that aggravating factors are diabetic mellitus, renal failure<sup>12,13,14</sup>.

Patient presents with pallor or sometimes cyanosis, cold peripheries, and pain in extremities in initial phases if proper care is not taken in this period digits may progress to become erythematous which is followed by discoloration of skin. Development of bullae or blisters subsequently leads to formation of gangrene. Septic shock affects multiple organs hampering their microcirculation and also has effect on coagulation. Treatment with noradrenaline which is most commonly used vasopressor stimulates B1 and  $\alpha 1$  adrenergic receptor and causes increased contractility and an improved heart rate and has more effect on digital vascular bed and hence it should not be surprising to find gangrene on high doses.<sup>15,16</sup>

Vasopressin receptors are present in smooth muscles of blood vessels mainly in splanchnic circulation, kidney, myometrium, hepatocyte, bladder, adipocytes, testis and skin circulation this wider areas of skin on thighs, calf are affected by vasopressin induced gangrene in contrast noradrenaline induced skin necrosis occurs on fingers and toes.<sup>17,18</sup>

Early recognition and prompt management should be the strategy in treating peripheral synergistic gangrene. With preventive means having ace importance, the first line of management includes aggressive resuscitation with fluids, and the aim to discontinue vasopressors support as soon as possible.

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