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A rare case of symmetrical four limb gangrene following emergency neurosurgery

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ABSTRACT

INTRODUCTION: The authors report a case of symmetrical peripheral gangrene (SPG) following emergency neurosurgery.

PRESENTATION OF CASE: A 35-year-old female presented to hospital in Thailand with nausea, headache, and subsequent seizures. She was found to have a large intracranial space-occupying lesion with mass effect. Following emergency surgical debulking and decompression, she suffered from severe sepsis with multiple organ failure, treated with high dose intravenous vasopressors and developed secondary gangrene in all four limbs. She was repatriated to the UK with a baseline GCS of 8 and multiple postoperative medical complications. With initial conservative management, the patient made a prolonged but satisfactory progression to recovery prior to semi-elective debridement and selected digit amputation of the gangrene.

DISCUSSION: This is the first reported case of four limb symmetrical peripheral gangrene following an emergency craniotomy.

CONCLUSION: Although rare, SPG is a substantial complication with high mortality and morbidity and therefore should be especially taken into account for emergency intracranial pathologies in neurosurgical patients, particularly if they require emergency surgery.

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1. Introduction

Symmetrical peripheral gangrene (SPG) is defined as distal ischaemic damage in two or more extremities, without large vessel obstruction or vasculitis [1]. It is associated with various underlying medical conditions and is a rare but significant complication of septicemia, with up to 40% mortality [2]. Aggravating factors include asplenia, immunosuppression, previous cold injury to extremities, diabetes mellitus, renal failure, increased sympathetic tone and the use of vasopressors [3–5].

We report a case of severe four limb SPG secondary to combined septicaemia and vasopressor use following emergency surgery for a haemorrhagic brain tumour in a young patient.

2. Presentation of case

A 35-year-old female presented to hospital in Thailand with nausea, headache, and subsequent seizures. An MRI head showed a left frontal lobe tumour with surrounding oedema, midline shift, uncal/transtentorial herniation, and hydrocephalus. An emergency craniotomy and debulking/decompression was performed. Following surgery, the patient developed severe urosepsis, septic shock and multi organ failure, which required treatment with high dose intravenous (IV) noradrenaline. Unfortunately, this led to secondary ischaemia in all four limbs. The histology of the tumour confirmed a WHO grade III anaplastic astrocytoma.

The patient had a previous history of an astrogloma resected 10 years ago and Crohn's disease. She was previously fit otherwise, with no predisposing factors for postoperative septicaemia.

After 5 weeks of intermittent intubation and ventilation while receiving treatment for other postoperative complications including acute respiratory distress syndrome (ARDS), disseminated intravascular coagulation (DIC), hospital acquired pneumonias and acute kidney injury (AKI), she was repatriated to the UK with a GCS of 8 (E4V1M3) and four-limb gangrene (Figs. 1–4). At this stage she was NG fed due to unsafe swallowing, unable to speak or obey commands and only moved her limbs in response to pain. On admission to the UK hospital, Hb was 89 g/L, platelets was $382 \times 10^9/L$, WBC

Abbreviations: SPG, symmetrical peripheral gangrene; GCS, Glasgow coma score; DIC, disseminated intravascular coagulation; ARDS, acute respiratory distress syndrome; AKI, acute kidney injury.

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Fig. 1. Dorsal and palmar aspects of right hand.



Fig. 2. Dorsal and palmar aspects of left hand.

was $12 \times 10^9/L$, CRP was 11 mg/L, urea was 17.6 mmol/L, creatinine was $313 \mu\text{mol/L}$. Blood, wound, faeces, and catheter tip cultures were all negative. Subsequent rectal swabs isolated *Klebsiella*, which was resistant to all antibiotics tested except Amikacin, Mecillinam, and Meropenem. Tests for HIV, hepatitis B and C were all negative. After over a month of hospitalisation, her wound culture was positive for *Staphylococcus aureus*.

She was cared for in isolation under strict barrier nursing due to infection control concerns. Management was primarily conservative with analgesia, anticonvulsants, and NG feeding. IV antibiotics (Amikacin, Meropenem) were only given when she spiked temperatures and had raised inflammatory markers.

We continued to monitor her progress with input from the neuro-oncology, neuro-rehabilitation, and plastic surgery teams. Her GCS has improved and now remains at 15. Her biochemistry

parameters continued to oscillate throughout her admission. Prior to discharge, Hb was 103 g/L, platelets was $51 \times 10^9/L$, WBC was $2.4 \times 10^9/L$, urea was 8 mmol/L, creatinine was $41 \mu\text{mol/L}$. Final blood cultures remained negative. Her distal gangrene was initially managed conservatively with dressings but due to her prolonged admission in hospital for repatriation closer to home, it was decided for her to have a semi-elective focused debridement and amputation of selected digits of all four limbs. She has now recovered completely from this procedure and will be followed up by the plastic surgery team as an outpatient. She has been discharged with an ability to converse with her family and friends, obey commands in terms of motor response, and eat and drink a normal diet. She has been repatriated closer to her family and friends for on-going rehabilitation and therapy with a view of eventually being able to return to her own family home.

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