

Symmetrical Peripheral Gangrene resulting from application of henna: a rare clinical occurrence

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Abstract

Symmetrical Peripheral Gangrene (SPG) is a rare clinical syndrome characterized by bilateral symmetric distal limb ischemia leading to gangrene with no evidence of major vascular occlusive disease. The peripheral pulses are usually palpable as a result of the sparing of larger vessels. The mechanism of vascular occlusion is poorly understood. Disseminated intravascular coagulation has been implicated as the final common pathway in its pathogenesis. Initial management is resuscitation followed by amputation when the gangrene becomes demarcated. We report a rare case of symmetrical peripheral gangrene of both hands and feet in a 28-year-old female who presented with pain and darkening of all her fingers and toes for 2 days following the application of henna, with no medical history of the known predisposing conditions. She had amputation of the digits of her hands and tarsometatarsal amputation of her feet bilaterally. She had an uneventful post-operative period and was discharged to see the outpatient department. While reported cases of SPG due to numerous etiologies can be found in the literature, this is to our findings the first time we are seeing it resulting from the cosmetic use of henna. The intriguing case presented here was brought about by the application of henna used as a cosmetic agent and was characterized by a very rapid clinical course with no other apparent predisposing etiology.

Introduction

Symmetrical Peripheral Gangrene (SPG) is a rare clinical syndrome characterized by bilateral symmetric distal limb ischemia leading to gangrene with no evidence of major vascular occlusive disease.¹ Other acral areas may be involved, such as the nose, ears, or vertex of the scalp. It was first described by Hutchinson in 1891. Although SPG has been described for decades, information dealing with its management is scant.² It is usually associated

with a wide range of underlying medical conditions, and may result in multiple limbs or digital amputation. The precise pathogenesis of the vascular occlusion in SPG is uncertain. However, a typical clinical presentation of SPG despite large number of etiological associations is suggestive of Disseminated Intravascular Coagulation (DIC) as a final common pathway of its pathogenesis.³ Some authors have in fact described it as a cutaneous marker of DIC.⁴ The ischemic changes begin distally and may advance proximally to involve the whole extremity. Initial management is resuscitation followed by amputation when the gangrene becomes demarcated.⁵ We report a rare case of symmetrical peripheral gangrene of both hands and feet in a 28-year-old female who presented with pain and darkening of all her fingers and toes for 2 days following the application of henna without any medical history of the known predisposing conditions.

Case Report

A 28-year-old female patient presented to the Accident and Emergency Unit of the Aminu Kano Teaching Hospital, Kano, Nigeria, with a 2-day history of pain and darkening of all her fingers and toes. A week prior to presentation, she had developed constant rest pain in her hands and feet following the application of a locally prepared henna mixture on all her digits by way of an occlusive dressing. Her fingers and toes became dusky in appearance, with associated blistering of the fingers. She had no history of intermittent claudication. She did not drink alcohol or smoke, and she had no known chronic illnesses. There was no family history of diabetes mellitus, hypertension, heart disease, dyslipidemias, and connective tissue disorders. Her past medical history was not significant. She was negative for Human Immunodeficiency Virus (HIV) and was not on any routine medications. She had a pulse rate of 90 beats per minute, with a blood pressure of systolic 120 mm Hg and diastolic of 70 mm Hg. Examination of the hands showed mixed gangrene of all the fingers, which had started demarcating, and gangrene of all her toes. She had good peripheral pulses of full volume in both her upper and lower limbs (Figure 1). Other systems were essentially normal. Laboratory investigations revealed normal findings of complete blood count, random blood sugar, and U/E/Cr. ESR was 25mm/hr. Blood culture was negative. Doppler study of the limbs, D-dimer assay, protein C and S assay, and diagnostic arteriography were not done due to

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patient financial constraints.

She had fluid resuscitation and parenteral antibiotics, which were commenced on admission. Analgesics were also given. The informed consent for amputation of the gangrenous parts of her hands and feet was obtained. She had amputation of the digits of her hands and tarsometatarsal amputation of her feet bilaterally (Figures 2 and 3).

Discussion

SPG is a rare clinical condition associated with symmetrical ischemia and gangrene of the distal extremities.^{1,6} Our patient developed bilateral symmetrical gangrene of all digits. The condition is associated with a wide spectrum of infective and non-infective etiological causes.⁷ Non-infective causes include, but are not limited to, malignancy, renal failure, diabetes mellitus,

immunosuppression, hypovolemic shock, myeloproliferative disorders, vasospastic conditions, hyperviscosity syndromes, connective tissue disorders like Systemic Lupus Erythematosus (SLE) and antiphospholipid antibody syndrome among other causes.^{7,8} Drugs like noradrenaline, adrenaline, and dopamine have also been documented as causative agents in some patients.³ The exact pathogenesis of the condition is not well understood. However, the underlying mechanism includes a low-

flow state with DIC. A mortality rate of 35% has been reported in association with DIC.⁹ Despite the wide array of etiological causes for SPG, it is not uncommon to fail to identify an underlying cause. While SPG is well documented in the literature, to our knowledge application of henna for cosmetics has not been previously reported as a cause. The phenomenon in this case was not precipitated by a known trigger of SPG, which in this case is the application of a mixture of henna, petrol, hydrogen peroxide, lemon, and urea fertilizer — all of which are not individually known to be a causative agent of SPG. It is often difficult to isolate the cause of vascular occlusion in SPG. In the early stages, pulses may still be palpable, and the large vessels are often spared. As distal extremities are especially susceptible, these changes begin distally and may progress proximally to involve the entire limb.

Currently, no treatment has been found to be completely effective. However, early recognition remains the key factor in management.¹⁰ If peripheral perfusion appears to be uncertain, aggressive fluid resuscitation is recommended with the aim to discontinue or reduce the precipitating etiology at the earliest possible chance. Treatment of sepsis and DIC with IV antibiotics and low-dose heparin, respectively, where feasible, should be instituted promptly.¹¹ Other modalities tried with variable degrees of success includes sympathetic blockade, IV vasodilators, local injection or IV infusion of alpha-blockers, and IV prostaglandins, especially after the appearance of digital ischemia.^{10,11}

The amputation of the gangrenous tissue(s) may become inevitable, but an initial nonsurgical approach allows time for the patient's condition to be stable and for the gangrene to become well-demarcated.⁵

Conclusions

The patient that we have reported in this article was a 28-year-old female without any medical history suggestive of a known predisposing condition for SPG. A vital point in this patient is that she presented to the casualty ward after a rapidly progressing acral limb gangrene following the application of the henna mixture. She had no reduction in blood flow to distal peripheries, as evidenced by the presence of peripheral pulses. It is difficult to ascertain if any of the components of the cosmetic mixture, individually or in combination, contributed to the gangrene.

We conclude that the combination of all substances in the mixture may have contributed since none of the substances individually have been implicated from the literature to be a predisposing cause without other added predisposing pathology. Even though endarteritis resulting from vascular spasm may not be entirely ruled out

Awareness, early recognition, and prompt management, including adequate fluid resuscitation and removal of the etiological agent, are necessary to avoid catastrophic outcomes such as multiple limb gangrene.

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Figure 1. Gangrenous toes and fingers.



Figure 2. Stumps of amputated toes.



Figure 3. Stumps of amputated fingers.