Gangrene Secondary to Deep Venous Thrombosis

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Abstract

Venous gangrene is a rare and often fatal complication of deep venous thrombosis, usually involving the lower extremities. Common underlying conditions are neoplastic disease, postpartum state, and postoperative state. To diagnose venous gangrene, it is necessary to establish that there is deep venous thrombosis without arterial occlusion. Cyanosis is a characteristic sign that appears before the onset of irreversibility. The role of thrombolytic therapy is uncertain.

Introduction

Venous gangrene is an unusual and severe form of venous thrombosis of an extremity. The condition is associated with a high mortality, either from pulmonary embolism or underlying disease such as neoplasm.

In a review by Haimovici, 388 limbs (321 patients) with an ischemic form of venous thrombosis were studied. 51% had venous gangrene, and 49% were thought to have phlegmasia cerulea dolens. Among those with venous gangrene, the lower extremities were involved in 89% and the upper extremities in 11%. Common underlying conditions were neoplastic disease, postpartum state, and the postoperative state.

Pathophysiology – What determines if a patient will have usual DVT or develop gangrene?

Phlegmasia cerulea dolens and venous gangrene have an overlapping presentation, and they constitute a reversible and irreversible subdivision of ischemic thrombophlebitis respectively. At the outset, the gangrenous process appears to involve the skin and the subcutaneous tissues preferentially.
Later, myonecrosis and ischemic neuritis develop.¹

**Diagnosis**

To diagnose gangrene of venous origin, it is necessary to establish that there is deep venous thrombosis without arterial occlusion.⁴ The onset of venous gangrene is usually sudden.⁴ Cyanosis is a characteristic sign that appears before the onset of irreversibility.¹⁴ It appears early, develops rapidly and extends to the entire extremity.³ Its maximum intensity is at the distal parts (toes, heels and fingers). ⁴ Areas of deep red discoloration then develop, progressing to purple or black, often accompanied by bullae filled with dark fluid (Figure 1).¹⁵ Blistering in the gangrene may be most prominent on the toes and dorsum of the foot.¹⁵

Gangrene is wet and appears to develop slowly in most cases as compared to that from arterial occlusion.⁴ Pain of venous gangrene tends to be more intense than in the common form of thrombophlebitis.⁴ Edema may be absent at the inception, but then becomes extensive.⁴ Edema has a woody consistency.⁴ Skin temperature is sometimes conserved.⁴ Peripheral arteries are patent.⁴

**Gangrene**

Early intervention may improve outcome.⁶ High elevation of leg with regular passive flexion to express the entrapped blood diminishes venous engorgement, and allows fresh arterial blood to enter.⁷ Low molecular weight heparin provides promise as a safe and effective measure in the management of venous thromboembolism and gangrene.⁸ Several investigators suggested the use of thrombolytic agents in phlegmasia cerulea dolens⁹¹², although there is disagreement about the efficacy and safety of this treatment. Bhardwaj et al¹³ reported a case of venous gangrene treated successfully with thrombolytic therapy and subsequently by skin grafting.

In summary, venous gangrene is rare and often fatal complication of deep venous thrombosis, usually involving the lower extremities. To diagnose venous gangrene, it is necessary to establish that there is deep venous thrombosis without arterial occlusion. The role of thrombolytic therapy is uncertain.

**References**