

# Surgical Thrombectomy for Phlegmasia Cerulea Dolens

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Phlegmasia cerulea dolens (PCD) is a medical emergency that can lead to venous gangrene of the lower extremity. Early diagnosis and prompt treatment is crucial for limb salvage. There are two treatment options (endovascular or surgical). In the endovascular era, catheter-directed thrombolysis is the treatment of choice to achieve venous outflow. However, surgical thrombectomy is indicated in certain cases. The authors report successful surgical thrombectomy in a 75-year-old man with PCD and review the treatment of PCD.

**Key Words:** Venous thrombosis, Thrombectomy, Gangrene

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## INTRODUCTION

Massive ilio-femoral deep vein thrombosis (DVT) may cause phlegmasia cerulea dolens (PCD, blue swollen leg). PCD is a rare form of DVT and venous gangrene may occur as arterial inflow becomes obstructed because of extreme levels of venous hypertension [1]. The primary treatment goals in PCD include restoration of venous outflow, prevention of thrombus formation and preservation of collateral circulation [2]. There are no therapeutic algorithms due to its rarity, but for limb salvage, emergent venous thrombectomy or thrombolytic therapy is necessary [3]. Here, we report a case of PCD treated successfully by surgical thrombectomy.

## CASE

A 75-year-old male presented at our emergency department with painful swelling of his left leg for 12

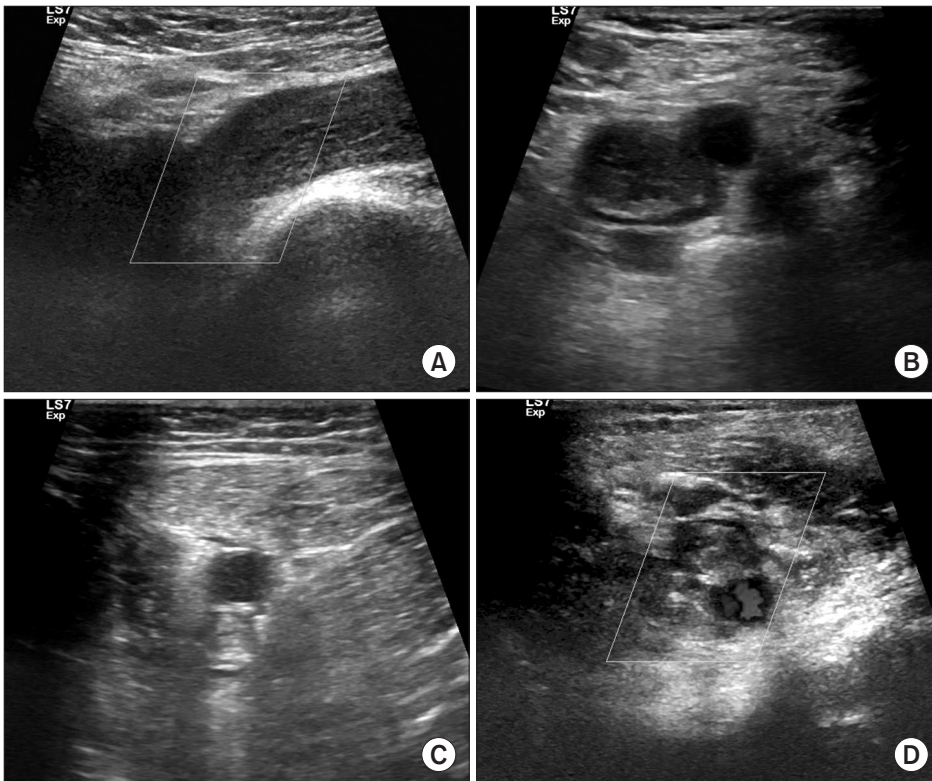
hours without prior trauma history (Fig. 1A). He also complained of numbness and weakness of the left lower leg and foot. His medical history was notable for hypertension and hyperlipidemia. On physical examination, the entire leg showed purplish discolorization and left femoral and dorsalis pedis artery pulses were detectable by hand-held Doppler. Duplex ultrasound (DUS) revealed left ilio-femoro-popliteal DVT (Fig. 2). Intravenous heparin was immediately administered and an emergent venous thrombectomy was performed under local anesthesia (Fig. 3), which provided pain relief. The next day, the left leg color was normalized (Fig. 1B) and motor and sensory defects were fully recovered. Anticoagulation therapy was prescribed for 6 months and follow-up computed tomography (CT) at 6 months revealed no residual thrombus (Fig. 4).

## DISCUSSION

The pathophysiology of PCD involves extensive venous



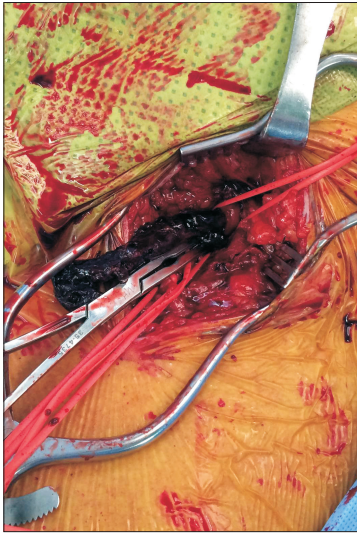
**Fig. 1.** The patient's lower extremities at presentation (A) and postoperative day 1 (B).



**Fig. 2.** Duplex ultrasound revealed thrombotic occlusion of the left external iliac vein (A), common femoral vein (B), femoral vein (C), and popliteal vein (D).

obstruction leading to increased interstitial tissue pressure, arrest of capillary blood flow, tissue ischemia and ultimately gangrene, which can cause limb loss and even death. Reported mortality rates range from 20% to 41% and reported amputation rates among survivors range from 12% to 50% [4].

Prompt diagnosis and adequate treatment is crucial for avoiding limb loss and death. The first line diagnostic



**Fig. 3.** Venous thrombectomy was done with 4 Fr Fogarty catheter.

modality for DVT is DUS, which can rule out the possibility of arterial occlusion. When a diagnosis of PCD is made, heparin should be administered and thrombus removal conducted as soon as possible to restore venous outflow. There are two primary options for thrombus removal, that is, venous thrombectomy or endovascular methods, such as catheter-directed thrombolysis, mechanical thrombectomy, or pharmacomechanical thrombectomy [3]. Treatment selection depends largely on the extent of ischemia as determined by the clinical categories of acute limb ischemia (ALI) [5]. Endovascular treatment is the initial treatment of choice for class I or class IIa ALI, and surgical thrombectomy is indicated for a profoundly ischemic limb (class IIb ALI) [6]. Barham and Shah [7] reported a case of PCD that progressed to venous gangrene despite continued intravenous anticoagulation therapy and mechanical thrombectomy. In this patient, we adopted surgical thrombectomy to achieve venous outflow more quickly because he showed sensory loss and muscle weakness (class IIb ALI). In addition, surgical thrombectomy can also be considered when thrombolytic therapy fails or thrombolytic therapy is contraindicated. However, if profound irreversible ischemic change is apparent in the affected limb, primary amputation should be performed.

In conclusion, PCD is a rare fulminant condition of DVT and surgical venous thrombectomy is a useful treatment option for limb salvage.



**Fig. 4.** (A-E) Follow-up computed tomography (CT) showed no residual thrombus of the left ilio-femoro-popliteal vein.

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