A Case of Progressive Mortal Thrombosis: Phlegmasia Cerulea Dolens

Khalid Zeynalov,[1] Burak Ozkan,[1] Tankut Akay,[2]
A. Cagri Uysal,[1] Mehmet Haberal[3]

ABSTRACT

Phlegmasia cerulea dolens is a very rare set of conditions associated with acute, massive venous thromboembolism. Medical and surgical options can be combined in treatment. Patients may experience sudden onset and severe leg pain, edema, cyanosis, compartment syndrome, and post-venous gangrene amputation and death. Medical and surgical treatments can be combined in treatment. Anticoagulants, thrombectomy, percutaneous procedures and amputations are among the treatment options. We present a 60-year-old female patient with a diagnosis of diabetes mellitus with swelling, pain, and discoloration in the left lower extremity who died due to progressive venous thrombosis despite various treatment modalities. Wound debridement and thrombectomy were performed. On day 10 of hospitalization, the patient was intubated to treat resistant low saturation. Despite the interventions, the patient died on day 10 of hospitalization due to cardiopulmonary arrest. Early diagnosis and treatment are vitally important. As in the case we presented, sometimes patients die as a result of rapid clinical progression and side effects, despite the use of different medical and surgical treatments.

KEY WORDS: ***Acute, Lower extremity, Thrombosis, Venous***

INTRODUCTION

Phlegmasia cerulea dolens is a set of conditions associated with acute, massive venous thromboembolism.[1] Patients may experience sudden onset and severe leg pain, edema, cyanosis, compartment syndrome, amputation after venous gangrene, and death. Medical and surgical treatments can be combined in treatment. Anticoagulants, thrombectomy, percutaneous procedures, and amputations are among the treatment options.[2]

In this study, we present the case of a patient who applied to us with swelling, pain, and discoloration in the left lower extremity and died due to progressive venous thrombosis despite various treatment modalities.

CASE REPORT

A 60-year-old female patient with a diagnosis of diabetes mellitus was admitted to our hospital due to a foul-smelling and inflamed wound on her left foot. On physical examination, there was significant pain in the left leg (Figure 1). The left foot and leg were observed to be markedly edematous. Left lower extremity distal pulses were not palpable. She had been diagnosed with phlegmasia cerulea dolens 1 month previous at an external center. Her medical information indicated that warfarin 5 mg had been started for

FIGURE 1. Clinical View of the Left Foot at the Time of Admission

From the [1]Department of Plastic, Reconstructive and Aesthetic Surgery; the [2]Department of Cardiovascular Surgery; and the [3]Department of General Surgery, Baskent University, Ankara, Turkey

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CORRESPONDING AUTHOR: Burak Ozkan, Department of Plastic, Reconstructive and Aesthetic Surgery, Baskent University, Ankara 06900, Turkey

E-mail: drburakozkan@gmail.com

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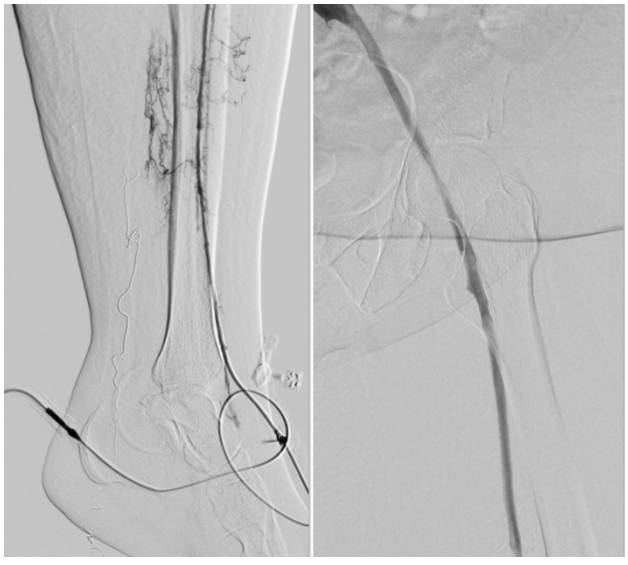
a month, vena cava inferior filter had been placed 10 days previous by the cardiovascular surgery team at the external center, and mechanical thrombectomy and thrombolytic treatment had been applied for thrombi detected in the left lower extremity crural vein, popliteal vein, femoral vein, and iliac vein (Figure 2).

After her complaints did not regress, thrombolytic therapy was performed for occlusions up to the popliteal vein, and mechanical restorative/repair thrombectomies was performed for thrombi in the femoral and iliac veins, by entering from the dorsum of the left foot. In the control venography from the previous hospital, it was reported that the anterior tibial vein was partially opened, there was still thrombus in the popliteal vein, and the superior popliteal vein and iliac vein were patent. During the previous surgical interventions, she had received intravenous tissue plasminogen activator 2 mg/h, intravenous heparin 500 U/h, cilostazol (2 doses of 100 mg each), and subcutaneous enoxaparin sodium (2 doses of 0.6 mg each). She had been discharged with enoxaparin sodium and cilastrozole 4 days before her application to us. At the time of admission, her blood pressure was 120/80 mm Hg, pulse was 115 beats/min, respiratory rate was 22 breaths/min, temperature was 37.9 °C, and oxygen saturation in room air was 95%. Laboratory tests showed hemoglobin 10.9 g/dL (reference range, 12-16 g/dL), platelet count 66 × 10^3 cells/mL (reference range, 150-400 × 10^3 cells/mL), white blood cell count 10.15 × 10^3 cells/mL (reference range, 4.5-11 × 10^3 cells/mL), C-reactive protein 154.6 mg/L (reference range, 0-5 mg/L), prothrombin time 15 seconds (reference range, 10-14.5 seconds), international normalized ratio 1.31 (reference range, 0.8-1.2), D-dimer 2.53 mg/L (reference range, 0-0.44 mg/L), and potassium 3.2 mmol/L (reference range, 3.5-5.2 mmol/L).

FIGURE 2. Femoral level Mechanical Thrombectomy and Thrombolytic Treatment Were Applied to Left Lower Extremity by Interventional Radiology



Let shows distal tibial level, and right shows femoral level.

The patient was admitted to the plastic surgery service. Because of the patient's high blood sugar level, diabetic treatments were arranged. Doppler ultrasonography was performed to investigate pretibial edema and discoloration of the left leg. In the examination, thrombosis was observed in the left popliteal vein, left main femoral vein, and left superficial femoral vein (Figure 3). No pathology was detected in the arterial circulation. Low-molecular-weight heparin and cilostazol treatments were continued with the recommendation of the cardiovascular surgery team. In addition, 75 mg clopidogrel and 100 mg aspirin, as well as heparin infusion at a dose of 15 U/kg, was started. The patient developed tachycardia and was started on metoprolol 50 mg treatment with the recommendation of the cardiology team. The echocardiography evaluation revealed left ventricular concentric hypertrophy. Other cardiac anatomic structures were normal. Intravenous furosemide was used for pretibial edema.

Three days after hospitalization, color change in the right foot and bullae became evident. Doppler ultrasonography performed for the right leg revealed thrombi in the right main femoral vein, along the entire tracing of the superficial femoral vein, in the part of the superficial femoral vein extending to the proximal part of the vena saphenous magna, in the popliteal vein, and in the vena saphena magna. On day 6 of hospitalization, clopidogrel and aspirin treatments were stopped and warfarin 5 mg treatment was started. On day 9 of hospitalization, due to the development of compartment syndrome in both lower extremities, mechanical thrombectomy was performed by entering the popliteal vein (Figure 4). After the venotomy was closed, the fasciotomy was opened.

The patient was taken to the intensive care unit. Because of her hypotensive course, an intravenous infusion treatment of 10 μg/min noradrenaline was started. The patient received 2 units of fresh-frozen plasma and 3 units of erythrocyte suspension. On day 10 of hospitalization, the patient was intubated to treat resistant low saturation. Despite the interventions, the patient died on day 10 of hospitalization due to cardiopulmonary arrest.

DISCUSSION

Phlegmasia alba dolens and phlegmasia cerulea dolens are conditions associated with acute, massive venous thromboembolism, with high morbidity and mortality. In addition to phlegmasia alba dolens, phlegmasia cerulea dolens

FIGURE 3. Thrombus Formation Was Detected in Doppler Ultrasonography at the Bifurcation of Femoral Vein and Popliteal Vein

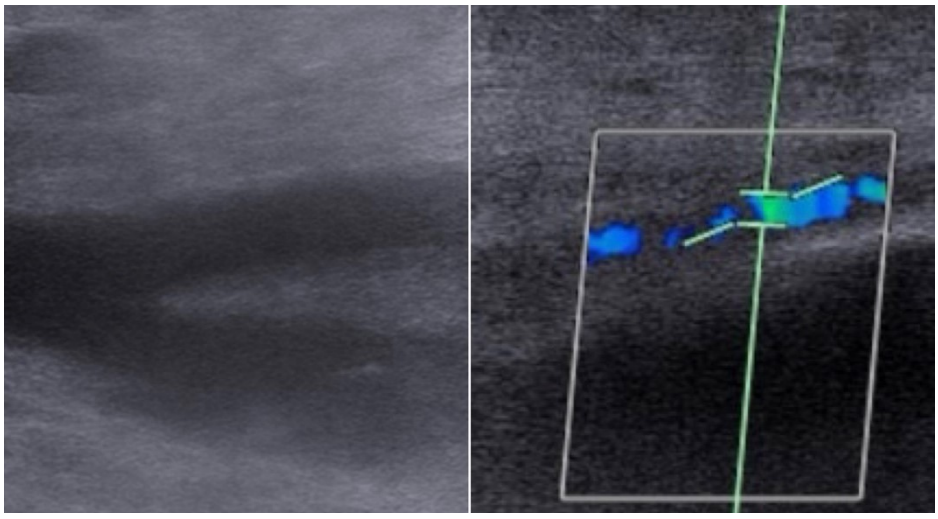
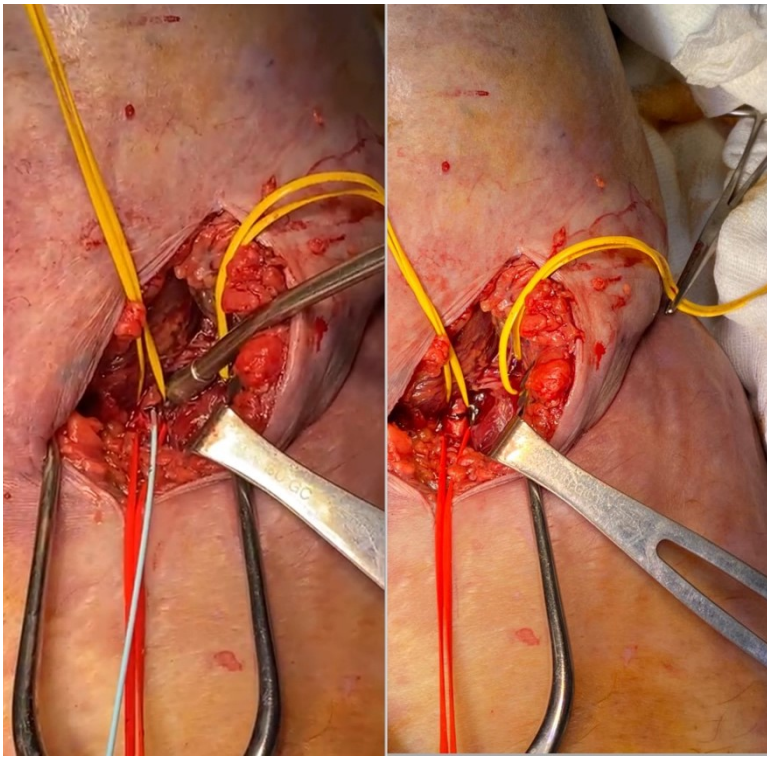


FIGURE 4. Percutaneous Thrombectomy From Popliteal Vein



has involvement in the microvascular collateral veins in addition to the major venous system of the extremity.[1] For this reason, conditions such as venous gangrene, arterial occlusion, and hypovolemic shock are seen in phlegmasia cerulea dolens.[2]

The basic principles of treatment consist of prevention of intravenous coagulation dissemination and further stasis, reduction of venous hypertension, avoidance of hypovolemic shock with fluid resuscitation, prevention of progression to fulminant gangrene, preservation of tissue viability, and treatment of the underlying condition.[1,3]

There are no established algorithms for treatment, and treatment regimens are based on the expertise of the treating clinician. Depending on the clinical condition of the patient, these treatments are leg elevation, medical anticoagulant therapy, intravenous thrombolytics, percutaneous

interventions with thrombolytics, and thromboembolectomy, or a combination of these treatments. In the literature, 10 to 15 U/kg intravenous unfractionated heparin as a bolus is recommended, with adjustment of the dose to 1.5 to 2 times the reference range of activated partial thromboplastin time.[1] Catheter-directed thrombolysis, percutaneous mechanical thrombectomy, or open surgical thrombectomy may be considered in patients with advanced phlegmasia cerulea dolens, venous gangrene, or venous thrombosis resistant to anticoagulation. If venous gangrene develops in the lower extremity, then amputation is required.

Our patient had a diagnosis of phlegmasia cerulea dolens at the time of admission. When widespread venous thrombosis was detected in the left lower extremity during hospitalization and in the right lower extremity 3 days after hospitalization, the patient's legs were elevated, and she was given aspirin 100 mg/day, heparin infusion 15 U/kg, clopidogrel 75 mg, and warfarin 5 mg. It was learned that percutaneous thrombectomy had been performed in consecutive sessions and an inferior vena cava filter had been placed by the cardiovascular surgery team during our patient's previous hospitalization. On day 9 of hospitalization at our hospital, the patient was taken to the operating room due to compartment syndrome in both lower extremities, and surgical thrombectomy and fasciotomy were performed.

Piperacillin/tazobactam (3 doses of 4.5 g each) and teicoplanin 800 mg were started intravenously upon the recommendation of the infectious diseases team, to treat open wounds on the lower extremities at the time of admission to our hospital. The antibiotic therapy was continued throughout her hospitalization. The wounds were dressed after daily irrigation with antiseptic solution.

In patients with phlegmasia cerulea dolens, there is a 40% to 60% risk of venous gangrene, 50% risk of pulmonary embolism, and 10% to 25% risk of amputation. If symptoms progress to venous gangrene, then the risk of amputation is 20% to 50% and the risk of death is 20% to 40%.[4] Despite medical and surgical treatments, our patient died from cardiopulmonary arrest due to extensive thrombosis in the lower extremity veins at the time of admission and the development of venous gangrene and compartment syndrome during hospitalization.

CONCLUSIONS

Phlegmasia cerulea dolens is a rare disease with serious morbidity and mortality. Early diagnosis and treatment are vitally important. As in the case we presented, sometimes patients die as a result of rapid clinical progression and side effects, despite the use of different medical and surgical treatments.

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