

# THE TREATMENT OF DEEP VEIN THROMBOSIS IN ILIOFEMORAL SEGMENT – THE ATHLETICS INJURES

Artur Pupka (A, B, D, E, F), Przemysław P. Szyber (B, D, E, F)

Department of Vascular, General and Transplantological Surgery Wrocław University of Medicine, Wrocław, Poland

## Abstract

**Pupka A, Szyber PP.** The treatment of deep vein thrombosis in iliofemoral segment –the athletics injures. *Med Sport* 2007, 11 (1) 17-19.

**Aim of the study:** In this study the efficacy of thrombolytic treatment of thrombosis of deep veins in iliofemoral segment in athletes was presented.

**Materials and methods:** The study comprised 2 patients (culturists amateurs) that underwent treatment because of venous thrombosis in iliofemoral segment, in the Department of Vascular, General and Transplantological Surgery, who underwent thrombolytic therapy with the application of tissue plasminogen activator – rt-Pa. In both patient antithrombotic drugs and anticoagulants were used in the further treatment.

**Results:** In the booth athletes treated with thrombolysis the full patency of deep veins of iliofemoral segment was achieved. In booth patients thrombotic changes in popliteal-tibial segment maintained, conditioning postoperative symptoms of postthrombotic syndrome.

**Conclusions:** Venous thrombolysis is proper treatment in deep veins thrombosis in iliofemoral segment.

**Key words:** vein thrombosis, phlegmasia cerulea dolens, thrombolysis, athletes

## Introduction

Acute thrombophlebitis of lower extremities is a specific type of venous thrombosis (1-5). The most frequent localization of the disease is lower limbs (1-5). As a consequence of rapidly increasing thrombosis of superficial veins, deep veins and veins of small and large pelvis, venous outflow pathway from a lower extremity gets totally closed. It leads to the development of phlegmasia cerulea dolens of the limb (2-7). The first symptoms of the disease are rapid, acute, stinging pain of the thigh and shank. Simultaneously skin cyanosis is observed associated by rapidly growing edema of the lower limb (2-7). Together with edema increase, hemodynamic disturbances in circulation occur, which in extreme cases lead to oligovolemic shock (2-7).

Extensive venous thrombosis and massive edema of a lower limb are the causes of stopping arterial blood inflow (2-7). Pulse on foot arteries and popliteal artery decreases and in extreme cases. The lack of arterial blood inflow results from a spontaneous arterial contraction and the pressure of transudative fluid entrapped in inextensible fascial compartments on arteries. In the disease process of a longer duration arterial thrombosis develops. A resulting acute ischemia of the limb together with increasing venous thrombosis make the cause of gangrene of peripheral parts of the lower extremity (9-14). Coexistence of hemodynamic disturbances resulting from oligovolemic shock makes the course of blue painful edema of

a lower limb very severe. Death rates gain 30% and in 30-50% cases the limb is amputated (2-7).

Phlegmasia cerulea dolens of a lower limb develops most often on the grounds of venous failure in the course of varicosity, inflammatory foci in the organism or cancer disease (2, 7). More seldom occurring causes of thrombophlebitis of a lower limb are iatrogenic factors (e.g. venous catheterization), and genetically conditioned disturbances of coagulation system (e.g. deficiency in C and S proteins, antithrombin III, antiphospholipid syndrome) (2, 8).

## Materials and methods

In the years 2005-2006 in the Clinic of Vascular, General and Transplantological Surgery, 2 patients - culturists amateurs after the physical effort on bodybuilding gym (aged 19 and 27) were treated due to venous thrombosis in iliofemoral segment. Thrombosis at both culturists appeared a dozen or so hours after exercises of legs (knee bending with the bar). They were diagnosed on the basis of clinical symptoms, Duplex-Doppler examination and venography examination. The examinations were conducted also in the course of treatment (venography) and postoperative observation (Duplex-Doppler).

In this patients massive lower limb edema was found without the characteristics of acute ischemia, but associated by pain. Doppler examinations showed occlusion of the veins of deep system of a lower

extremity and iliac veins. All of the patients were treated with tissue plasminogen activator (rt-PA). Thrombolytic drug was given into the superficial venous system of the upper limb. Thrombolysis lasted from 24 to 72 hours and was under control of venographic examination. The applied dose of rt-PA was 2 mg/hour. After finishing the thrombolytic treatment the patients were administered heparin intravenously (whose administration started during thrombolysis). The therapy was continued using low-molecular heparin or anticoagulants.

### Results

Full potency of venous system of iliofemoral segment was achieved in both patients. In both patients thrombotic changes in popliteal-tibial segment maintained, conditioning postoperative symptoms of post-thrombotic syndrome. Post-thrombotic syndrome switched off both culturists from tilling of sport.

### Discussion

Clinical symptoms in the shape of painful massive edema of a lower limb reaching inguinal ligament, as well as bluish skin color suggest phlebothrombosis in the area of a lower limb and in iliofemoral segment (1-17). Pain within the limb, mobility disturbances and the lack of peripheral pulse suggest coexistence of acute ischemia (2-7). The basic examination in the diagnosis of phlegmasia cerulea dolens is ultrasonography with dual imaging, which shows the lack of flow within deep veins of a lower limb and in iliofemoral venous segment (3). Performance of venography examination using catheter enables application of local thrombolytic therapy and the control of its effects (6,7,9-11,15).

Acute ischemia of a limb developing in the course of deep vein thrombosis determines therapeutical treatment. The treatment of choice is thrombolytic therapy or surgery (1-12,14-17).

Thrombolytic treatment undergoes with the application of streptokinase, or more often using tissue plasminogen activator (rt-Pa) (2,6-11,15). The patients with thrombosis lasting not longer than 1-3 days are qualified for this treatment. During rt-Pa administration fewer hemorrhagic complications and allergic symptoms including anaphylactic shock are observed. The most proper way of thrombolytics application is their administration through a catheter with several side outlets directly into the thrombus, complemented by heparin treatment (6,7,9-11,15). Such mode of thrombolytic drugs administration enables the shortening of their application time and the limitation of a drug quantity. In the case of the remaining after the treatment stenosis in the deep venous system percutaneous angioplasty is performed (PTA) and possible stent implantation (6,7,9-11,15). Always implantation of filters to cava vein should be considered. All of the

patients obtain anticoagulants orally in the further course of treatment.

Surgery is performed in patients in which the disease process does not last longer than 7 days, and in the cases, when the usage of thrombolytic drugs is strictly contraindicated (1-5,8,12,14). Venous thrombectomy operation is performed in intraoperative protection against pulmonary obstruction using Fogarty catheter or temporary filter implanted into the inferior caval vein through the common femoral vein on the healthy side (1,3-5,17). The patient is settled in the reverted Trendelenburg position. Catheter implantation can be unnecessary in the case of a surgery performed in intratracheal general anesthesia with the application of positive end-expiratory pressure, which by increasing the pressure in cava vein prevents pulmonary embolism. The removal of thrombuses from deep veins of a lower limb is performed with the help of pulsating compression from the periphery of the extremity to the groin. Such a way of thrombectomy does not destroy valves of deep venous system. In the case of a recurring pulmonary obstruction, the necessity of filters to cava vein should be considered (2,16). In the further treatment heparin and anticoagulants are used orally. Venous thrombectomy may be complemented by the performance of a temporal arteriovenous fistula between an artery and the common femoral vein (1,8,14). Such fistula requires later closing and thus the necessity of a surgical intervention. An arteriovenous shunt through the fistula may be the cause of the ischemia of the lower limb and right ventricular failure.

### Conclusion

1. The physical effort (bodybuilding) can be at the bottom of pronounced veins thrombosis.
2. Venous thrombolysis is proper treatment in deep veins thrombosis in iliofemoral segment.

### References

1. Lord RS, Chen FC, Devient TJ., et al. Surgical treatment of acute deep venous thrombosis. *Word J Surg* 1990; 14: 694-702.
2. Meissner AJ. Chirurgiczne leczenie zakrzepicy żył głębokich kończyn dolnych. *Terapia* 2002; 4: 27-31.
3. Pupka A, Janczak D, Rybak Z., et al. Leczenie bolesnego błękitnego obrzęku kończyny dolnej. *Mag Med.* 2003; 9: 19-21.
4. Skóra K, Skóra J, Szyber P., et al. Leczenie operacyjne zakrzepicy żylniej w odcinku biodrowo-udowym. 56 Zjazd TChP Lublin 1993; T.2. 440-1.
5. Skóra K, Skóra J, Szyber P., et al. Ostre niedokrwienie kończyn dolnych w przebiegu phlegmasia coerulea dolens. XXIV Zjazd Sekcji Chir. Kl. Piersiowej, Serca i Naczyń TChP Poznań 1992; streszcz. 274.
6. Patel KR, Paidas CN. Phlegmasia cerulea dolens: the role of non-operative therapy. *Cardiovasc Surg* 1993; 1: 518-23.
7. Patel NH, Plorde JJ, Meissner M. Catheter-directed thrombolysis in the treatment of phlegmasia cerulea dolens. *Ann Vasc Surg* 1998; 12: 471-5.

8. Łopaciuk S. Leczenie zakrzepicy żył głębokich kończyn dolnych: heparyna, środki fibrynolityczne czy trombektomia. *Pol Przegl Chir* 1993; 65: 841-3.
9. AbuRahma AF, Perkins SE, Wulu JT., et al. Iliofemoral deep vein thrombosis: Conventional therapy versus lysis and percutaneous transluminal angioplasty and stenting. *Ann Surg* 2001; 233: 752-60.
10. Comerota AJ, Throm RC, Mathias SD., et al. Catheter-directed thrombolysis for iliofemoral deep venous thrombosis improves health-related quality of life. *J Vasc Surg* 2000; 32: 130-7.
11. Comerata AJ, Aldridge SC, Cohen G., et al. A strategy of aggressive regional therapy for acute iliofemoral venous thrombosis with contemporary venous thrombectomy or catheter-direct thrombolysis. *J Vasc Surg* 1994; 20: 244-54.
12. Eklof B, Arfvidsson B, Kistner RL., et al. Indications for surgical treatment of iliofemoral vein thrombosis. *Hematol Oncol Clin North AM* 2000; 14: 471-82.
13. Hill SL, Holtzman GI, Martin D., et al. Selective use of the duplex scan in diagnosis of deep venous thrombosis. *Am J Surg* 1995; 170: 201-5.
14. Juhan C, Alimi Y, Berthelemy P., et al. Late results of iliofemoral venous thrombectomy. *J Vasc Surg* 1997; 25: 417-42.
15. Schweizer J, Kirch W, Koch R., et al. Short- and long-term results after thrombolytic treatment of deep venous thrombosis. *J Am Coll Cardiol*. 2000; 36: 1336-43.
16. Hajduk B, Tomkowski WZ. Wskazania do wprowadzenia filtru do żyły głównej dolnej. *Terapia* 2002; 4: 31-3.
17. Weber H, Loeprecht H. Surgical treatment of deep venous thrombosis: differential indications technic follow-up and results. *Vasa Suppl* 1989; 27: 130-4.

Received: January 22, 2007

Accepted: March 05, 2007

Published: March 27, 2007

**Address for correspondence:**

Dr hab. n. med. Artur Pupka

ul. Poniatowskiego 2

50-326 Wrocław

Tel./fax. 071 7332299

e-mail: apupka@chirn.am.wroc.pl

---

**Author's contribution**

A – Study Design

B – Data Collection

C – Statistical Analysis

D – Data Interpretation

E – Manuscript Preparation

F – Literature Search

G – Funds Collection