

PERCUTANEOUS THROMBOASPIRATION AND CATHETER DIRECTED THROMBOLYSIS IN ACUTE LOWER LIMB ISCHEMIA

CORNEL IOAN BITEA¹, ALEXANDRU-GEORGIAN COSTEA²

¹Clinical County Emergency Hospital Sibiu, ²Clinical County Emergency Hospital Sibiu

Keywords: percutaneous thromboaspiration, catheter directed thrombolysis, transluminal angioplasty, acute lower limb ischemia, atrial fibrillation

Abstract: We report a case of a female patient with paroxysmal atrial fibrillation (CHADS2 score of 5) and acute lower limb ischemia, where we proceeded percutaneous thrombus aspiration, catheter directed thrombolysis and percutaneous transluminal angioplasty, having a very good result. Acute arterial occlusion is a challenge to physicians and early proper diagnosis and treatment is crucial. An interventional cardiovascular treatment avoided leg loss. Follow up revealed normal clinical exam, no symptoms of peripheral artery disease and arteriography showed no significant stenosis. Ankle brachial index of right foot before interventional treatment was 0.3, after percutaneous thrombus aspiration, catheter directed thrombolysis and percutaneous balloon angioplasty being 1.1. The patient was discharged with optimum anticoagulant therapy to prevent further arterial occlusion.

INTRODUCTION

Acute lower limb ischemia occurs when there is an abrupt interruption of blood flow to lower extremity.(1) Atrial Fibrillation is the most prevalent sustained cardiac arrhythmia (2) and emboli from left atrium can cause acute arterial occlusion. According to the guidelines, patients with paroxysmal atrial fibrillation should be anticoagulated if they have a CHADS2 score of one or more to prevent strokes and acute limb ischemia.

Thromboembolism is a severe complication in atrial fibrillation (3) and a common cause of stroke and acute lower limb ischemia. The outcomes of early intervention can lead to limb salvage, whereas late recognition places the patient at risk for limb loss and potential mortality.(4)

CASE REPORT

A 69 year-old female patient was admitted to the Department of Cardiology within the Clinical County Emergency Hospital of Sibiu, having these symptoms: sudden onset severe pain of right lower leg that started 1 day before admission to the Cardiology Department. She also complained of right leg paresthesia and palpitations.

Medical history revealed high blood pressure having a very high cardiovascular risk, paroxysmal atrial fibrillation without anticoagulant therapy, no history of peripheral artery disease, no history of coronary artery disease, but with history of transient ischemic attack.

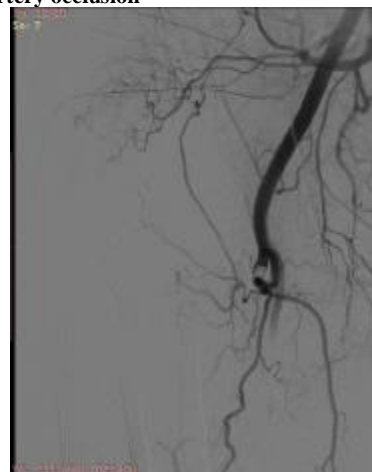
Physical examination: cold skin of right foot, no pulse on right femoral artery, blood pressure was 170/95 mmHg, heart rate 120/min arrhythmic, normal respiratory exam. Chemical panel was in reference scale. Right limb colour Doppler ultrasound revealed right femoral artery occlusion, abnormal popliteal and tibial artery flow.

Ankle brachial index measurement (ABI) on the right ankle was 0.3, after cardiovascular interventional treatment the ABI was 1.1. A complex endovascular technique led to limb salvage. Left ankle ABI was 1.0, with normal clinical and ultrasound exam.

Because the thrombus was located also in distal popliteal and tibial artery, we continued thromboaspiration, thrombolysis with reteplase and balloon angioplasty to the level of distal tibial artery. We consider that the procedure was a success thanks to complex endovascular thromboaspiration and thrombolysis that are an effective treatment for distal emboli, completed by PTA and optimal anticoagulant therapy.

Lower limb arteriography revealed occlusion of the right superficial and profunda femoral artery. The interventional cardiologist started percutaneous thrombus aspiration, balloon angioplasty of right femoral, popliteal and tibial arteries and catheter directed thrombolysis. The thrombolytic used for catheter directed thrombolysis was reteplase. Reteplase is a new thrombolytic agent with a high fibrinolytic activity. Follow up showed normal clinical and ultrasound exam, permeable right arterial axis (angiogram). She was discharged with anticoagulant therapy to avoid further arterial occlusion.

Figure no. 1. Angiogram showing superficial and profunda femoral artery occlusion



¹Corresponding author: Alexandru-Georgian Costea, Bdul. C. Coposu, Nr. 2-4, Sibiu, România, E-mail: costeaalexandrugeorgian@yahoo.com, Phone: +40722 344607

Article received on 20.10.2017 and accepted for publication on 29.11.2017

ACTA MEDICA TRANSILVANICA December 2017;22(4):32-33

CLINICAL ASPECTS

Figure no. 2. Angiogram after thromboaspiration, catheter directed thrombolysis (CDT) and percutaneous transluminal angioplasty (PTA)

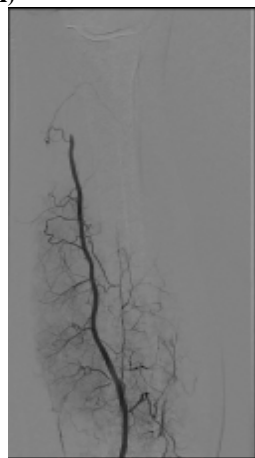


Figure no. 3. Angiogram after thromboaspiration, catheter directed thrombolysis (CDT) and percutaneous transluminal angioplasty (PTA)



DISCUSSIONS

Results of conventional surgery for acute lower limb ischemia remain poor, considering that many patients have also arterial thrombus located in distal popliteal artery or even in distal tibial arteries. Conceptual changes for treatment of acute lower extremities ischemia are brought on by percutaneous endovascular interventions such as percutaneous thromboaspiration and catheter directed thrombolysis. If it is necessary these techniques can be complemented by percutaneous balloon angioplasty (percutaneous transluminal angioplasty-PTA).

A reduction of cardiopulmonary complications and corresponding increase in patient survival rates has been observed after intra arterial thrombolytic therapy.(5)

The study – Thrombolysis or peripheral arterial surgery- concluded that limb salvage and patient survival rates in patients with catheter directed thrombolysis are similar to those achieved with surgery. The catheter directed thrombolysis was applied to patients who had acute lower extremity ischemia for 14 days or fewer. Endovascular or surgery interventions completed successful thrombolysis when arterial lesions responsible for the occlusion were unmasked.(6)

It was proved that reteplase is safe for catheter directed intra thrombus thrombolysis, with no intracranial hemorrhagic events. Catheter directed infusion of reteplase for acute lower limb ischemia is high lower limb salvage rates, low mortality rates and low risk of bleeding in a study from 2000.11 to 2004.02 where reteplase was used to treat arterial occlusion in 81 patients.(7)

Peripheral intra arterial thrombolysis has better limb salvage rates and lower mortality rates than surgery in the treatment acute lower limb ischemia, the study included 1051 surgical cases and 895 peripheral intra arterial thrombolysis cases, assessing benefits and risks of PIAT versus surgery.(8)

All these things being considered, in acute arterial occlusions we recommend percutaneous thromboaspiration; catheter directed thrombolysis and if necessary complemented by percutaneous transluminal angioplasty (PTA).

The usual treatment of acute arterial occlusion used to be surgical technique, but thromboembolectomy with the Fogarty catheter cannot remove arterial thrombus located in distal popliteal and tibial artery and distal emboli may follow the surgical approach so this treatment will fail.

The endovascular treatment can remove thrombus located in popliteal artery or located in the trifurcation. Distal emboli may also follow percutaneous peripheral intervention but fortunately thromboaspiration and catheter directed thrombolysis is an effective treatment for distal emboli.

CONCLUSIONS

Our case illustrates the importance of endovascular treatment such as thromboaspiration, catheter directed thrombolysis and if necessary complemented by additional percutaneous transluminal angioplasty (PTA). We recommend endovascular techniques to be initial intervention in patients presenting with acute arterial occlusion. We consider that this percutaneous peripheral intervention can demonstrate a long term femoral, popliteal and tibial arteries patency, especially when it is complemented by additional balloon angioplasty.

REFERENCES

1. Walker TG. Acute limb ischemia. *Tech Vasc Interv Radiol.* 2009;12:117-129.
2. Saliba W Incidental atrial fibrillation and its management. *Postgrad Med.* 2011;123:27-35.
3. Menke J, Luthje L, Kastrup A, Larsen J. Thromboembolism in atrial fibrillation. *Am J Cardiol.* 2010;105:502-510.
4. O'Connell JB, Quinones-Baldrich WJ. Proper evaluation and management of acute embolic versus thrombotic limb ischemia. *Semin Vasc Surg.* 2009;22:10-16.
5. Ouriel K, Shortell C K, De Weese JA, et al. A comparison of thrombolytic therapy with operative vascularization in the initial treatment of acute peripheral arterial ischemia. *J Vasc Surg.* 1994;19:1021-1070.
6. Ouriel K, Veith FJ, Sasahara AA, for the TOPAS Investigators Thrombolysis or peripheral arterial surgery (TOPAS): phase I results. *J Vasc Surg.* 1996;23:64-75.
7. Hanover TM, Kalbaugh CA, Gray BH, et al. Safety and efficacy of reteplase for the treatment of acute arterial occlusion: complexity of underlying lesion predicts outcome. *Ann Vasc Surg.* 2005;19:817-822.
8. Diffin DC, Kandarpa K. Assessment of peripheral intraarterial thrombolysis versus surgical revascularization in acute lower limb ischemia: a review of limb salvage and mortality statistics. *J Vasc Interv Radiol.* 1996;7:57-63.