



Case report

Successful selective arterial thrombolysis in patient with acute abdominal thromboembolism

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ABSTRACT

The paper reports successful thrombolysis conducted in 64 years old woman admitted to the clinic with clinical and angiographic data for acute surgical abdomen caused by acute thromboembolism of arteria mesenterica superior (AMS). The therapeutic approach required to undertake lifesaving decision on i.e. surgical vs. invasive treatment in conditions of emergency. Finally, it was decided to undertake invasive treatment with successful restoration of blood flow in the related artery. The patient was discharged from the clinic with considerable clinical improvement on the fifth day of her stay. The case report includes discussion on issues relating the consequence of the diagnostic and interventional procedures in such patients, opportunities for conducting emergency thrombolysis in acute embolia of AMS and preventive measures in patients with high thromboembolic risk.

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1. Introduction

Acute mesenteric ischemia remains a diagnostic and therapeutic challenge. Mortality is high and ranges between 50.0 and 97.3%. Angiography is the keystone of the diagnosis and treatment. Early aggressive therapy allows decreasing mortality rate up to about 30%. Various techniques are used to restore the blood flow including selective thrombolysis, angioplasty or bypass surgery or the combination of these techniques. Thrombolysis has been described as a stand-alone treatment for acute occlusion of AMS, with good outcome but is relatively rare. In a recent publication, thrombolysis has been described as a useful adjunct to endovascular embolectomy in order to remove residual clotting.^{1,2}

We present a case of early-diagnosed thromboembolism of AMS successfully treated with invasive treatment approach, selective arterial thrombolysis.

2. Case description

64 years old woman was admitted in the surgical clinic with complains of abdominal pain lasting approximately twelve hours after last meal with sustained attacks and multiple vomiting. She has reported a single defecation in the last twenty-four hours. She has also had palpitation and oppression in the heart region. Past diseases include history of rheumatic heart disease with a considerable mitral stenosis. She has also undergone balloon angioplasty of mitral valve.

Ten days ago she was treated for acute thrombosis of the right arteria poplitea in the vascular surgery ward of other hospital with Enoxiparin 0.6 ml 1 time daily with full resolution of her complaints. Clinical examination established a slightly impaired general status. Skin and visible mucous membranes were pale with moist and slightly coated tongue. Bone and muscle system were properly developed and patient had normal Height 160 cm, Weight 72 kg (Body mass index 28.1 kg/cm²). The lung auscultation revealed vesicular bilateral breathing weakened slightly in the right base. Respiratory rate on admission was 20 per minute. On admission was detected arrhythmia with pulse rate of 96 beats/min and blood pressure 140/80 mmHg. Heart sounds were clearly heard but the second heart sound was accentuated and widely

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splitted. The diastolic mitral valve murmur 3/6 was well auscultated. Abdomen was painful below the chest, respiratory movable, unbloating. The abdominal walls were soft and elastic, allowing deep palpation without peritoneal irritation. The intestinal motility was dull without intestinal gurgling. Rectal Touché revealed empty ampoule.

Electrocardiography (ECG) confirmed atrial fibrillation.

Echocardiography hasn't recognized an intra-cardiac thrombus.

Radiography presented small pleural effusion, notably extended arc of the left ventricle in cardiac configuration corresponding to the mitral stenosis. The X-ray of the abdomen made visible 1–2 hydro-aeric shadows in the small bowel.

Ultrasonography of the abdomen (done on the first hour of hospitalization) revealed visible a part of the bowel loops with thickened hypo echogenic wall with size of 8 mm on the left side of the abdomen, enlarged lymph nodes in the neighborhood. Doppler program does not detect acoustic window. Small amounts of free-flowing liquid in the pelvis were also detected.

The angiography (done on the second hour of admission and exploring the aorta and branches with intravenous application of the contrast) visualized thrombus and mural filling defect in AMS at the level of vena lienalis that is followed by the total occlusion and lack of contrast in it (Fig. 1).

Laboratory investigations: Leukocytes – 28.0/l, prothrombin time (sec.) – 24.7 s; Prothrombin time (%) – 82%; International normalized ration (INR) – 2.14.

Summarizing the clinical, instrumental and laboratory data on the 4th hour after the patient was admitted; it was decided to undertake selective angiography of AMS with conducting intra-arterial thrombolysis.

Catheterization investigation protocol included: body surface area of 1.78 m²; access from the right radial artery; used contrast Ultravist 220 ml, time of investigation of 45 min. Angiography revealed acute thrombosis of AMS. Coronary arteries were without significant stenosis.

The patient was treated with thrombolysis done with 10 mg bolus Alteplase, applied directly in AMS, followed by intra-arterial infusion over 30 min. In the next 1 h and 30 min was done the intravenous infusion of the remaining 50 ml of the thrombolytic.

The sheet was left for conducting a control invasive investigation done three hours after the first. The control investigation established a total lysis of the related thrombus, restored blood flow in the artery with residual mural thrombi (Figs. 2 and 3).

The follow up showed gradual attenuation of the acute abdominal symptoms. The control of coagulation status showed that the prothrombin time was 71%–9.40 s, fibrinogen 3.48 g/l, partial thromboplastin time (aPTT) – 32 s, INR – 1.0.

It is also important to notice that the control laboratory investigations were taken while the patient was treated with Heparin in doses 25,000 E – 50 ml (1.7 ml/h). Control of aPTT was conducted twice daily. The patient was given the first meal on the second day. The intestinal passage and asymptomatic state were detected on the on the third day. On the fifth day control blood parameters reached the normal values and the patient was discharged from the Clinic with prescription for anti aggregation therapy as prevention.

3. Discussion

Acute disorders of mesenteric circulation proceed in three main consecutive stages including ischemia, infarction (necrosis) of the bowel and peritonitis. Only the first stage is reversible. The other two stages are irreversible. Acute mesenteric thromboembolism, the most common manifestation of acute intestinal ischemia is characterized by complete or almost complete stop of the arterial supply towards the intestinal wall. As a consequence of that processes the toxic products of incomplete metabolism are accumulated in the bowel wall. Initially, the toxic products do not enter blood and do not cause toxicity but only in that early stage of the disease, which makes the promptness of the diagnostic and therapeutic measures in patients with thrombosis of AMS crucial.^{3,4}

Early diagnosis is also of great importance for better prognosis.^{5,6} Embolism is the most common cause of the disorders of the mesenteric flow. Embolism of the AMS occurs more frequently than the embolism of lower mesenterial artery due to the sharp angle between the artery and the aorta. The mesenteric artery thromboembolism is generally related to the co-existing heart



Fig. 1. Total occlusion of a. mesenterica sup.

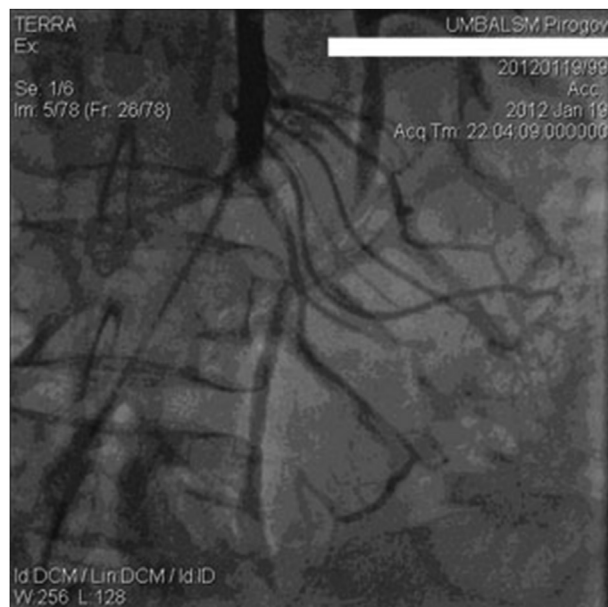


Fig. 2. Initial partial recovery of blood flow at 45 min.

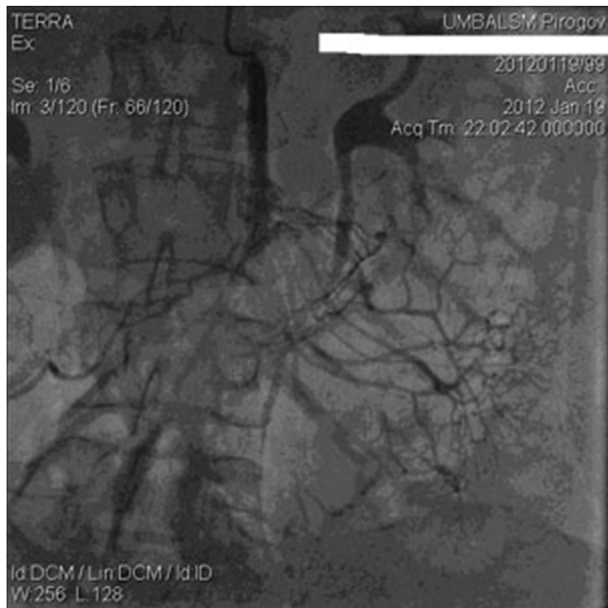


Fig. 3. Recovered blood flow after the third hour.

disease such as endocarditis, rheumatic heart and atherosclerotic diseases of the aortic wall. Sometimes the thromboembolism of AMS could be also caused by “paradoxical embolism” from thrombus of venous origin in patients with congenital diseases with abnormal opening between the left and right chambers of the heart.^{6–8}

Early clinical signs of acute bowel ischemia are not of specific. The main symptom is abdominal ischemic pain. The diagnosis is based on history and clinical presentation, ultrasound, angiography, CAT, Magnetic Resonance Imaging, laparoscopy. The “gold standard” for the diagnosis remains, however, the selective mesenteric angiography. Angiography helps also physicians to specify the type of the disorder, level of occlusion, localization and stage of the disease.^{3,5,6,9}

Until recently surgical methods, resection and/or vascular surgery (embolectomy) in combination with anticoagulant therapy were the main therapeutic approaches. Recently the fibrinolytic (thrombolytic) therapy was introduced as a therapeutic option as well. Reports on the successful early fibrinolytic treatment of acute mesenteric embolism have been known since several years and are sparse so far. There is a technique using very low dose thrombolytic and ultrasonographic waves to break and clean thrombus. The therapeutic benefit of fibrinolysis has been well investigated and experienced in the treatment of the most significant manifestations of thromboembolic disease i.e. coronary, cerebrovascular embolic events as well as other potential areas like deep venous thrombosis and pulmonary edema. According the recommendations in the literature and pharmacological posology, the calculation of the dose regimen has estimated the physical features of the patient and his hematological status.^{8,10} The accepted advantage of the method

is that the thrombolytic agents can be used in different ways – directly, intra-arterial in the mesenteric artery, through the internal jugular vein or through the portal circulation.¹¹

4. Conclusion

The presented case is the first report of successful fibrinolysis of acute thromboembolic occlusion of AMS in Bulgaria and one of the rare such cases in clinical practice, in general. The presented case demonstrates the potential of the method in acute phase although the existing sparse reports on such cases in the literature.¹²

We consider that the good therapeutic result provides a convincing evidence for the potential of pharmaco-angiographic procedures. Factors that define successful outcome include early stage, correct diagnosis and precisely defined therapeutic protocol. The application of pharmaco-angiographic procedures provides the best opportunity for improved survival and prognosis of patients with acute thromboembolism of AMS.

Conflicts of interest

The authors declare that there are no potential conflicts of interest.

Financial disclosure

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