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# SURGICAL TREATMENT OF MULTILEVEL THROMBOSIS OF LOWER LIMB'S ARTERIES

**V. Vassilev[1*], O. Matkov[1], T. Kavrakov[2], H. Abrashev[2]**

[1]MBAL-Burgas INC Burgas city, Burgas, Bulgaria
[2]MBAL "Prof. Dr. Stoqn Kirkovich" INC Stara Zagora city, Stara Zagora, Bulgaria

**ABSTRACT**
Atherosclerosis is a disease, which affects a large number of patients worldwide. Subject of our research are multilevel stenosis and thrombosis, which affect two, three or more segments of the arterial system. Our purpose is to propose a clinical/tactical approach in operative treatment of multilevel thrombosis of the lower limb's arteries.

**Key words:** Atherosclerosis , multilevel trombosis , stenosis , lower limb , by-pass

## INTRODUCTION

Atherosclerosis is a disease, which affects the greatest part of human population. It occurs in early childhood and persists in the whole living time. Thus, we have to say that accumulation of atheromatous plaques in the sub-intimal area of arterial blood vessels, increases with the age and the physiological processes in organism. Whether it is an isolated disease, or it accumulates within the years – this is a problem, which troubles physicians, researchers and patients. After all, we can't deny that patients, suffering from other diseases such as Diabetes, have increased development of atherosclerosis in cerebral, coronary, renal and peripheral arteries of the lower limb. The other risk factors are hypercholesterolemia, obesitas, stress, smoking, arterial hypertension. As the average continuance of life increases, along with irrational nutrition, foods with low quality, professional factors, environmental polution and rising poverty, this problem requires significant measurements in the past decades.

Atherosclerosis develops mostly in two forms – stenosis /obliteration and dilatated form. The first one is the subject of our research. In this form the blood vessel narrows over time, which leads to chronic thrombosis and obliteration. Younger patients may have clinical symptoms, such as acute spontaneous pain, pale of the limb and decreased skin temperature, lack of peripheral pulsations, paresthesia and paralysis. Patients in senile age have developed good collateral circulation and the pain isn't so intensive, but it still occurs, especially in the shanks or it is pain, instigated by the movements. Ischemia has slow exacerbation and some patients feel subjective improvement. Over time muscle contractures may occur. Distal from the thrombosis we have tissue ischemia with complications – necrosis and gangrena. Another feature is that the disease never affects a single blood vessel or a part of it. It is generalized – includes the whole arterial system, but stenosis are not equally expressed. They vary from insignificant to hemodynamicly significant (more than 50% of the lumen) stenosis and full obliterations. We have a special interest in the multilevel stenosis and thrombosis, which affect two, three or more segments of the arterial system. Important for the vascular surgery is the fact that localization of these processes is more often in lower limbs, about 10 times often than upper limbs. Because of that, the correct treatment tactics is highly important. One of the basic questions in Medicine is the rate favor/risk

***Correspondence to**: *Valentin Vassilev, MBAL-Burgas INC Burgas city, "Stefan Stambolov" bul. №73 Burgas 8000, Bulgaria, Email: vailvasilev@mail.bg*

during treatment of any disease. Do the surgery has to be done at once, or in several stages? Whether to affect one single thrombosis, or more than once? These are complicated decisions, which depend on knowledge and experience. It this point, treatment of multilevel stenosis is one of the greatest challenges in Vascular Surgery.

**Purpouse**

The aim of our research is to analyze and propose clinical/tactical approach in operative treatment of multilevel thrombosis of the lower limb's arteries, based on our experience.

***Table 1.***

| sex \ age | 52 – 60 years old | 61 – 70. | 71 – 80 | Over 80 |
|---|---|---|---|---|
| men | 1 | 3 | 5 | 1 |
| women | - | 2 | 4 | 1 |

It shows that patients are mostly common in their senile age, which includes other chronic disease. Chronic heart disease was stated in 15 patients /88,23%/; 4 of them are with Myocardial infarct ; 11 with Diabetes /64,70%/; 4 of them have experienced stroke with pareses/23,52%/; 4 with Chronic renal insufficiency /23,52/. All of the patients suffer from Chronic arterial insufficiency of the limbs, 5 of them have experienced vascular reconstructions in the past. These chronic diseases affected process of treatment in different ways. In three patients were stated contractures, in 5 of them - necroses.

Physical examinations and complete vascular status have been performed, also ABPI, colored duplex-doplersonography before and after the operation and with the discharge of the patients. Nevertheless, arteriography remained the most précised examination /gold standard/ for the level and localization of obturations, proximal and distal negotiability and stage of development for the collateral circulation.

**METHODS**

Subjects of our research are 17 patients, aged from 52 to 85 years old - 7 women and 10 men, treated in Vascular Surgery Department of MBAL Bourgas in period of two years /2012-2013/. All of them have hemodynamicly significant stenosis/thrombosis of at least three basic segments of lower limb's arteries, established with angiography. Treated in the ward patients were stratified by age in **Table 1.**

During the hospitalization, all patients were determined with different stage of ischemia. With 7 of them was made urgent angiography, judjement and operative treatment.

**RESULTS**

All of the patients were operated after the necessary preoperative preparations. We divided the patients into two groups:

In the first group were 5 people /29,41%/ with critical ischemia during the hospitalization and with hemodynamicly significant stenosis of ileo-femoral segment , full obliteration of arteria femoralis superficialis with absolutely passable arteries under the knee. Three of them had successfully done TEA of a.iliaca externa.After obtaining a satisfactory blood flow, it was made TEA of a.profunda femoris and patch-plastic. In 2 of the patients was performed an ileo-femoral by-pass, leading to a.profunda femoris, after successfully performed TEA of this artery with good out-flow. In postoperative period, three of the patients did not overcome the critical ischemia, although applied high doses of Prostavasin. This provoked a reoperation in 3-4 days – revision of sub-knee area, but they

remained unconstructable. In next stage were made amputations through the step /2 patients/ and amputation of shank /1 patient/.

In the second group of 12 patients /70,59%/ were made operations with different complexity, depending on stage and level of stenosis and thrombosis. Our key tactical approach was to determine a reconstrutable popliteal or under-knee segment: Passability /checked with Fogharty's catheter before and after TEA/; Satisfactory out-flow; Presence of good in-flow. With all these done, we made decisions about localization and volume of the operative intervation in the proximal segments. It is pointless to expand the operation if the peripheral segment is missing. If done, it will bring "a blood overcome", which leads to inevitable thrombosis in the early postoperative period. After all we made the following combinations of operations: Aorto-femoro-popliteal by-pass with jump to a.profunda femoris /1 patient/; Femoro-popliteal by-pass with TEA of a.iliaca in proximal and a.poplitea in distal way /4 patients/; Autovenous femoro-popliteal by-pass with TEA of a.iliaca and distal anastomosis under the knee /2 patients/; Femoro-popliteal by-pass with TEA of a.iliaca and revision of under-knee segment with TEA of truncus tibio-peronealis and patch-plastic with autovena /2 patients/ ; Ileo-femoral by-pass with TEA and patch-plastic of a.poplitea in its proximal third – 1 patient /in this case because of thrombosis of a.poplitea in the first 24 hours after the operation and development of critical ischemia of the limb ,it was made a reoperation – prologation of the by-pass with autovena to a.poplitea in the under-knee segment/; Femoro-popliteal by-pass with TEA of a.iliaca and balloon dilatation with stenting of under-knee's arteries in Cardiocenter "Pontica" /2 patients/. The last operation belongs to so called mixed operations.

In the postoperative period, all of the patients were treated with antibiotics, therapeutic doses of direct anticoagulants, vasodilatators, infusions of reologic solutions, etc. Except the described reoperations, two more were done – thromectomies of by-pass. The first one – within 24 hours from the operation , and the second one – on third postoperative day. In later stage, three of the patients were thrifty amputated through the foot.

## CONCLUSIONS

Surgical treatment of multilevel thrombosis is one of the most serious challenges in vascular reconstructive surgery. It is a test even for the most experienced vascular specialists. Even the best operation is doomed, if it is not tactically determined. Key tactical approach is to establish whether the popliteal or sub-knee segment is reconstructable. We must not forget the developed collateral circulation in the distal segments in cases with chronic thrombosis to establish possible unrecostructability. Combination of prosthesis, autovenous or composite by-pass; thrombendarterictomies, profundoplastics, patch-plastics, balloon dilatations and stentings are the instruments of the experienced surgeon to resolve the problem. Without operations, all these patients are fated to high leg amputation and a permanent disability. Treatment of such patients is prolonged and expensive and our future efforts should be pointed in increasing the effect of treatment and to shorten the time of hospitalization.