



The nearest and one-month effects of endovascular revascularization for patients with critical limb ischemia

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Introduction:

The method of endovascular revascularization has a number of key advantages in the treatment of critical lower limb ischemia in comparison with other methods alongside.

However, the drawbacks remain that affect the pace and quality of achieving technical and clinical success in percutaneous transluminal angioplasty.

It should be noted that the relevant results obtained in this study will be used to guide the development of personalized revascularization tactics.

Aim:

To evaluate the effectiveness of endovascular revascularization in patients with chronic lower limb ischemia after percutaneous transluminal balloon angioplasty.

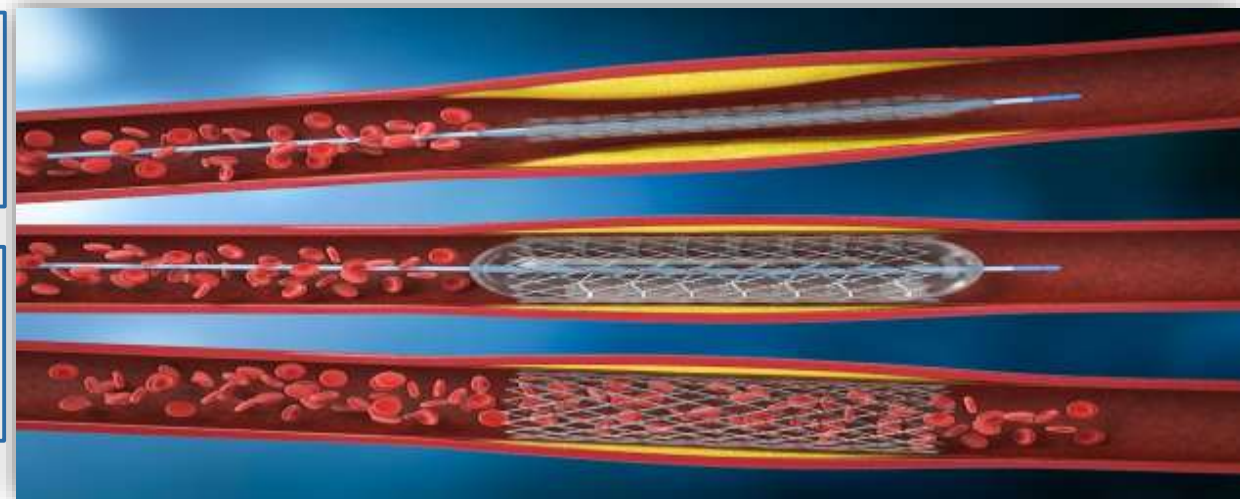


TABLE 1. CLINICAL CHARACTERISTICS OF PATIENTS (N=19)

Materials and methods:

- According to examination results (ultrasound and peripheral angiography), all patients revealed occlusion or significant stenosis of the superficial femoral artery (SFA), popliteal artery (PA), posterior and anterior tibial arteries (PTA and ATA)*.
- More than 47% (n=9) of cases had multilevel lesions of the femoral-popliteal and popliteal-tibial segments.
- All 19 patients were diagnosed with both isolated hemodynamically significant arterial stenoses - 11 (57.8%), and multiple - 8 (42.1%). Level of isolated lesions: EIA – 2 (10,5%), SFA -3 (15.79%); PA - 1 (5.26%); PTA and ATA - 5 (26.3%)*.
- Multiple lesions included EIA+CFA – 4 (21,05%), TPT+PTA+ATA – 2 (10,53%), EIA+CFA+SFA – 2 (10,5%)*. The transcutaneous oxymetry (TcPO₂) was performed before X-ray endovascular revascularization, after surgery on day 1, and also after 1 month.

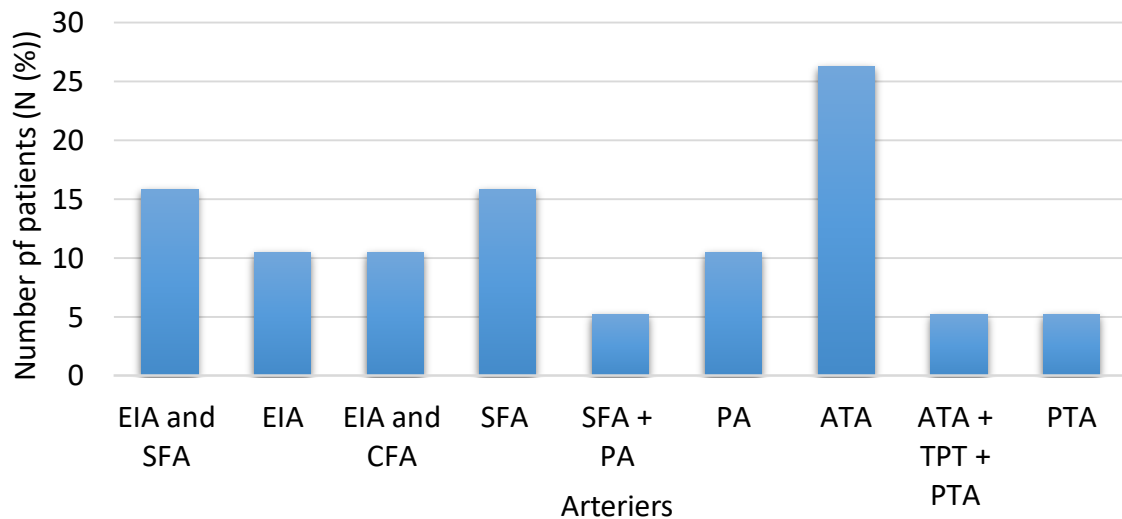
Characteristics	n	%
Male	14	73,68
Female	5	26,32
CLI manifestations:		
- Foot ulcer	11	57,89
- Pain in rest	8	42,10
- Amputation before operation	4	21,05
Comorbidities:		
- Coronary artery disease	5	26,31
- Arterial hypertension	19	100
- Renal insufficiency	9	47,37
- C2 (GFR< 60 mL/min/1.73 m ²)	4	21,05
- C3a (GFR< 45 mL/min/1.73 m ²)	5	26,32
Type 1 diabetes	2	10,53
Type 2 diabetes	11	57,89

*EIA – external iliac artery
CFA - common femoral artery
SFA – superficial femoral artery

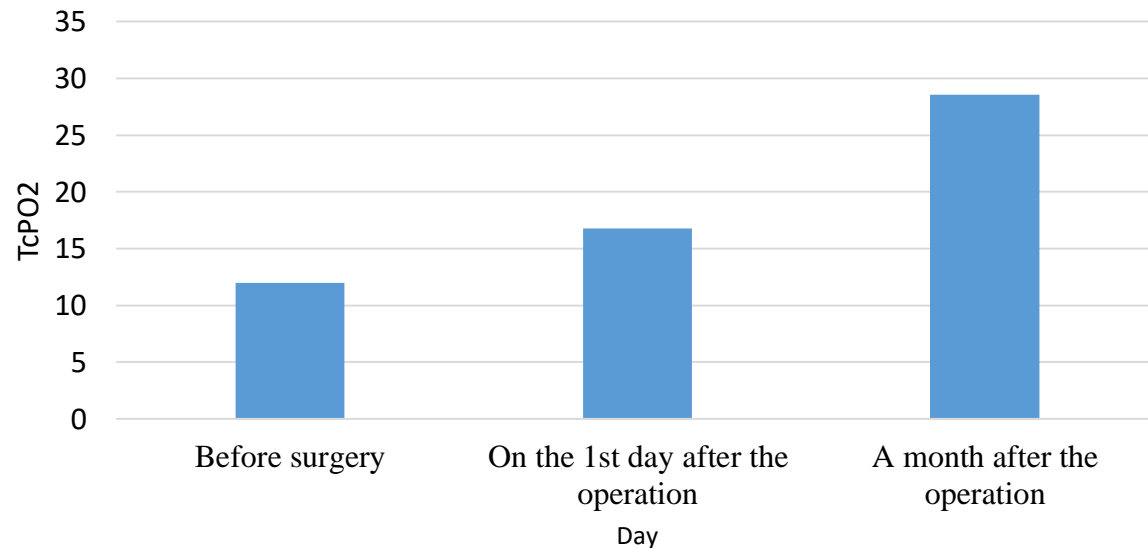
PA - popliteal artery
TPT - tibioperoneal trunk
ATA - anterior tibial artery
PTA - posterior tibial artery



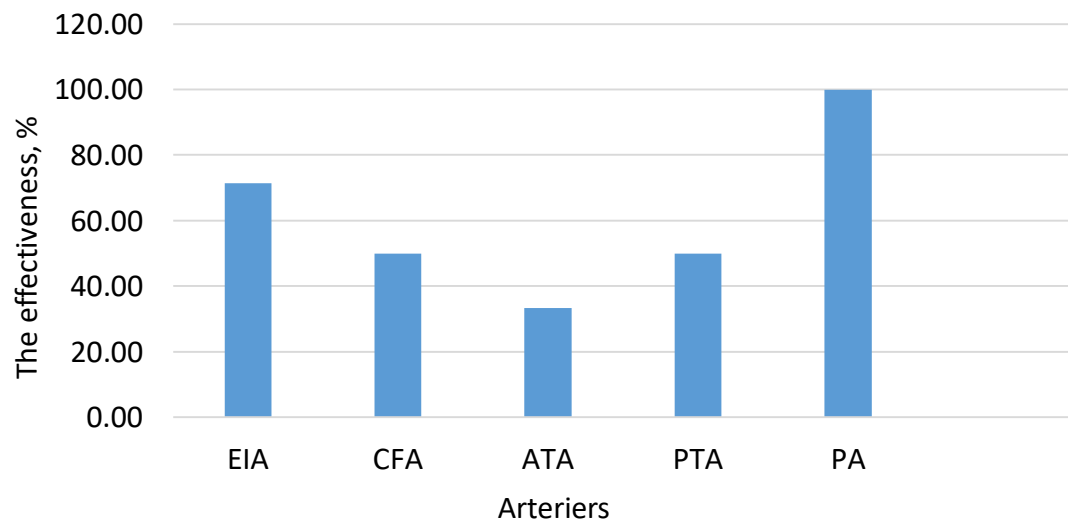
Artery that underwent endovascular revascularization



The severity of ischemia



The effectiveness of endovascular revascularization



It should be noted that a month after the operation, there was a warming of the skin of the lower limb, a decrease in the intensity of pain at rest in more than half of the cases.

The efficiency of endovascular revascularization in the iliac-femoral segment is higher than in the tibia-foot segment. This can be explained by the fact that the lesion of the tibia-foot segment is more typical for patients suffering of concomitant diabetes mellitus.



Conclusion:

- The increase in the transcutaneous partial pressure of oxygen (TcPO₂) the next day after surgery occurs due to dilatation of the stenotic segment, while the increase in tension occurring in a month after surgery is well correlated with a clinical picture of the disease, namely, with symptoms such as decrease in the pain intensity at night as well as warming of the skin of the operated limb.
- According to the ultrasound test conducted before and after surgery, there is a greater degree of the iliofemoral segment dilatation on compared to the popliteal-tibia segment. Such difference occurs due to small dimension of target arteries and concomitant diabetes mellitus suffered by the patients, which predominantly affects smaller vessels.
- It should be noted that 4 patients underwent minor amputation with necrectomy as the first stage to save the limb. The indication for its implementation was wet gangrene or purulent inflammation. The second stage was endovascular revascularization. Otherwise, the risk of progression of ischemia and the development of necrosis is high.