Прилози, Одд. биол. мед. науки, МАНУ, XXX, 1, с. 105–118 (2009)
Contributions, Sec. Biol. Med. Sci., MASA, XXX, 1, p. 105–118 (2009)
ISSN 0351–3254
УДК: 616.137.83/.86-007.272-089.844

# FEMOROPOPLITEAL BYPASS *VS* PERCUTANEOUS TRANSLUMINAL ANGIOPLASTY AND STENTING IN TREATMENT OF PERIPHERAL ARTERY DISEASES OF INFRAINQUINAL SEGMENT – SHORT-TERM RESULTS

**Cvetanovski M. V.,[1] Jovev S.,[1] Cvetanovska M.,[2] Blaževski B.,[3] Čolančeski R.,[1] Andreevska T.,[1] Gramatnikovski N.,[1] Kartalov A.[4]**

*[1]University Thoracic and Vascular Surgery Clinic, Skopje, R. Macedonia*
*[2] University Clinic for Infective Disease, Skopje, R. Macedonia*
*[3] University Clinic for Neurosugery, Skopje, R. Macedonia*
*[4] University Clinic for Anestesiology and Reanimation, Skopje, R. Macedonia*

A b s t r a c t: Critical limb ischaemia is a result of occlusive arterial disease in the infrainquinal segment and is a major indication for arterial revascularization, which implies a femoropopliteal bypass procedure or an interventional procedure – stent grafting of the occluded segment. Although indications for both techniques are clearly defined, there are still controversies. Thus, the aim of this study was to determine short-term results in patients treated with these two treatment modalities.

In the period between 2002 and 2008 a total of 70 patients with occlusive arterial diseases of the low extremity were analysed. In 50 out of 70 patients a femoropopliteal bypass was made. Of these, in 30 (60%) patients PTFE material was used and in 20 (40%) patients an autologous saphenous vein graft was used. The other group comprised 20 patients who underwent stenting. In patients treated with surgical revascularization, the major indication for surgery was occlusive arterial disease in: stage II – in 10 patients (20%), stage III – in 5 patients (10%), stage IV – in 25 patients (50%) and the remaining 10 patients (20%) had subacute ischaemia. Arteriography showed three crural patent tributaries in 18% of the patients, two patent crural tributaries in 40% of the patients and one crural patent tributary in 32% of the patients. There were no significant differences concerning indications and arteriographic findings between the two subgroups. The follow-up period lasted for 6 months and the patency rate was 85% (17) for venous bypass, 11 (64.6%) – short-segment lesions (< 4 cm) and 6 (35.3%) longer segment lesions (> 4 cm) versus 76.5% (23) for PTFE graft ($p < 0.05$), of which 13 (56.5%) were short-segment (<4 cm) and 10 (43.5%) longer segment lesions (> 4 cm).

The following results were obtained for the second group of patients: initially successful stents in 85%; failure in 15% or 2 patients; technical failure in 1 patient or 5%. After 6 months the patency rate was 75% (15), of which 11 patients (73.2%) had short-segment occlusions (< 4 cm) whereas 4 patients (26,8%) had lesions > 4 cm.

The baseline value of the lower limb index (ABI – ankle-brachial index) was significantly increased in both groups, from 0.41 to 0.91 in the group with surgical revascularization and from 0.47 to 0.88 in the second group treated with stenting. The same trend was observed after six months.

This study demonstrated a small but significant difference (85% vs 75%, $p < 0.05$) in favour of the autologous saphenous vein, which should be a preferred graft material in all cases for reconstruction of the femoropopliteal segment. When compared to the overall patency rate of PTFE grafts after 6 months there was no significant difference in patency in the group treated with stent grafting (76.5% vs 75%). However, stenting is a method of choice in the treatment of short-segment occlusions – smaller than 4 cm with good early run off (73.2% vs 64.6%, $p > 0.05$ p = ns). It is obvious that the results are identical to those in treatment with an autologous great saphenous vein, but in comparison with PTFE the results imply stent usage (73.2% vs 56.5%, $p < 0.005$). Prosthesis (PTFE) is a graft material of choice when the great saphenous vein is used, damaged or calcified and when the occlusion is longer than 4 cm and is not suitable for stent grafting (43.5% vs 26.6%, $p < 0.001$).

**Key words:** peripheral artery disease, femoropopliteal bypass, percutaneous transluminal stent angioplasty.

## *Introduction*

Since Dotter and Judkins [1] published their first experiences and results in 1964, percutaneous transluminal angioplasty and stenting (PTAS) have become frequently used techniques for dilatation and recanalization of obstructions in arteries of the lower extremities in patients suffering from peripheral artery disease (PAD). The results of this invasive procedure have been presented in many studies as revolutionary ones, but only a few studies have compared this procedure with the standard surgical procedure for treatment of PAD in the infrainquinal segment – a femoropopliteal bypass. In our study, we wanted to present our opinion and figures that express safety, feasibility and efficacy as well as short-term results in coherent groups of patients at the same stage of peripheral artery disease.

## *Aims of the study*

- To determine the patency rate of femoropopliteal bypass in prosthetic and biological grafts and to compare them;

- To determine the rate of restenosis and reocclusion in patients treated with interventional procedures (PTAS);
- To determine the influence of diabetes mellitus on the patency rate in patients treated with surgical revascularization (biological and prosthetic graft) and in patients treated with interventional procedures (PTAS) and to determine which method is more efficient in the treatment of PAD in diabetic patients;
- To compare the results obtained in patients treated with a surgical method and those treated with an interventional procedure, and based on the results to define the preferred indication areas for both treatment modalities of PAD.

## *Material and Methods*

A total of 70 patients with peripheral artery disease (PAD) in the infra-inquinal segment were statistically analysed in this prospective non-randomized study. Patients were treated at the University Thoracovascular Surgery Clinic in Skopje and at the University Radiology Institute in Skopje. All patients with peripheral artery disease in the infrainquinal segment were analysed according to the inspections of a vascular surgeon and an interventional radiologist. The following were the inclusion criteria of patients in this study:

- Angiographic confirmation of occlusion of superficial femoral artery or popliteal artery not longer than 10 cm;
- Ankle-brachial systolic pressure index of the affected leg < 0.80 at rest;
- The patient had to present at least one of the three symptoms during clinical examination: 1. claudication over a distance of less than 50 metres, which limited his normal everyday activities, 2. rest pain in the affected leg, 3. gangrene – obvious necrosis of the extremity [2].

Exclusion criteria were:

- Contraindications for heparin use or anti-aggregation therapy;
- Medical contraindication for surgical intervention;
- Life expectancy less than 6 months;
- If the patient did not want to be included in the study.

All procedures were considered to be initially unsuccessful if:

- The procedure ended with a lethal outcome or a patient died during his stay in the hospital;
- The procedure ended with amputation (above-knee, below-knee or foot);

- The surgery on the same leg had to be repeated;
- The ABI index returned to the same value as before surgery or to ± 0.20 from baseline value.

Patients were divided into two groups depending on the treatment method of PAD as follows: the first group included 50 patients who underwent surgical revascularization – femoropopliteal bypass. Synthetic material PTFE was used in 30 patients whereas autologous great saphenous vein was used in 20 patients. The surgical intervention was performed by two vascular surgeons. In the postoperative period patients were given a combined therapy of Aspirin 100 mg, Clopidrogel 75 mg and Statins 20 mg.

The second group comprised 20 patients treated with interventional procedure for dilatation and stenting. All of the 20 patients were treated for the existence of atherosclerotic lesions of the femoropopliteal segment. Their age ranged between 41 and 75 years; mean age 58 years.

All PTAS procedures were performed by the same team of radiologists – Dr Damjanovski and Dr Mihajlovski. The decision for PTAS treatment was taken on the basis of the symptoms presented by the patients together with the haemodynamic findings (expressed through the ankle-brachial index) and conducted angiographies (i.e. DSA or Seldinger).

All PTAS therapies were done with a balloon catheter, followed by stenting. As soon as the intervention was completed, in all 20 patients as well as in those from the first group, therapy with Aspirin 100 mg/daily, Clopidrogel 75 mg/daily and Statin 20 mg/daily was initiated for a duration of at least 6 months.

Follow-up controls were done every 6 months during the first year after surgery and they consisted of taking an anamnesis, clinical examinations and determination of the ankle-brachial index.

Angiographies for the purpose of the follow-up were done only in cases of clear recurrent symptoms or in cases where changes of the measured ankle-brachial indices clearly pointed to re-stenosis or occlusion of the already treated arterial lesions.

For a statistical analysis of the data obtained in the investigation, a database was created in Statistica for Windows 7.0 statistical program at the Institute of Epidemiology and Biostatistics, University Medical School, Skopje.

At the end of the control period, open arteries were registered as well as those with re-occlusion or re-stenosis of dilated arteries in order to examine the factors that influenced the short-term outcome of both techniques.

We tried to evaluate the successfulness of both techniques by analysing the initial results, analysing the performed angiographies immediately after the conducted procedure. Our criteria for an initially successful procedure included:

a normalized ankle-brachial index after surgery, restored distal pulsations and improvement of symptoms characteristic of peripheral artery disease.

We considered the PTAS technique a failure if, on angiography, there was no intraluminal route distal from the stent placed or if occlusion recurred during the intrahospital period.

In patients with poor artery runoff, PTAS was considered to be successful if after surgery a subjective improvement of symptoms was registered, if the ankle-brachial index was increased and if pulsations of the popliteal artery were restored.

In evaluating the 6-month follow-up, we considered the PTAS technique to be a failure if the patient's symptoms returned, if distal pulsation of *a.dorsalis pedis* were absent and if after surgery the ankle-brachial index returned to the values prior to the performed procedure. In these cases, we confirmed the disease recurrence by performing angiographies (i.v. DSA). When reintervention was indicated, we considered it as a new procedure.

Then we evaluated the 6-month results to see which factors influence the duration of blood vessel patency.

We correlated morphological characteristics of the results obtained in the 6-month period and compared the procedure outcome with the recurrence percentage rate at the end of the study.

## *Results*

A total of 70 patients were analysed in this study. Their age ranged from 41 to 75 years. There was no significant age difference between the two groups. Major indication for surgery in the surgical group was: stage II – in 10 patients (20%), stage III – in 5 patients (10%), stage IV– in 25 patients (50%) and the remaining patients had subacute ischaemia – 10 patients (20%). In the group of patients where stents were placed, 4 patients (20%) were in stage 2, 3 patients (15%) were in stage 3 and the remaining 13 patients (65%) had subacute ischaemia and patients with trophic gangrenous changes of the extremity. Concerning comorbidity, 21 patients (42%) of the first group had insulin-dependent diabetes as against 12 patients (24%) in the second group ($p < 0.001$). Arteriography showed three crural patent tributaries in 18% of the patients, two crural patent tributaries in 40% of the patients and one crural patent tributary in 32% of the surgical group of patients versus 20%, 40% and 30%, respectively in the group of patients with stent grafting ($p > 0.05$ p = ns). the ength of the occluded segment in the surgical revascularization group varied from 3 to 10 cm, whereas in the group treated with the PTAS method it varied from 2 to 10 cm, pointing to coherence of both groups with reference to this variable ($p > 0.05$ p = ns). Preoperatively, the ankle-brachial index was 0.41 in the first group

versus 0.47 in the second group, and postoperatively it increased to 0.91, that is, 0.88, respectively (p > 0.05 p = ns) (Figure 1).

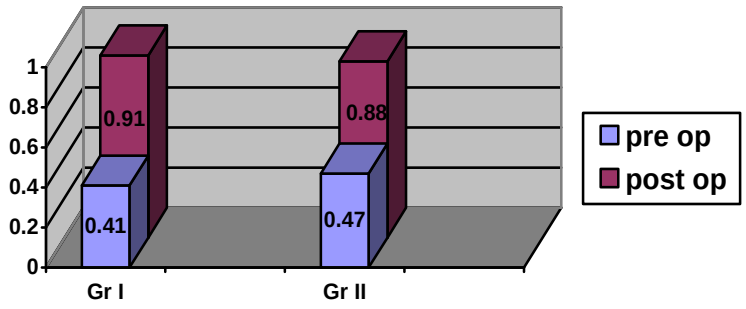


*Figure 1 – ABI (Ankle-brachial index) preoperatively and postoperatively Group 1 (0.41 vs 0.91; p < 0.001), Group 2 (0.47 vs 0.88; p < 0.001) There was no significant difference between the two groups (p > 0.05 p = ns)*

*Слика 1 – АБИ (Ankle-brachial index) предоперативно и постоперативно, група 1( 0,41 vs 0,91 p < 0,001); група 2 (0,47 vs 0,88 p < 0,001). Помеѓу двете групи немаше сигнификантна разлика (p > 0.05 p = ns)*

The follow-up period was 6 months when the primary short-term results of this study were analysed. The overall patency rate in the surgical revascularization group was 85% (17) for venous bypass, 11 (64.6%) for short-segment lesions (< 4 cm) and 6 (35.3%) for longer segments (> 4 cm) versus 76.5 (23) for PTFE graft (p < 0.05), of which 13 (56.5%) were short-segment lesions (< 4 cm) and 10 (43.5%) longer segments (> 4 cm) in the subgroup where PTFE graft was used, revealing a significantly better result (p < 0.05) in favor of the great saphenous vein (Figures 2, 3).

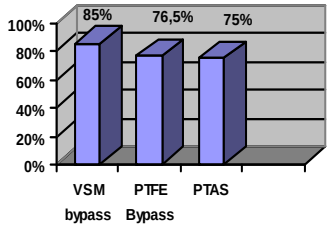


*Figure 2 – Overall patency rate after 6 months; VSM 85% vs PTFE 76.5% vs PTAS 75%*

*Слика 2 – Вкупна проодност по 6 месеци VSM 85% vs PTFE 76,5% vs PTAS 75%*

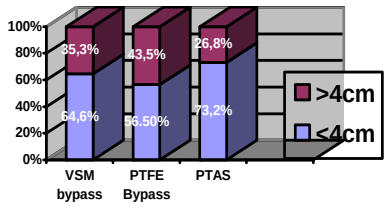


*Figure 3 – Overall patency in short lesions (< 4 cm) and longer (> 4 cm)*

*Слика 3 – Вкупна проодност кај кратки лезии (< 4 cm) и долги лезии (> 4 cm)*

In the first surgical revascularization subgroup treated with a great saphenous vein graft, of 11 patients with short-segment lesions and 6 patients with longer segment lesions with patent graft 8 (72.7%), that is, 5 (83.3%) patients had insulin-dependent *diabetes mellitus*. On the other hand, in the subgroup treated with PTFE revascularization, of 13 patients with short-segment lesion and 10 patients with longer segment lesions 3 (23%), that is, 2 (20%) patients were registered with insulin-dependent *diabetes mellitus*. When the two subgroups of the first group were analysed in relation to comorbidity of *diabetes mellitus*, it was detected that in the subgroup treated with autologous great saphenous vein graft 14 (70%) of 20 patients had *diabetes mellitus* and 13 (92.8%) had a patent bypass after 6 months versus the subgroup of patients treated with prosthetic (PTFE) material, of whom 7 (23.3%) of 30 patients had *diabetes mellitus* and 5 (71.4%) had a patent bypass after 6 months. This clearly indicates that in spite of the significantly higher percentage of *diabetes mellitus* (70%) the first subgroup had a significantly higher patency rate at the three-month check-up in comparison with the second subgroup (92.8% vs 71.4%) ($p < 0.01$) (Figure 4).

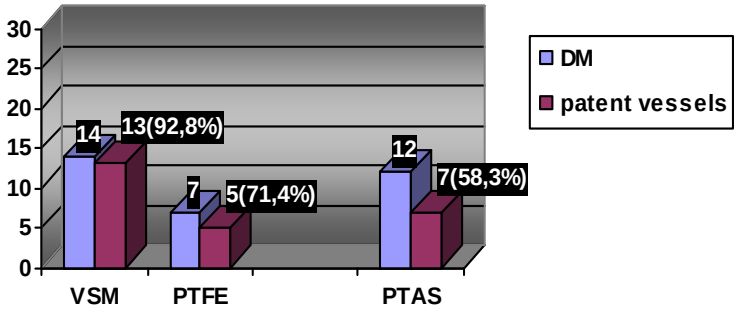


*Figure 4 – Relation between insulin-dependent diabetes mellitus and patency rate in both groups. Superiority of large saphenous vein is obvious. (92.8% vs 71.4%; $p < 0.01$) (92.8% vs 58.3%; $p < 0.001$) (71.4% vs 58.3%; $p < 0.05$)*
*Слика 4 – Сооднос на инсулинозависен дијабет и проодноста во двете групи. Се гледа супериорност на големата сафенска вена (92,8% vs 71,4% p < 0,01) (92,8% vs 58,3% p < 0,001) (71,4% vs 58,3% p < 0,05)*

The results obtained in the second group were as follows: the percentage of initially successful stenting was 85. It failed in 2 patients (15%). It was technically unsuccessful in 1 patient, or 5%. Patency after 6 months was 75% [15], of whom 11 patients (73.2%) had short-segment occlusions (< 4 cm) while 4 patients (26.8%) had lesions > 4 cm. 25% of patients had a confirmed occluded stent at the control after 3 months and they were all diagnosed with insulin-dependent *diabetes mellitus* and verified longer segment (> 4 cm) occlusion. Out of the 20 patients in the second group 12, or 60%, were diabetics with

insulin-dependent *diabetes mellitus* and in only 7 patients (58.3%) was the stent patent at the control after 3 months. When this was compared with the first group (92.8% *vs* 58.3%; $p < 0.001$) (71.4% *vs* 58.3%; $p < 0.05$) it unambiguously proved the inferiority of stenting versus surgical revascularization as a technique (Figure 4).

Concerning complications, one patient (2%) in the first group died during the three-month period. The cause of death was acute heart failure and acute renal insufficiency in the postoperative period. There were no lethal outcomes in the second group, but in spite of this variable, there were no significant differences between the two groups. The same refers to all the other analysed complications (amputations, haematomas and vasospasm, which were found in 4%, 4%, 2%, respectively in the first group versus the second group, where these complications were presented in 5%, 5%, 5%, respectively; ($p > 0.05$ p = ns) (Figure 5).

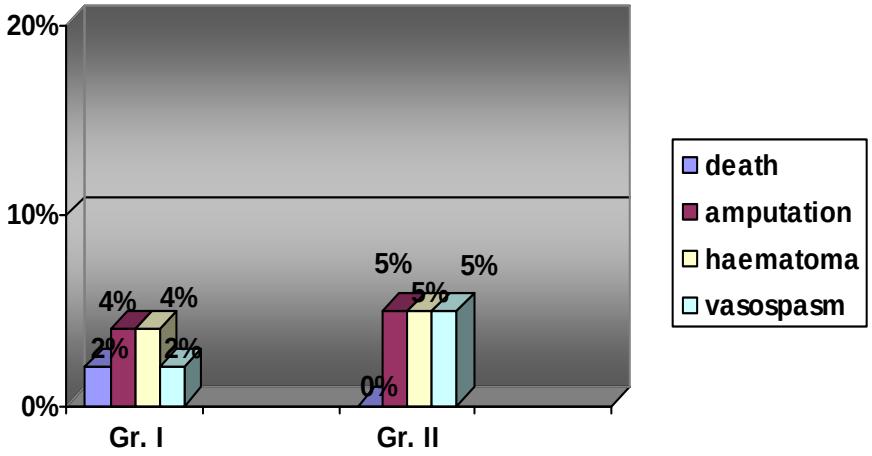


*Figure 5 – Percentage of complications in the two groups.*
*No significant difference ($p > 0.05$, p = ns)*
*Слика 5 – Процентна застапеност на компликациите во двете групи.*
*Нема сигнификантна разлика меѓу групите ($p > 0.05$, p = ns)*

## *Discussion*

The number of studies that have analysed and compared patients treated with stents and surgical reconstruction is very small, especially those analysing long-term results. If we add to this the bias in evaluating the lesions, the current attitude to the treatment of peripheral artery disease is apparent, by which the early less complex and short lesions are to be treated by stenting whereas the

multisegment and complex lesions are to be treated by surgical revascularization. Randomization is one of the factors that enables an equal approach to both modalities of treatment and early evaluation and comparison of results. In our study, by including a fairly coherent group of patients and by independent assessments of an interventional radiologist and a vascular surgeon we tried to apply one of the two compared techniques in order to be objective and to attain more realistic results.

Both groups in our study were comparable with regard to indications, including 20% of patients treated with surgical revascularization *vs* 20% treated with PTAS with *claudicatio intermittens* being a predominant symptom, whereas 70% in the first group *vs* 65% in the second group were in stage 4 and had subacute ischemia, which showed no significant differences between the two groups. However, the results obtained in the series of Wilson *et al*. (2) showed that 184 of 255 analysed patients (72.2%) had the prevalent symptom *claudicatio intermitens* (stage II). This speaks in favour of the hypothesis that indicative areas are quite dilated and that the groups of patients analysed in our study were at a more severe clinical stage in comparison with the group analysed 20 years ago by Wilson *et al*.

Although there was no significant difference between the groups concerning the lower limb tributaries and influence of runoff, patency at 6 months in patients with poor runoff was significantly better in the group of surgical revascularization (60%) *vs* 20% in the group with stenting ($p < 0.001$). These results are in agreement with the results in a large number of studies, such as the study of Martin *et al*., where patency in patients with poor runoff was 65% *vs* 25% [3].

The baseline value of the lower limb index (ABI index) as a physiological indicator of the severity of the disease was increased by more than 50% in patients with claudication while it was doubled in patients with rest pain. No significant difference was detected between the two groups.

The overall patency rate in the first group was 80% as opposed to 75% in the second group of patients with stents ($p > 0.05$ p = ns) and these figures correlate with many studies worldwide where the patency rate ranges from 70 to 92% [12, 13], although these studies included and analysed patients with artery stenosis and not with occlusions alone [4]. the patency rate in the first subgroup was significantly higher in patients where an autologous great saphenous vein graft was used (85%) *vs* 76.5% in the subgroup of patients with PTFE graft ($p < 0.05$). There are polemics as to the initially unsuccessful procedure that happens exclusively in patients treated with stenting and mainly implies technical failure of the procedure, that is, lesions could not be crossed with a catheter or dilated. In our study 15% of patients had an initially unsuccessful procedure and this figure is comparable with figures presented in a large number of studies where

initial failure ranged from 24% to 7.5% [5, 6]. Six-month analysis of the length of lesion showed the superiority of the group with stenting and the subgroup treated with autologous great saphenous vein for short-segment lesions (< 4 cm) with a patency percentage of 73.2 and 64.6% *vs* 56.5% ($p < 0.05$) in the subgroup treated with PTFE. On the other hand, long-segment lesions (4 > 4 cm) had higher patency at 6 months in the surgical revascularization group (35.3% and 43.5%) *vs* 26.8% in the group with stenting ($p < 0.05$). These results speak explicitly in favour of the great saphenous vein as a universally successful graft for both long and short lesions. Stenting is successful and comparable for short lesions and it should be used for long lesions if the great saphenous vein is absent or is of poor quality.

In our study we analysed the most common comorbidity factor – *diabetes mellitus*. the distribution of this risk factor in the first group was 42% (70% in the subgroup with great saphenous vein and 23.3% in the PTFE subgroup) *vs* 60% in the group with stenting. Despite this uneven distribution the subgroup of patients treated with great saphenous vein graft, although having a 70% prevalence of diabetes, had the best patency after 6 months (92.8%). This was a significantly higher patency rate in comparison with both the PTFE subgroup (71.4%) and the second group of patients with stenting (58.3%). This high significance is most probably due to the natural material the great saphenous vein is, in which endothelium still produces nitric oxide, and to the high index of neointimal proliferation, which is most probably stimulated by a foreign body (prosthesis or stent) and which is multiplied in diabetic patients because of tissue hypoxia. In future, new generations of stents [7, 8] and prostheses with artificial endothelium would probably have equal or even better characteristics than the great saphenous vein graft.

The six-month mortality rate did not differ between the two groups and it was 2% in the first group. There was no lethal outcome in the second group. It was most probably a result of complications of a large number of concomitant diseases in the cardiovascular, cerebrovascular and renal systems as well as a result of the natural progressive course of atherosclerosis. There were also no substantial differences in the complications (amputations, vasospasm, hematomas) between the two groups (4%, 4%, 2% *vs* 5%, 5%, 5%) and they were comparable with many studies reporting a low complication rate – up to 9% [9, 10]. In comparison with the conservatively-medicamentous-treated groups the complication rate in these groups ranged from 7 to 14% [11].

It is not an easy task to compare experiences about the success of stenting and surgical revascularization bearing in mind the broad dispersion of results published in different studies related to this problem. In addition to this, it has to be mentioned that the majority of studies consist of a small cohort of patients and the results are prone to dispersion and flaws and, to a great extent,

they are not real as is the case with our study. Furthermore, we have to criticize the fact that many studies present obvious and expected results, that is, short lesions are treated by stenting and longer ones by surgical revascularization. We made an attempt to present less expected results by analysing complex correlations with comorbidity, distal runoff, length of lesion and the clinical stage of the disease. We believe we have raised new issues that will undoubtedly have a large impact on making the final decision – stenting or surgical revascularization.

## *Conclusion*

The conclusions of this study are the following:

1. The autologous great saphenous vein should be the preferred graft material for reconstruction of the femoropopliteal segment regardless of the length of lesion, stage of disease, and especially poor lower limb runoff.

2. PTAS in patients with short-segment lesions and non-diabetic patients with a good lower limb runoff give similar haemodynamic results as the autologous great saphenous vein.

3. PTAS in patients with insulin-dependent *diabetes mellitus* yields poor haemodynamic results and a low stent patency rate and thus, the great saphenous vein and then PTFE grafts are preferred graft material in diabetic patients.

4. PTAS has a substantially higher rate of initial procedure failure, which is a result of the technical inability to cross or dilate the lesions.

5. PTFE vascular grafts are a graft material of choice only in cases when the great saphenous vein has been used, damaged while extirpated, when it has a small lumen (> 4 mm), is calcified or varicosely changed and when the occlusion is longer than 4 cm.

## REFERENCES

1. Dotter CT., Judkins MP. (1964): Transluminal treatment of atherosclerotic obstructions: description of new technique preliminary report of its application. *Circulation;* 30: 654–670.

2. Sauel e Wilson, Gerald L. Wolf, Anne P. Cross (1988): Percutaneous transluminal angioplasty versus operation for peripheral arteriosclerosis. Report of a prospective randomised trial in a slected group of patients. *Journal of Vascular Surgery;* June 13–14.

3. Martin EC., Fankuchen EI., Karlson KB. *et al*. (1981): Angioplasty for femoral artery occlusion: comparison with surgery. *AJR;* 137: 915–9.

4. Darling RC., Linton RR. (1972): Durability of femoropopliteal reconstruction. *AM. J Surg;* 123: 472–479.

5. Krepel VM., van Andel GJ., van Erp WFM. *et al*. (1985): Percutaneous transluminal angioplasty of the femoropopliteal artery: initial and long-term results. *Radiology;* 156: 325–8.

6. Johnston KW., Rae M., Hogg-Johnston SA. *et al*. (1987): Five-year results of a prospective study of percutaneous transluminal angioplasty. *Ann Surg;* 206: 403–13.

7. Halkin A., Selzer F., Marroquin O., Laskey W., Detre K., Kohen H. (2006): Clinical outcomes following percutaneos coronary intervention with drug-eluting vs bare metal stents in dialysis patients *J. of Invasive Cardiology;* Dec; 18(12): 577–83.

8. Tang GL., Morasch MD. (2007): Role of stents, drug-eluting stents and stent grafts in treatments of infrainquinal arterial disease. *Semin Vasc Surg Mar;* 20(1): 37–41.

9. Kudo T., Chandra F., Ahn S.: The effectiveness of percutaneous transluminal angioplasty for the treatment of critical limb ischemia: A 10-year experience. *Journal of Vascular Surgery;* Volume 41, Issue 3, pp. 423–435.

10. Klinkert P. (2003): Vein versus polytetrafluoroethylene in above-knee femoropopliteal bypass grafting: Five-year results of a randomized controlled trial. *Journal of Vascular Surgery;* Volume 37, Issue 1, pp. 149–155.

11. Tepe G., Schmehl J., Heller R., Wiesinger B., Claussen CD., Duda SH. (2006): Superfitial femoral artery:current treatment options Eur. *Radio;* Jun; 16(6): 1316–22.

Резиме

## ФЕМОРО-ПОПЛИТЕАЛЕН BYPASS *VS* ПЕРКУТАНА ТРАНСЛУМИНАЛНА АНГИОПЛАСТИКА И СТЕНТИРАЊЕ ВО ТРЕТМАНОТ НА ПЕРИФЕРНАТА АРТЕРИСКА БОЛЕСТ НА ИНФРАИНГВИНАЛНИОТ СЕГМЕНТ – КРАТКОРОЧНИ РЕЗУЛТАТИ

**Цветановски М. В.,[1] Јовев С.,[1] Цветановска М.,[2] Блажевски Б.,[3] Чоланчески Р.,[1] Андреевска Т.,[1] Граматниковски Н.,[1] Карталов А.[4]**

*[1]Клиника за торакална и васкуларна хирургија, Клинички центар, Скопје, Р. Македонија*
*[2] Клиника за инфективни болести, Клинички центар, Скопје, Р. Македонија*
*[3] Клиника за неурохирургија, Клинички центар, Скопје, Р. Македонија*
*[4] Клиника за анестезиологија и реанимација, Клинички центар, Скопје, Р. Македонија*

Апстракт: Критичната исхемија на ногата која се должи на оклузивната артериска болест во инфраингвиналниот сегмент претставува основна индикација за артериска реваскуларизација, која подразбира креирање на феморо-поплитеална bypass процедура или интервентна процедура (стентирање) со која се премостува оклудираниот сегмент. Иако индикациите за двете техники се јасно дефинирани, контроверзи сè уште постојат. Затоа целта на оваа студија беше да се утврдат краткорочните резултати на пациентите третирани со овие два модалитети на третман.

Во периодот помеѓу 2002 и 2008 година беа анализирани вкупно 70 пациенти со артериска оклузивна болест на долните екстремитети. Од вкупниот број кај 50 пациенти беше направен fem-pop bypass. Од нив кај 30 (60%) пациенти беше употребен PTFE материјал а кај 20 (40%) пациенти беше употребена автологна вена сафена. Во втората група имаше 20 пациенти каде што беше направено стентирање. Кај пациентите третирани со хируршка реваскуларизација главна индикација за операција беше артериската оклузивна болест во: стадиум 2 – кај 10 пациенти (20%), стадиум 3 – кај 5 пациенти (10%), стадиум 4 – кај 25 пациенти (50%) а останатите 10 пациенти (20%) беа со субакутна исхемија. Артериографски се евидентираа три потколенични проодни гранки кај 18% од случаите, две проодни потколенични гранки кај 40% од случаите и една проодна потколенична гранка кај 32% од случаите. Помеѓу двете подгрупи немаше сигнификантна разлика во однос на индикациите ниту во однос на артериографскиот наод. Интервалот на следење беше 6 месеци, а проодноста беше 85% (17) за венскиот bypass, 11 (64,6%) – краткосегментни (< 4 cm) и 6 (35,3%) долгосег-

ментни (> 4 cm)), наспроти 76,5% (23) за PTFE графтот (p < 0,05) од кои 1 3 (56,5%) краткосегментни < 4 cm и 10 (43,5%) долгосегментни (> 4 cm). Во втората група беа добиени следниве резултати. Процентот на иницијално успешни стентирања беше 85%. Неуспешна беше кај два пациенти или 15%, технички неуспешна беше кај еден пациент или 5%. Проодноста по 6 месеци изнесуваше 75% (15). Од нив 11 пациенти (73,2%) беа со краткосегментни оклузии (< 4 cm) додека 4 пациенти (26,8%) со лезии (> 4 cm).

Базичната вредност на потколеничниот индекс (ABI) сигнификантно се зголеми во двете групи, и тоа од 0,41 на 0,91 во групата на хируршка реваскуларизација, и од 0,47 на 0,88 во втората група третирана со стентирање. Истиот тренд се задржа и на шест месечната контрола.

Оваа студија демонстрираше мала но сепак сигнификантна разлика (85% vs 75%, p < 0,05) во корист на автологната вена сафена, која треба во сите случаи да биде преферирана графтен материјал за реконструкција на феморо-поплитеалниот сегмент. Споредена со вкупната проодност на PTFE графтовите по 6 месеци немаше сигнификантна разлика со проодноста во групата третирана со стентирање (76,5% vs 75%). Но сепак стентирањето е метод на избор во третман на краткосегментни оклузии – помали од 4 cm со добар ran off (73,2% vs 64,6%, p = ns), при што се гледа дека резултатите се идентични како и третманот со автологна голема сафенска вена, но споредено со употребата на PTFE резултатите наложуваат употреба на стент (73,2% vs 56,5%, p < 0,005). Протезите (PTFE) се изборен графтен материјал кога VSM е употребена, оштетена или калцифицирана, а оклузијата е подолга од 4 cm и не е погодна за стентирање (43,5% vs 26,8%, p < 0,001).

**Клучни зборови:** периферна артериска болест, феморо-поплитеален bypass, перкутана транслуминална ангиопластика со стентирање.

**Corresponding Author:**

**Cvetanovski M. Vlatko**
**University Thoracic and**
**Vascular Surgery Clinic,**
**Skopje, R. Macedonia**
**Tel. 071 386 861; 24 62 106**

**E-mail: mcvetanovska2001@yahoo.com**