

THERAPY

Results of therapy of lower extremity ischemic disease by angiosurgery and radiointervention (PTA) methods

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The aim of our work is to evaluate the results of therapy of lower extremity ischemic disease (LEID) in patients treated at 2nd Department of Surgery, St. Anne's Teaching Hospital, Brno, in 2000. According to the therapeutic approach, the patients were divided into two groups: 1. reconstructive angiosurgeries (95 patients), 2. PTA (42 interventions in 36 patients).

The short-term follow-up (18 months) has given the following results: in the group of surgical interventions – the patency was 87.37 %, in the PTA group it was 83.33 %. There was a marked difference between the patency of PTA reconstructions in the region of pelvic arteries (100 %) and that in the femoropopliteal region (58.83 %).

We have found out that in the solution of LEID, angiosurgeries and radiointerventions are equivalent methods and that they complement each other. (Tab. 2, Fig. 3, Ref. 10.)

Key words: balloon angioplasty, stent, angiosurgical reconstruction, bypass, lower extremity ischemic disease, patency.

The aetiopathogenesis of occlusions of arteries in lower extremities is in most cases arteriosclerosis (which is a whole group of diseases including atherosclerosis, Mönckeberg's mediscclerosis, arteriolosclerosis and diabetic angiopathy), inflammatory obliterating arterial diseases or compressive syndromes of arteries (a. poplitea) or other occlusive diseases (cystic degeneration of adventitia). Atherosclerosis is the cause of occlusions in as many as 90 % cases. Prevalence of LEID in the group of 50–70 years old people amounts up to 20 %. In the age group under sixty the disease afflicts men 4–6 times more frequently than women, in the age group above sixty it is only 2.5 times more frequent. Risk factors include hypertension, diabetes mellitus, nicotineism, hyperlipoproteinaemia, family taint. Clinical symptoms are systematically summarized by Fontain's classification (1, 2, 10). Basic therapeutic methods include conservative, endovascular or surgical treatments. The choice of therapeutic approach is always individual (2, 3).

Methods

PTA by means of a double-lumen balloon catheter was carried out for the first time by A. Grüntzig in 1974 and since then time the spectrum of therapeutic procedures routinely using this method has been extending. The principle remains the same – to

penetrate through a narrowed or closed section of an artery by means of the introducing device, to introduce the balloon, to dilate the artery and, as the case may be, to implant a stent. Anticoagulation and antiaggregation are indispensable parts of every procedure. General indication for PTA in the region of pelvic bed or in the region of lower extremity arteries is a short stenosis or obstruction (at our department the solutions are always absolutely individual according to the angiography, in cooperation between vascular surgeons and intervention radiologists) (3, 7).

Reconstructive angiosurgeries – are methods of choice with LEID in the cases where it is necessary to bridge long sections of the arteries afflicted with stenosis or obliteration. According to the location of the stenosis or obliteration we divided the group of interventions into interventions performed in the aorto-iliac region (aorto-bifemoral, aorto-femoral and iliofemoral bypasses) and those in the femoropopliteal region (proximal above the knee, distal below the knee) with which we also took into account the fact

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Tab. 1. Basic characteristics.

	Patients			Patient's age		Average age		
	women	men	together	the youngest	the oldest	women	men	together
Operation count	21	74	95	44	82	63.62	61.98	62.35
%	22.10	77.89	100					
PTA count	9	27	36	44	81	62	61.26	61.44
%	25	75	100					

Tab. 2. Length of hospitalization.

	Hospitalization	
	Operation	PTA
The shortest	6 days	2 days
The longest	105 days	30 days
Average	20.69 days	9.47 days

as to what material the substitute was made of, i.e. whether a venous graft (VSM) or a prosthesis (knitted, PTFE) was used (2, 4).

In both groups of patients we were interested in the state of the reconstruction – patency after one, six, twelve and eighteen months after the discharge.

Patients

Basic characteristics of the sets are summarized in Table 1. In the group of operative solutions (hereinafter set A) 95 patients were included into the study (74 men, 21 women), in the group of cases solved by PTA (hereinafter set B) altogether 36 patients were included (21 men, 9 women) in which a total of 42 interventions were carried out, i.e. 6 patients underwent two procedures. Altogether 20 stents were applied. The average age was 62.35 years in set A, and 61.44 years in set B. Coincidentally the

youngest patients in both groups were 44 years old; the oldest patients in sets A and B were 82 and 81 years old, respectively. Unlike the above parameters, the length of hospitalization differs considerably: 20.69 days in set A (the shortest one – 6 days, the longest one – 105 days) and 9.47 days in set B (the shortest one – 2 days, the longest one – 30 days) (Tab. 2).

Distribution of individual types of operative procedures in set A was as follows: 40x aortoiliac region – 28x aortobifemoral bypass, 7x aortofemoral, 5x iliofemoral; 40x femoropopliteal proximal – 27x VSM, 13x prosthesis, 15x femoropopliteal distal – 11x VSM, 4x prosthesis (Fig. 1).

We divided the set B into two basic groups: PTA in pelvic region – 25 procedures with implantation of 13 stents, and femoropopliteal region (a. femoralis, a. poplitea, crural arteries) – 17 procedures with implantation of 7 stents (Fig. 2).

Results

Figure 3 shows the percentage of patent reconstructions in both monitored groups. After 18 months, there are 87.37 % patent reconstructions in group A, and 83.33 % patent arteries in group B. As to the location of the interventions, in group A we have recorded the following patency: aortoiliac reconstructions 87.5 %, femoropopliteal proximal bypasses 87.5 %, femoropopliteal distal bypasses 86.67 %; in group B the patency amounted to 100 % in the iliac region and to 58.83 % in the femoral region.

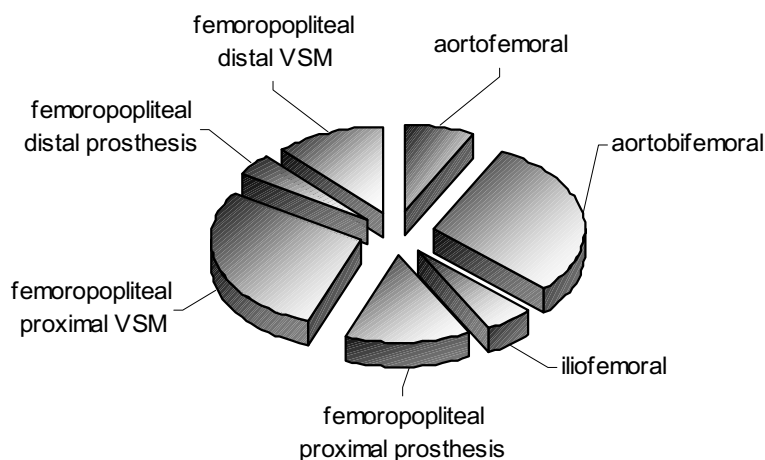


Fig. 1. The types of operative procedures.

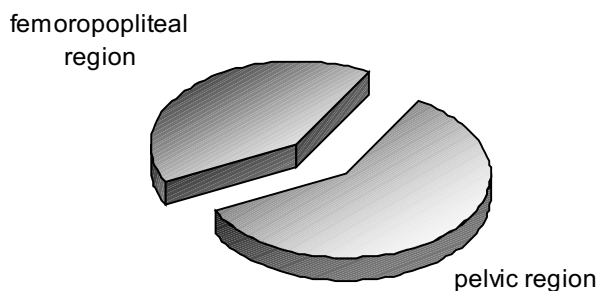


Fig. 2. The types of PTA procedures.

The length of hospitalization of the surgically treated patients was twice as long in comparison with that of patients who underwent the PTA (20.69 days in group A, 9.47 days in group B).

Discussion

The length of hospitalization of the surgically treated patients was twice as long in comparison with PTA (20.69 days in group A, 9.47 days in group B). The difference has been caused not only by straining the patients by the procedure itself – from the necessary preoperative preparation, anaesthesia, the actual surgical technique, to longer convalescence period, but also early complications can make the stay of the patient in the hospital considerably longer. Thus the small number of complicated patients can considerably influence the statistical follow-up of a rather small set (1, 10).

The percentage of patent reconstructions in the monitored groups after 18 months is 87.37 % in group A and 83.33 % in group B.

In the group of operative solutions we have recorded identically 87.5 % patent reconstructions in the subgroups of procedures in the aortoiliac region and femoropopliteal proximal bypasses, and 86.67 % in the subgroup of femoropopliteal bypasses below the knee. The difference between these subgroups is not statistically significant, but the follow-up is still of short-term character. Most literature states the percentage of patency after 5 years' follow-up: 80–95 % with reconstructions in the aortoiliac region (caused especially by the large diameter and high flow in the reconstruction), and more than 80 % with femoropopliteal reconstructions (2, 3, 4, 6, 8, 9).

In group B, (PTA) the total of patency was 83.33 % – in the iliac region it was 100 %, in the femoral region 58.83 %. All occlusions of PTA reconstructions occurred in the femoropopliteal region which, when converted into the number of patients, amounts to 41.17 %. Although the result is unambiguously biased by the error of a set of small number of patients, on the whole it correlates with the theoretical assumption of the least successful type of procedure in the vascular bed. In cases of PTA in pelvic bed the long-term patency after 3–5 years is reported to be 60–90 %, in cases of PTA in the femoral region it is 50–60 % (3, 7, 10).

Revascularization procedures are undoubtedly the most important therapeutic method in patients suffering from lower extremity ischemic disease. They always mean a chance for the patient to improve the prognosis of the disease as well as the qual-

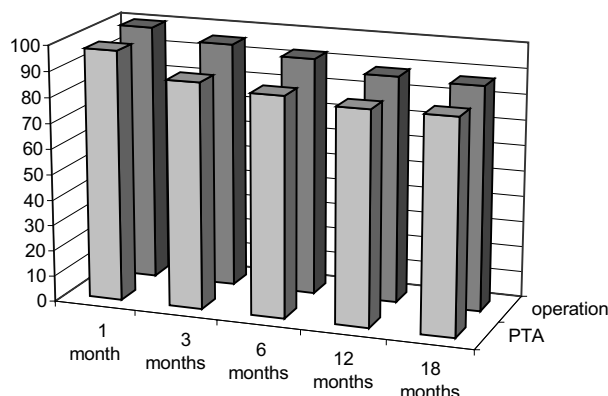


Fig. 3. The percentage of patent reconstructions.

ity of life. But it is always necessary to consider carefully the indications for the procedures, to compare the risk of amputation and the risk of the procedure itself in coincidence with the clinical status.

Our short-term follow-up has confirmed the comparable successfulness of the solutions of pelvic arteries stenoses by means of the angiosurgical method (bypasses) and radiointervention PTA. In the femoropopliteal region, a clear difference is reported between the two methods in favour of angiosurgeries, the fact of which has also been confirmed by our results so far. On the other hand, the lower invasiveness of the procedure, the possibility to solve the cases of stenosis even in polymorbid elderly patients and, last but not least, also the shorter period of hospitalization and convalescence are arguments in favour of PTA.

We can conclude that angiosurgical reconstructive procedures and PTA are equivalent and mutually complementing methods of solving the lower extremity ischemic disease. Both methods bring good results and are beneficial to patients.

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