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Research Article

Evaluation of Endovascular Intervention Therapy Results in Chronic Below-The-Knee (BTK) Arterial Occlusive Disease

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Abstract

Objective: To evaluate the results of endovascular intervention therapy in Below-The-Knee (BTK) arterial disease.

Methods: Retrospective descriptive series of cases. We had researched from January 2015 to May 2017 at Vascular Surgery department in Cho Ray hospital.

Results: The study sample of 80 patients. We had counted 56.3 % female rates, average ages 74.4±11.4. Chief complain symptom was a painfully, 53.8 % sample. Percutaneous transluminal angioplasty (PTA) performed by 76.25%, PTA and stent replacement combination accounted for 23.75%. BTK intervention simple accounted for 36.3%, other combination was 63.7%. The procedure times had 124±39.8 minutes. The time of hospitalization average was 4±2.7 days. Total complication was 3.8% samples with thrombosis had got into 2.5%, hematoma had got 2.5%, amputation had got 1.25% and mortality rate had got 1 case in our research. Technique and short-term results success rates were 85% and 77.5%, respectively.

Conclusions: The intervention endovascular therapy of chronic arterial occlusion of the lower extremity less invasive method which is safe, effective, shorter hospital stays and faster recovery of patients. Results of short-term achieve a high success rate.

Keywords: Arterial Occlusive Disease; Below-The-Knee (BTK); Endovascular Intervention; Peripheral Artery Disease

Introduction

BTK artery disease with vessels of small diameter, the blood flow come in so far. When the disease has been covered, there is usually evidence of severe anemia. Previously, this disease was bypassed, which was a heavily operation that was not effectively. Especially in elderly patients, many factors increase the risk of surgery with ineffectively outflow, or small veins that was difficult to used bypass surgery. Following the success of endovascular intervention for peripheral vascular disease, BTK intervention initially provides positive signs.

At Cho Ray Hospital, in 2012, we initiative has treated patients with peripheral artery diseases by endovascularintervention: Percutaneous Transluminal Angioplasty (PTA), stent placement initially results in satisfactory. The number of patients with chronic obstructive artery diseases came to treatment with this technique was increasing, from 39 cases in 2013 to 197 cases in 2015. However, there are still little research projects in our country. Therefore, the purpose of our study evaluated the results of endovascular intervention therapy chronic Below- The- Knee (BTK) arterial occlusive disease.

Research Methods

Study design: Retrospective descriptive study.

Time study: sampling from January 2015 to May 2017.

Research area: Cho Ray Hospital.

Study subjects: [1]

Standard sampling:

All these cases have BTK artery disease whom admitted Vascular Surgery department. They had performed endovascular intervention.

Exclusion criteria:

Bypass surgery.

Hybrid procedure.

Upper the knee artery diseases haven't revascularize yet or not revascularize enough (upper the knee arteries diameter after ^{3}70%).

Evaluating the results of treatment:

- Evaluation of a successful outcome based interventions: clinical, subclinical [2].

Clinical (Rutherford category)	Improvement in baseline symptoms by at least 1 category
Ultrasound	>70% reduction in luminal diameter suggested by PSVR^{3}3.0
ABI	Increase of > 0.15

-Evaluate the results at 2 times intervention: immediately after surgery, 01 months.

Results

The sample had 09 cases of patients met the inclusion criteria.

- **Age, Gender and Risk Factors, Diseases Combinations:**

	N (%)	Mean
Age	74(100%)	74.41±11.4 (43-92)
Dyslipidaemia	57 (71.3%)	
Hypertension	43 (53.8%)	
Smoking	41 (51.2%)	
Diabetes	34 (42.5%)	
Carotid	16(20%)	
Stroke	9(13.3%)	
Renal failure	7 (8.8%)	
CAD	4 (5%)	
Heart failure	3 (3.8%)	
Cirrhosis	0 (0%)	

Table 1.1: Age, Gender and Risk Factors, Disease Collaboration.

- **Rutherford Category:**

Stages	Category	N (%) before	N (%) after
0	0	0 (0%)	0 (0%)
	1	0 (0%)	5 (6.3%)
	2	2 (2.5%)	4 (5%)
	3	6 (7.5%)	18 (22.5%)
II	4	13 (16.3%)	23 (28.7%)
III	5	18 (22.5%)	19 (23.8%)
IV	6	41 (51.2%)	11 (13.8%)
Total		80 (100%)	80 (100%)

Table 1.2: Rutherford Category.

- **TASC II classification:**

Stages	N (%)
A	0 (0%)
B	3 (3.8%)
C	26 (32.5%)
D	51 (63.7%)
Total	80 (100%)

Table 1.3: TASC II classification.

- **The relationship between TASC II with clinical symptoms:**

		IC	CLI
	A	0(0%)	0 (0%)
	B	1 (1.25%)	2(2.5%)
	C	10 (12.5%)	16 20%)
	D	1(1.25%)	50 (62.5%)
Total (%)		12(15%)	68 (85%)

Table 1.4: The relationship between TASC II with clinical symptoms:

Result

- **Anaesthesia**

	N	%
Endotracheal	1	1.25
Spinal	0	0
Local	79	98.75
Total	80	100

Table 1.5: Anaesthesia

- **The Approach Way**

	N	%
Antegrade	80	100
Retrograde	0	0
Total	80	100

Table 1.6: The Approach Way

- **Endovascular Methods**

	N	%
PTA	61	76.25
Stent	0	0.0
PTA+ Stent	19	23.75
Total	80	100

Table 1.7: Endovascular Methods

- **Limbs Intervention**

Limbs	N	%
01 limbs	80	100
02 limbs	0	0
Total	80	100

Table 1.8: Limbs Intervention

- **Floor Intervention**

Floor intervention	N	%
BTK	29	36.3
FP+BTK	44	55
Iliac+BTK	3	3.8
Iliac+FP+BTK	4	5
Total	80	100

Table 1.9: Floor Intervention

- **Length of hospital stay (LOS), Intervention time**

Time	Mean
Intervention time(min)	124±39.8 (45-230)
LOS(day)	4±2.7 (1-18)

Table 1.10: Length of hospital stay(LOS), Intervention time.

- **Complication**

	complication							
	Occlusion	Hematoma	Amputation	Fistula	Pseudoaneu-rysm	Penetrated	MI	Died
	2	**2**	**1**	**0**	**0**	**1**	**0**	**1**
Total N (%)	**3 (3.75%)**							

Table 1.11: Postintervention Complication

- **Intervention Results**

Results	Success	Fail
Post (n= 80)	85% (68)	15% (12)
Short-term (n= 80)	77.5% (62)	22.5% (18)

Table 1.12: Intervention Results

Discussion

In the study, we found a high proportion of women than men. Our sample reported smoking 41 cases, got 51.2% samples, lipid metabolism disorders has 57 cases, got 71.3% samples. According to other documents [2,3], smoking and lipid metabolic disorders becomes a factor accelerating the process of pathological blood vessels, increases the severity of the disease and significant impact on disease chronic arterial occlusion of the lower extremities.

The Main Symptom: Is pain hospitalized patients, accounting for 53.8% with severe clinical manifestations, recorded most cases classified under Rutherford 5, 6 degrees, 73.7% accounted for. Of these, 41 cases, accounting for 51.2% of the samples studied had ulcers or gangrene. In the study sample, only recorded lesions TASC II C and D accounted for 32.5% and 63.7 respectively%. As recommended by the 2nd update TASC (Transatlantic Inter-Society Consensus) [4], those to TASC II C may be surgery or intervention, while the TASC II D lesions should surgery. However, in this group, older patients, combining multiple severe medical conditions, are at high risk cannot perform surgery. Therefore, we carried out interventions for this patient population, initial positive results.

The Method of Anaesthesia: Local anaesthesia got 98.7% sample. These are the advantages of endovascular interventions. After the intervention, the patient recovers faster and avoid complications of anaesthesia. This is very heavy on older patients, patient coordination. Interventions: Mostly PTA method, accounting for 76.25% of the sample studied. PTA combined stent replacement a low percentage, 23.75% of the sample studied. We have not recorded any case in stent replacement simply. This shows that the question is not the first choice for stent replacement in BTK intervention. Because of the characteristics of blood vessels BTK is the small blood vessels, extend stenosis lesions, low flow is at risk or restenosis after stent replacement. However, because the study sample was small, the study design was not strong enough, so we thought should be studied in more detail on this issue because there is evidence that stent replacement still effective [5,6]. On the other hand, according to other authors [7-9], PTA with balloon drug is also positive results in the form that this study does not have to be.

We intervene mainly BTK floor, accounting for 36.3%, coordinating BTK occupied 55% femoro- popliteal floor. All the cases we intervene 1 limb. Intervention time average 124 minutes, the average length of hospital stay 05 days.Complications Interven-

tion: We had 03 cases with 3.75% sample studied. Including 01 cases of hematoma at the needle position, we must proceed hematoma surgically removed; there are 01 cases of embolism after intervention leg to amputation of the lower 1/3 of the left thigh. There are 01 cases of embolism, penetrated and hematoma at the right calf, we need to perform removal hematoma, fasciotomy.

Evaluate the Results: Endovascular intervention method merely succeeded lower limb reperfusion achieve good results, with success rates of 85% technical. Results in the period accounted for 77.5% short term. We found that the intervention time and length of hospital stay in our study sample longer than the other authors [5,8]. However, this is the first phase we performed to intervene which should not have much experience and equipment are limited. Endovascular interventions have significantly improved clinical symptoms, subclinical in the short term. Once again confirms the effectiveness of this approach to patients with chronic below-the-knee arterial occlusive diseases. Especially older patients, with severe medical conditions, high risk factors.

Conclusion

By studying 80 cases of chronic below-the-knee arterial occlusive diseases were treated with endovascular interventions, we have concluded the following:

- Patients who are almost the same between men and women, elders have many risk factors and diseases coordination.
- Patients with severe clinical presentation with symptoms of critical limbs ischemia, TASC II C and D classification.
- Shorter length of hospital stayed and faster recovery of patients.
- Endovascular intervention is less invasive methods, technical success accounted for 85% and short-term results accounting for 77.5%.

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