PERCUTANEOUS TRANSLUMINAL ANGIOPLASTY IN PATIENTS WITH CRITICAL LIMB ISCHEMIA

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ABSTRACT

Peripheral artery disease is one of the manifestation of systemic atherosclerosis and comprises those entities which result in obstruction to blood flow in the arteries exclusive of the coronary and intracranial vessels. The prevalence of peripheral artery disease increases with the age of the population. Chronic critical limb ischaemia defined as more than two weeks of rest pain, ulcers tissue loss attributed to arterial occlusive disease, is associated with great loss of both limb and life. Therapeutic goals in treating patients with CLI include reducing cardiovascular risk factors, relieving ischaemic pain, healing ulcers, preventing major amputation, improving quality of life and increasing survival. Interventions such as balloon angioplasty, stenting and surgical revascularization should be considered in these patients. The choice of intervention is depend on the anatomy of the stenotic or occlusive lesion. (FMI 2014;50:249-253)

Keywords: Atherosclerosis, critical limb ischaemia, percutaneous balloon angioplasty

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INTRODUCTION

The main clinical manifestations of atherosclerotic process and atherotrombosis form of transient ischemic attack (TIA), ischemic stroke, angina pectoris, myocardial infarce and intermittent claudication (Gonzales & Kannewurf 1998). Peripheral arterial disease is a systemic manifestation of the atherosclerotic process, as seen in coronary arteries in the heart and cerebrovascular blood vessels. The initial symptoms of the major and peripheral arterial disease is intermittent claudication defined as pain in the muscles when walking. When claudication did not receive adequate management it will worsen the disease until the pain at rest. In the advanced phase of peripheral arterial disease tissue hypoperfusion will appear, triggering the onset of ischemic ulcers to gangrene which required amputation action on more than a third of patients. This phase is known as Critical Limb Ischemia (CLI). In some studies found mortality of the 1st year of about 20-25% in patients with CLI (Luther et al 1996, Wolfe 1986, Anonymous 1997).

CLI is defined as a state of rest pain, ulceration or loss of body tissue that occurs for more than two weeks as a result of arterial occlusive disease. On Clinical presentation during the 1st year, 25% of patients with CLI experienced resolution, while 20% had progression, 30% require amputation while 25% died (Norgren et al 2007). The goal of therapy in patients with CLI, among others, control of cardiovascular risk factors, reduces ischemic pain, heal ulcers, prevent amputation, improving the quality of life and reduce mortality. To achieve therapeutic goals can be reached with the management of aggressive medical, revascularization and amputation if necessary (Norgren et al 2007). This case report will present a patient with multiple cardiovascular risk factors who suffered from peripheral
arterial disease who had CLI requiring percutaneous angioplasty as the preferred method of revascularization in which the results obtained after percutaneous intervention can be avoided amputation in patients.

CASE REPORT

A female patient of 55 years old was sent from a regional hospital in Kediri with a chief complaint of pain on right foot. Leg pain was initially felt since 15 days before entering the hospital. Pain was felt when at rest and became severe when it was moved. The last five days the right foot began to appear reddish on the soles of the feet were painful. In a longer time blackish spots appeared on the inside of the right foot. During Kediri hospitalization, the patient could not walk due to leg pain when moved. Shortness of breath (-), chest pain (-), palpitations (-). Past medical history revealed hypertension since 5 years previously and routine medical treatment. Diabetes mellitus was undeniable. Patients also complained since the first of this year when the walk is stiff in both legs but heavier on the right foot, especially the right calf area.

Physical examination of the patient revealed a weak general condition, blood pressure 140/80 mm Hg, pulse 100 x/min, anteroseptal ischemia. Thorax photograph obtained cardiomegaly with a CTR of 60%. Patients undergoing coronary angiography and arteriography on the right inferior extremity. The results of coronary angiography showed: left main normal, lesions 60% in ostial LAD, LCX and RCA normal. From the results of selective arteriography of the lower extremities obtained the right side picture of chronic total occlusion in the distal third right posterior tibial artery and small collateral obtained from the anterior tibial artery.

The approval of the family of percutaneous intervention such as angioplasty, using a balloon to the lesion in the posterior tibial artery from proximal to distal and vice versa from distal to proximal. Post-angioplasty action revealed no complications with the results of TIMI flow grade II. Five days after percutaneous angioplasty, the patient had not complained of pain again and could stand up and walk again with the help of a body supporter. Besides undergoing percutaneous angioplasty the patient also received aspirin therapy medicament form, clopidogrel, Cilostazol, Ace inhibitors, and Simvastatin.

DISCUSSION

The process of atherosclerosis that occurs in the lower extremities may occur in large arteries starting from the infrarenal aorta until the very end of a branch of the tibial artery. This process usually occurs in early adult life and progress slowly walking up to the point where there is a decrease in blood flow or blockage appears in the arterial blood vessels. When symptoms or clinical complaints, the process of the obstruction usually occurs in multilevel blood vessels (Veith et al 1990). Patients with significant lesions can be classified into five stages according to their clinical presentation.

<table>
<thead>
<tr>
<th>Inspection</th>
<th>Right</th>
<th>Left</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inspeccion</td>
<td>Redness, blackish area in medial plantar pedis</td>
<td>Normal</td>
</tr>
<tr>
<td>Palpation</td>
<td>Edema (+), pressure pain (+), cold (+)</td>
<td>Edema and pressure pan (-) warm</td>
</tr>
<tr>
<td>Pulsation</td>
<td>Femoral artery (+)</td>
<td>Femoral artery (+)</td>
</tr>
<tr>
<td></td>
<td>Popliteal artery (+)</td>
<td>Popliteal artery (+)</td>
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<tr>
<td></td>
<td>Dorsalis pedis artery (+)</td>
<td>Dorsalis pedis artery (+)</td>
</tr>
<tr>
<td></td>
<td>Posterior tibial artery (-)</td>
<td>Posterior tibial artery (+)</td>
</tr>
<tr>
<td>ABI</td>
<td>0.4</td>
<td></td>
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</tbody>
</table>

Laboratory results obtained hemoglobin 12.6 g/dl, leukocytes 6220, platelets 272 000, 101 random blood sugar, BUN 15, serum creatinine 0.52, 36 SGOT, SGPT 35, total cholesterol 274 g/dl, LDL 105 g/dl, HDL 44 g/dl, triglycerides 125 g/dl, electrolyte levels within normal limits. Patient ECG showed sinus rhythm of 100
Initial evaluation of patients with peripheral arterial disease include careful physical examination and non-invasive investigations others. Examination arterial pulsation needs to be done carefully to determine the location of blocked blood vessels while investigations are needed not only to help with the diagnosis but also further intervention step (Moneta et al 1994). Several investigations can be done to help with the diagnosis of peripheral arterial disease include ABI measurement, Duplex Scanning, Spiral CT and Magnetic Resonance Angiography (Fleischmann et al 2006). Ankle Brachial Index (ABI) is an objective and efficient method to assess the presence of peripheral arterial disease and the degree of severity of the disease. Normal ABI values greater than 1.0 while patients with claudication typically have a value of between 0.50 to 0.90 while a lower ABI values obtained in patients with rest pain and tissue loss. In patients with diabetes mellitus and renal failure, may increase ABI false value as a result of excessive calcification of the arteries (Ubbink et al 1997, Ouriel & Zarins 1982).

In patients with stage I to II began to complain of onset of intermittent claudication (IC). Claudication is taken from the Latin word meaning claudication limp. IC is defined as pain that occurs at the foot when walking and relieved by rest. Some patients describe the IC as heaviness, weakness and fatigue without pain so often happens misdiagnosis where IC is considered as neuromuscular disorders. In addition to neuromuscular, symptoms similar to claudication may occur in the cauda equina compression as well as other neurological disorders. Patients with stage III and IV are the group most threatened tool motion although some patients feel only a mild ischemic rest pain and stable for several years. Rest pain itself is difficult diagnosed as vascular abnormalities, especially when there is no sign of support such as a decrease of pulsation, atrophy and a decrease in the temperature of locomotor and rubor (Sanchez & Veith 1998).

Identification of risk factors for atherosclerosis is an important key to handling optimally peripheral arterial disease. Some traditional risk factors such as smoking, diabetes mellitus, hypertension, and dyslipidemia has been shown to have a significant role in the progression of atherosclerosis (Criqui 2001, Newman et al 1993). Patients complained of pain in the right foot with the emergence of black spots on the inside of the right foot. Pain was felt when the patient was still and the patient could not move the right foot because of the increasing pain when used for walking. The patient also complained stiffness during the past year, especially felt on the right foot. Patient suffered from hypertension which was found since 5 years ago and obtained their dyslipidemia.

<table>
<thead>
<tr>
<th>Stage</th>
<th>Presentation</th>
<th>Invasive, diagnostic and therapeutic intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>No signs or symptoms</td>
<td>Never justified</td>
</tr>
<tr>
<td>I</td>
<td>Intermittent claudication (1 block)</td>
<td>Usually not justified, but may be necessary</td>
</tr>
<tr>
<td>II</td>
<td>Severe claudication (2 block)</td>
<td>Sometimes justified</td>
</tr>
<tr>
<td></td>
<td>Dependent rubor</td>
<td>May remain stable</td>
</tr>
<tr>
<td>III</td>
<td>Rest pain</td>
<td>Usually indicated but may do well for long periods without revascularization</td>
</tr>
<tr>
<td></td>
<td>Atrophy, cyanosis</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Decreased temperature</td>
<td></td>
</tr>
<tr>
<td>IV</td>
<td>Non-healing ischemic ulcer or gangrene</td>
<td>Usually indicated</td>
</tr>
</tbody>
</table>

Figure 2. The value of ABI with clinical symptoms
Patients with Ankle Brachial Index measured by the results 0.4. The results of angiography in the right lower limb lesions obtained in the form of a chronic total occlusion in the posterior tibial artery with little collateral obtained from the anterior tibial artery. The goal of therapy in patients with CLI, among others, control of cardiovascular risk factors, reduce pain, heal wounds, prevent amputation, improving quality of life and reduce mortality (Slovut & Sullivan 2008). Medicament therapy include analgesics, wound care, as well as overcoming infection, and aggressively controlling existing cardiovascular risk factors. Most patients with CLI have comorbidities cerebrovascular and coronary heart disease, due to the aggressive control of risk factors.

Stopping smoking, controlling diabetes mellitus, blood pressure and blood lipid levels needs to be done immediately and simultaneously granted for optimal results. In patients with peripheral arterial disease who have a high risk factor, the target LDL levels in the blood is less than 70 g/dl in which statins may be given as first choice. Antihypertensive therapy should be administered to the patient in order to achieve a target blood pressure of less than 140/90 mmHg in non diabetic patients and below 130/80 in patients with diabetes mellitus and chronic kidney disease. ACE inhibitor therapy is recommended as the first choice of hypertension in patients with peripheral arterial disease. HOPE study demonstrated in patients with symptomatic peripheral arterial disease, administration of Ramipril lowered the risk of myocardial infarction, stroke and death from vascular approximately 25%. The use of antiplatelet and antithrombotic is necessary to reduce the risk of myocardial infarction, stroke or death from vascular. Recommended aspirin dose is 75-325 mg/day and clopidogrel 75 mg per day. Administration of cilostazol in addition to being anti-thrombotic also serve to reduce the complaints of claudication, the recommended dose is 100 mg twice a day, but the use of cilostazol should be avoided in patients with heart failure (Hirsch et al 2006).

Patients received medicament aggressive therapy to control cardiovascular risk factors such as administration of statins, ACE inhibitors, aspirin, clopidogrel and Cilostazol. In patients with severe locomotor ischemia, then medicament therapy alone is not enough. If no immediate intervention in the form of revascularization, amputation will then become inevitable. In one study involving 142 patients who did not undergo revascularization, amputation figures in 12 months in patients with ABI 0.5-0.7 is 15% while when ABI less than 0.4 digit amputation 46% (Marston et al 2006). The choice of revascularization of patients with CLI in the form of surgery, endovascular intervention, or a combination keduanya.16 Surgery is aimed at patients with complex lesions that do not allow for endovascular action as well as for younger patients with longer life expectancy requiring patency of revascularization better. In the below-knee lesions, percutaneous angioplasty intervention has traditionally been the choice of revascularization in the CLI. Over the past decade, angioplasty has replaced surgery as the primary choice in patients with CLI at some medical centers. Endovascular revascularization is an attractive option because of minimal intervention, reducing the cost of hospitalization, morbidity and low mortality and hospital care shortening time (Adam et al 2005). Endovascular therapy today many use the equipment and techniques commonly applied in percutaneous coronary interventions. Until now, percutaneous interventional procedures for lesions below the knee can save locomotor patients up to 60% in the case of occlusion and can even be up to 90% of the lesions were more modest. Profile of saving the limb at 2 to 5 years ranged from 80 to 90% with modern endovascular techniques. The success of interventions seen from the loss of a complaint of pain, ulcers healing, amputation can be avoided and blood vessel patency in the long term (White & Gray 2007).

Patients, besides getting medicament aggressive therapy to control cardiovascular risk factors, also underwent percutaneous revascularization in the form of angioplasty. Angioplasty is done by using the equipment and techniques commonly used in percutaneous coronary interventions. Post-percutaneous intervention, pain in the feet of patients is greatly reduced and the patient can stand up and start running again at 5 days post-angioplasty action.

CONCLUSION

We have reported cases of patients with the diagnosis of Critical Limb ischemia with risk factors for hypertension and dyslipidemia. The patient also suffered from ulcers on right medial plantar pedis. ABI obtained from the evaluation of the numbers 0.4 and patients underwent coronary angiography which found 60% stenosis lesion in the proximal LAD and the right inferior extremity selective angiography obtained as high as chronic total occlusion of the posterior tibial artery and the presence of small collateral tibial arteries anterior. The patient underwent percutaneous intervention such as angioplasty balloons used in coronary intervention. In addition to intervention for revascularization, the patient also received medicament treatment aggressively to control cardiovascular risk factors. Five days after percutaneous intervention, foot...
pain is much reduced and the patient could already stand up and walk again.

REFERENCES


Fleischmann D, Hallet RL, Rubin GD (2006). CT angiography of peripheral arterial disease. J Vasc Interv Radiol 17, 3-26


