Acute Limb Ischaemia: Case Report

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ABSTRACT
Acute limb ischaemia (ALI) is defined as a sudden decrease in limb perfusion that threatens the viability of the limb. Physical findings may include absence of pulse distal to the occlusion, cold and pale or mottled skin, reduced sensation, decreased strength and may be associated with ischemic stroke and myocardial infarction. A 41-year-old male came to emergency room (ER) with necrosis in the left and right legs and feet. Patient was diagnosed with acute limb ischaemia. Duplex sonography femorals, angiogjet and percutaneous intra arterial thrombolysis were done 2 days after the first symptoms. The patient was amputated on both legs and the patient recovered.

Key words: acute limb ischaemia, necrotic, amputation

INTRODUCTION
The incidence of acute limb ischaemia (ALI) is approximately 1,5 cases per 10,000-person per year. Causes of ALI include acute thrombosis of a limb artery or bypass graft, embolism from the heart or a diseased artery, dissection, and trauma (severing of an artery or thrombosis). The clinical presentation is considered to be acute if occurs within 2 weeks. The rapid onset of limb ischaemia results from a sudden cessation of blood supply and nutrients to metabolic active tissues of the limb, including skin, muscle, and nerves.1,2 Atherosclerosis-induced acute limb ischaemia may threat viability of limbs as it may cause necrosis.1 We report a case of acute limb ischaemia with necrosis.

CASE PRESENTATION
A 41-year-old male came to ER with swelling and pain in both calves and legs since 10 days before admission. Stabbing pain was felt in the upper tip of the calves upon walking and relieved with rest. Initially the pain was only felt like a muscleache but then got worse during the day and was accompanied by swelling. Edinburgh claudication questionnaire showed positive claudication. Patient was a heavy smoker (> 24 cigarettes/day). History of previous surgery was denied. Body Mass Index (BMI) was 34.60 kg/m² (WHO criteria: obese). His elder brother had a heart failure. Patient had already underwent duplex femorals sonography, angiogjet and percutaneous intra arterial thrombolysis 2 days after symptoms developed. Result of Duplex sonography femorals artery showed (Figure 1–3):

1. Triphasic Doppler curve morphology on aorta abdominalis dan right femoralis communis artery showed that colour code doesn’t fill blood vessel lumen of right poplitea artery, right anterior tibialis artery and left posterior tibial artery.
2. Monophasic Doppler curve morphology showed high end-diastolic pressure from bilateral communis femoral artery, superficial femoralis artery, poplitea artery, anterior tibialis artery and left posterior tibial artery.
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3. Right superficial femoral artery, poplitea artery, posterior-anterior tibialis artery occlusion.

4. Left iliaca artery, communis femoralis artery, poplitea artery, posterior-anterior tibialis artery occlusion.

5. Normal vein flow in both leg.

6. Deep vein thrombosis was not found in deep vein of both legs.

There was bleeding with significant decrease of hemoglobin, the thrombolytic agent was stopped. Echocardiography revealed LV septal hypertrophy, normal systolic and diastolic function, normal valves, and no thrombus. Electrocardiography couldn’t be done due to necrosis of both legs and calves. He was given irbesartan 300 mg once daily, fenofibrate 300 mg once daily, alprazolam 0,5 mg once daily, lactic acid (per 5 mg: phenolphthalein 55 mg, liqd parafin 1200 mg, glicerine 378 mg) 30 ml 3 times daily, pantoprazole 30 mg twice daily, ceftriaxone 2 gram once daily, tramadol drip, amlodipine 10 mg once daily, allopurinol 100 mg 3 times daily, clopidogrel 75 mg once daily, paracetamol 500 mg 3 times daily.

The patient had normal blood pressure (on antihypertensive drug), normal heart rate, normal respiratory rate, and slightly increased body temperature. Head and neck was clear. Cardiovascular examination was normal. Lungs were clear, and abdominal examination was normal. Left leg examination revealed necrotic tissue above knee, pus in the digiti I-V, blood, and no sensory sensation. Right leg examination revealed necrotic tissue below knee, edema and bulla, and no sensation below knee. Laboratory studies showed anemia (Hb: 10), leucocytosis (WBC: 16,8), slight increase of BUN (BUN:60), and high level of transaminase (AST/ALT: 200/273). Trombocyte count, creatinine, random blood glucose and lipid profile were normal.

On admission, amputation above knee on both legs was suggested but the patient refused. He was treated with ceftriaxone 1 gram injection twice daily, ketorolac 30 mg injection three times a day, micronized purified flavonoid fraction 500 mg tablet three times a day, cefadroxil 100 mg tablet twice daily, Warfarin Na 2 mg once daily at night, amlodipin 5 mg tablet once daily.

On third day patient agreed to have first amputation on the left limb. On physical examination he had tachycardia (112 bpm), regular tachypnea (24 bpm), and fever (39 °C). Laboratory result showed anemia (Hb:8,7), leucocytosis (WBC:22,7), and thrombocytopenia (PLT:70000), hypoalbumin (Alb:2,3). Bleeding time and clotting time were normal. Postoperative studies showed anemia (Hb:8,0 g/dl), leucocytosis (WBC:15,1), normal platelet count. Gentamycin 80 mg iv twice daily and whole blood transfusion 1 bag 350 ml were added to the therapy.

Postoperative laboratory studies on 14th day showed anemia (Hb:9,9 g/dl), leucocytosis (WBC:21,4), mild thrombocytosis (PLT:466000/ul), increase in coagulation studies (aPTT 43,5s, PT 26,2 s, INR 2,23). The patient was discharged on 19th day. He was treated orally with cilostazol 100 mg twice daily, amlodipin 5 mg once daily, perindopril 5 mg once daily, micronized purified flavonoid fraction 500 mg three times a day, paracetamol 500 mg three times a day, mefenamic acid 500 mg three times a day, cefadroxil 500 mg tablet three times a day.

DISCUSSION

Acute limb ischemia (ALI) deserves special attention because: First, despite urgent revascularization with thrombolytic agents or surgery, amputation occurs in 10 to 15% patients during hospitalization, mostly above knee. Second, death and complication rates are high; approximately 15 to 20% patients die within 1 year, often from coexist predisposing conditions. Two years after a below-knee
amputation, 30% died, 15% have an above-knee amputation, 15% have a contralateral amputation, and only 40% have full mobility. Third, since atherosclerosis is a systemic disease, other diseases such as coronary artery disease and cerebrovascular disease can develop.

ALI was diagnosed in this patient based on:
1. Symptoms of swelling and stabbing pain in both calves and legs while walking and relieved when resting since 10 days before admission. Edinburgh claudication questionnaire shows positive claudication. The questionnaire is a standardized method to screen and diagnose intermittent claudication with 80-90% sensitivity and >95% specificity.
2. Risk factors: heavy smoking (>24 cigarettes/day), obese (BMI: 34.60 kg/m²), family history of cardiovascular disease.
3. Duplex sonography femoralis resulted:
   a. Occlusion in the left iliaca artery with positive collateral in the communis femoralis artery.
   b. Occlusion from left superficialis femoral artery until left posterior-anterior tibialis artery.
   c. Occlusion in poplitea artery until distal right anterior tibialis artery with positive collateral on right posterior tibialis artery.
   d. Deep vein thrombosis wasn’t found in both legs.

ALI is classified into 4 stage (Table 1).

<table>
<thead>
<tr>
<th>Grade</th>
<th>Category</th>
<th>Sensory Loss</th>
<th>Motor Deficit</th>
<th>Prognosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Viable</td>
<td>None</td>
<td>None</td>
<td>No immediate threat</td>
</tr>
<tr>
<td>IA</td>
<td>Marginally threatened</td>
<td>None or minimal (mild)</td>
<td>None</td>
<td>Salvageable if promptly treated</td>
</tr>
<tr>
<td>IB</td>
<td>Immediately threatened</td>
<td>More than</td>
<td>Mild to moderate</td>
<td>Salvageable if promptly revascularized</td>
</tr>
<tr>
<td>II</td>
<td>Inevitable</td>
<td>Profound, unbearable</td>
<td>Profound, paralytic (fingers)</td>
<td>Major tissue loss, Amputations, Persistent nerve damage inevitable</td>
</tr>
</tbody>
</table>

Acute limb ischemia is treated by endovascular or open surgical revascularization. The goal of catheter-based endovascular revascularization is to restore blood flow as rapidly as possible to viable or threatened limb with the use of drugs, mechanical devices, or both. Catheter-based thrombolysis gave a satisfactory clinical result in 75 to 92% patients with acute limb ischemia caused by occluded native vessel, stent or graft, complete or partial thrombus. High amputation rate (12%) was observed if revascularization performed during 12-24 hours. Those with a nonviable limb, bypass graft with suspected infection, or contraindication to thrombolysis (e.g. recent intravascular hemorrhage, recent major surgery, vascular brain neoplasm, active bleeding) should not undergo catheter-directed therapies. Bleeding occurs most commonly at the catheter insertion site, major hemorrhage occurs in 6 to 9%.

Thrombolysis had already been done 2 days after symptoms developed, but was not effective because of bleeding with significant hemoglobin drop and necrosis in lower extremity. Angiojet thrombectomy had also already been done to patient 2 days after symptoms developed, but less effective because the diameter of femoral artery occlusion >1 cm². Angiojet catheter is approved by Food and Drug Administrations for treatment of occlusions in peripheral arteries and can be a useful adjunct to thrombolysis.

Surgical approach include thromboembolecetmy with a balloon catheter, bypass surgery, and adjunct such as intraoperative thrombolysis. In Thrombolysis or Peripheral Artery Surgery (TOPAS) trial, rates of limb salvage and survival did not differ significantly between the thrombolysis and surgery groups, but complication rates were higher in the thrombolysis group. Catheter-directed thrombolysis has the best results in patients with a viable or marginally threatened limb, recent occlusion (no more than 2 weeks duration), with at least one identifiable distal runoff vessel. Surgical revascularization is generally preferred for patient with an immediately threatened limb or with symptoms of occlusion for more than 2 weeks. Bypass surgery presents the most common surgical approach.

Patients with extensive necrosis or infectious gangrene and who are non ambulatory may best be served with primary amputation. Secondary amputation may be performed when revascularization failed and reintervention is no longer possible or when the limb continue to deteriorate because of infection or necrosis. The goals are ischaemia pain relief, complete removal of diseased, necrotic, or infected tissue, and construction of a stump suitable for ambulation with prosthesis.

Amputation on both limbs was suggested for this patient based on:
1. Patient was presented with Rutherford criteria stage III because limb irreversibly damaged, major tissue loss and permanent nerve damage inevitable.
2. Failure of endovascular thrombolysis and angiojet thrombectomy therapy
3. Patient was presented with necrosis of both leg and were unable to be saved

Since the patient refused amputation, he was given ceftriaxone 1 gram injection twice daily, ketorolac 30 mg injection three times a day, micronized purified flavonoid fraction 500 mg tablet three times a day, cilostazol 100 mg tablet twice daily, warfarin Na 2mg once daily at night, amlodipin 5 mg tablet once daily. Ceftriaxone was given because it has broad spectrum bactericidal effect to gram positive and gram negative bacteria. Ketorolac was given to reduce the pain by inhibition of cyclooxygenase (COX) pathway. Flavonoid fraction was given to improve venous tone and lymphatic drainage, and reduces capillary hyperpermeability by protecting the microcirculation from inflammatory processes. Cilostazol was given to inhibit platelet aggregation and has a direct arterial vasodilator effect to reduce intermittent claudication. Amlodipine was given to reduce blood pressure and to reduce myocardial oxygen demand through its peripheral arterial vasodilator effect.

On the 3rd day, sepsis started to develop and amputation was agreed. Gentamicin was given because gram negative bacterial infection commonly found in leg was sensitive to this aminoglycoside antibiotic. Whole blood transfusion 1 bag 350 ml was given to this patient because low level of hemoglobin (hb:8.7 gr/dl). The second amputation was performed on 13rd day.

The patient was discharged in 19th day. He was treated with cilostazol 100 mg tablet twice daily, amlodipin 5 mg tablet once daily.
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perindopril 5 mg tablet once daily, micronized purified flavonoid fraction 500 mg tablet three times a day, paracetamol 500 mg three times a day, mefenamic acid 500 mg tablet three times a day, cefadroxil 500 mg tablet three times a day.

Perindopril was given because to cardiovascular events by 25% in patients with symptomatic peripheral arterial disease without known low ejection fraction or heart failure. Mefenamic acid was given as analgesic. Cefadroxil was given to replace intravenous cephalosporine antibiotics.

Education is important to prevent other thromboembolic event. Risk factors prevention such as weight reduction, smoking cessation are important. Leg prothesis can be applied to improve quality of life.

SUMMARY

Diagnosis of acute limb ischemia was based on anamnesis, physical examination, and support examination. Risk factors prevention, early identification, and prompt treatment are important to reduce complication.

REFERENCES