Acute Limb Ischemic

Edwin Nugroho Njoto
Fakultas Kedokteran Universitas Kristen Duta Wacana
Internship doctor in Parama Sidhi General Hospital, Singaraja, Bali

ABSTRACT

Acute limb ischemic (ALI) is defined as a sudden decrease in limb perfusion that threatens the viability of the limb. Physical finding may include an absence of pulse distal to the occlusion, cool and pale or mottled skin, reduced sensation, decreased strength and associated with ischemic stroke and myocardial infarction.

A 41-year-old man came to ER with necrosis in the left and right crus and pedis. Patient has visited national heart center “Harapan Kita” and was diagnosed with acute limb ischemia. Duplex sonography femoralis, angiojet and percutaneous intra arterial thrombolysis were done 2 days after the patient’s experienced symptoms. On the 3rd day after hospital admission he had the first amputation. On the 13th day after hospital admission he had the second amputation. On the 19th day of admission, patient was out of hospital.

Keyword: acute limb ischemic, necrotic, amputation

INTRODUCTION

The incidence of ALI is approximately 1,5 cases per 10,000 persons per year. Clinical events that cause ALI include acute thrombosis of a limb artery or bypass graft, embolism from the heart or a diseased artery, dissection, and trauma. (from severing of an artery or thrombosis). The clinical presentation is considered to be acute if it occurs within 2 weeks after symptom onset. The rapid onset of limb ischemia results from a sudden cessation of blood supply and nutrients to the metabolic active tissues of the limb, including skin, muscle, and nerves.1,2

Acute limb ischemic is induced by atherosclerosis may threat viability of limbs. Damaged viability of limbs may cause necrosis.1 Necrosis was one of the complications that can be happened. Here we report a male patient with necrosis due to acute limb ischemic.

CASE PRESENTATION

A 41-years-old male came to ER complaining of swelling and pain in both calves and legs since 10 days before admission to hospital. Stabbing pain was felt in the upper tip of the calves. Pain was felt when patient was walking and relieved when resting. In the beginning the pain was only felt like a muscleache but then it got worse as the day goes on and was accompanied by swelling. Edinburgh claudication questionnaire result shows positive claudication. Patient was a heavy smoker (>2 packs/day). History of previous operation was denied. Patient’s Body Mass Index (BMI) was 34,60 kg/m2. His elder brother had a heart failure. Patient had already visited National
Heart Center Harapan Kita to do duplex sonography femoralis, arterography, angiojet and percutaneous intra arterial thrombolysis 2 days after he began experiencing symptoms. But there was bleeding with significant decrease in hemoglobin and the lower extremity started to necrosis, so the thrombolytic was stopped. Echocardiography was done in national heart center with result LV septal hypertrophy, normal systolic and diastolic function, normal valve, and no thrombus. Electrocardiography couldn’t be done due to necrosis on both legs and calves. From national heart center, he was given irbersatan 300 mg once daily, fibrat once daily, alprazolam 0.5 mg once daily, laxadine 3 times daily, pantoprazole twice daily, ceftriaxone 2 gram once daily, tramadol drip in ringer lactat 20 drop/minute, amlodipine 100 mg 3 times daily, clopidogrel 75 mg once daily, paracetamol 500 mg 3 times daily.

On physical examination, he was noted to have a normal blood pressure (on antihypertensive drug from National Heart Center Harapan Kita), normal heart rate, normal respiratory rate, and slightly increased body temperature. Head and neck exam was clear. Cardiovascular exam was normal. Lungs were clear, and abdominal exam was normal. Left pedis examination revealed necrotic tissue above the knee, pus in the digit I-V, blood, and no sensory sensation. Right pedis examination revealed necrotic tissue below knee, oedema and bulla, and no sensation below knee. Laboratory studies showed anemia (Hb: 10), leukocitosis (WBC: 16,8), slight increase of BUN (BUN: 60), and high level of transaminase (AST/ALT: 200/273). Trombosit, creatinine, random blood glucose and lipid profile were normal. On admission, the doctor suggested amputation above knee on both legs but the patient refused. He was treated with ceftriaxone twice daily, ketorolac three times a day, flavonoid fraction three times a day, cilostazol twice daily, warfarin once daily, amlodipin 5 mg once daily.

On 3rd day of admission patient agreed to have first amputation on the left limb. On physical examination he was takikardia (112 bpm), regul lar takipneu (24 bpm), and febris (39 C). Laboratory result showed anemia (Hb: 8,7), leucocitosis (WBC: 22,7), and low platelet (PLT: 70000), hipoalbumin (2,3). Bleeding time and clotting time were normal. Gentamicin twice daily, whole blood transfusion 1 bag were added to his treatment. On 13rd day of admission the second amputation was performed. Laboratory result showed anemia (Hb: 8,4), leucocitosis (WBC: 11,1), increase trombosit (PLT 494000). On 14th day of admission, postoperation laboratory studies showed anemia (Hb: 9,9), leucocitosis (WBC: 21,4), increase thrombosit (PLT: 466000), increase in coagulation studies (aPTT 43,5s, PT 26,2 s, INR 2,23).

On 19th day of admission, patient was out of hospital. He was treated with cilostazol twice daily, Amlodipin 5 mg once daily, Perindopril 5 mg once daily, Flavonoid fraction 500 mg three times a day, paracetamol 500 mg three times a day, mefenamic acid three times a day, cefadroxil three times a day.

DISCUSSION

In this report, the writer presented a case of acute limb ischemia. Patients with atherosclerosis risk factors deserve special attention regarding their status for several reasons. First, Despite urgent revascularization with thrombolytic agents or surgery, amputation occurs in 10% to 15% of patients during hospitalization. A majority of amputations are above the knee. Second, rates of death and complications among patients who present with acute limb ischemia are high. Approximately 15% to 20% of patients die within 1 year after presentation, often from coexisting conditions that predisposed them to acute limb ischemia. Two years following a below knee amputation, 30% are dead, 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 disease can developed such as coronary artery disease and cerebrovascular disease.

In this patient, ALI was diagnosed based on: 1. Symptoms were swelling and stabbing pain
CASE REPORT

Figure 1 Duplex sonography femoralis vein

Figure 2 Duplex sonography femoralis artery

Figure 3 Duplex sonography femoralis
in both calves and legs, felt when walking and relieved when resting since 10 days before admission to hospital. Edinburgh Claudication questionnaire shows positive claudication. Edinburgh Claudication questionnaire is a standardized method to screen and diagnose intermittent claudication with 80%-90% sensitivity and > 95% specificity. 

2. Risk factor in this patient were heavy smoker (> 2 packs/day), obesity (BMI: 34.60 kg/m2), family history of cardiovascular disease.

3. Duplex sonography femoralis result shows that:
   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.

Angiojet and thrombolysis had already been done to patient 2 days after patient experience the symptoms. Angiojet catheter is approved by Food and Drug Administrations for treatment of occlusions in peripheral arteries. Angiojet thrombectomy catheter can be a useful adjunct to thrombolysis. Angiojet catheter is less effective in this patient because diameter of femoral artery occlusion > 1 cm. Endovascular therapy with thrombolysis is not effective in this patient because of bleeding with significant decrease in hemoglobin and the lower extremity started to necrosis.

From Rutherford classification, ALI is divided to 3 stages:

1. Stage I: Limb viable and not immediately threatened
2. Stage II: Limb threatened
   a. Stage IIa: Marginally threatened, salvageable if promptly treated.
   b. Stage IIb: Immediately threatened, salvageable with immediate revascularization
3. Stage III: Limb irreversibly damaged, major tissue loss or permanent nerve damage inevitable.

Due to his condition with necrosis cruris with Rutherford criteria stage III when the patient came to writer’s hospital, the patient was suggested to have amputation on both limbs. But he refused. Patient was given ceftriaxon twice daily, ketorolac three times a day, flavonoid fraction three times a day, cilostazol twice daily, warfarin once daily.

Ceftriaxon was given to this patient because this third generation of cephalosporins has broad spectrum effect to gram positive and gram negative bacteria and its bactericidal effect. Ketorolac was given to this patient to reduce the pain by inhibition of cyclooxygenase (COX) pathway. Flavonoid fraction was given to this patient because flavonoid fraction improves venous tone and lymphatic drainage, and reduces capillary hyperpermeability by
protecting the microcirculation from inflammatory processes. Cilostazol was given to this patient because this phosphodiesterase-3 inhibitor inhibits platelet aggregation and is a direct arterial vasodilator so it can reduce leg pain caused by poor circulation (intermittent claudication). Amlodipine was given to this patient to reduce blood pressure and for its peripheral arterial vasodilator effect to reduce myocardial oxygen demand.

On the 3rd day of admission, patient started to develop sepsis as such patient agreed to do amputation. Gentamicin and whole blood transfusion was added to patient’s treatment. Gentamicin was given to this patient because gram negative bacterial infection was commonly found in leg and this aminoglycoside antibiotics sensitive to negative gram organism. Whole blood transfusion 1 bag was given to this patient because low level of haemoglobin (hb: 8.7 gr/dl).

On 13th day of admission the second amputation was performed.

On 19th day of admission, patient was out of hospital. He was treated with cilostazol twice daily, Amlodipin 5 mg once daily, Perindopril 5 mg once daily, Flavonoid fraction 500 mg three times a day, paracetamol 500 mg three times a day, mafenamic acid three times a day, cefadroxil three times a day.

Perindopril was given to this patient because this ace inhibitor will reduced cardiovascular events by 25% in patients with symptomatic peripheral arterial disease without known low ejection fraction or heart failure. Mafenamic acid was given as analgetic drug. Cefadroxil was given to this patient to replace cephalosporine antibiotic from intravenous to oral drug.

Educate patient is important to prevent other thromboembolic disease in this patient. Risk factors prevention such as reduce body weight, smoking cessation are important. Leg prosthesis can be used in this patient to improve quality of life.

**SUMMARY**

Diagnosis acute limb ischemic based on anamnesis, physical examination, and supporting examination like doppler sonography. Risk factor prevention, early identification, and prompt treatment of acute limb ischemic are important to reduce complication.

**REFERENCES**