



Management of Acute Limb Ischemia in the Emergency Department

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Editorial

Acute limb ischemia (ALI) is an emergency condition caused by the sudden occlusion of an artery. The tissue perfusion is compromised and the viability of the limb is threatened. The etiology of acute limb ischemia may be acute thrombosis, an embolic event or trauma. Sometimes, it appears when thrombosis occurs on a pre-existing atheroma (so called "acute on chronic disease"). Most commonly, thrombosis is located in common femoral artery, popliteal artery or bypass grafts. During the last decades, iatrogenesis has become a more common cause of ALI, secondary to increased number of endovascular interventions. Embolic occlusion may be from cardiac source (valves, mural thrombus) or noncardiac source (thrombosed aneurysm, ulcerated atherosclerotic plaque). Embolic occlusion appears frequently at femoral artery bifurcation or aortoiliac arterial system. Less common etiologies of acute limb ischemia are extrinsic compression of arterial lumen, vasospasm, vasculitis or low intravascular volume ± mild peripheral vascular disease [1].

ALI is a big emergency, in which "time is limb" and the specific treatment should be promptly initiated. The golden time window is six hours, before the appearance of irreversible muscular damage. A few hours can make the difference between amputation or death and salvage of the affected limb. When a patient is suspected to have acute limb ischemia, the case should be immediately discussed with the vascular surgeon. If no contraindications exist (such as acute aortic dissection, head trauma, multiple trauma), in the emergency department a bolus of heparin should be administered, in order to stop the propagation of the thrombus. When ischemia is complete, the patient should go directly to the operating room; angiography in this case will only delay the therapeutic intervention. If ischemia is incomplete, a preoperative angiography should be done, since embolectomy or thrombectomy is unlikely to be successful in this case. In acute embolic occlusion the leg is always threatened and requires immediate surgical revascularization [2].

The treatment options in patients with ALI include three modalities: medical treatment, percutaneous endovascular techniques and surgery. Medical treatment consists on anticoagulant therapy with oral anticoagulants such as warfarin, in patients which are not candidates for revascularization from different reasons. After embolectomy, anticoagulation is usually required, the duration of treatment depending on the etiology of acute ischemia. In patients with unknown embolic site, anticoagulation is required for one year. Thrombophilic patients with ALI require long-term anticoagulation, sometimes all lifelong [3].

Percutaneous endovascular techniques are catheter-directed thrombolysis and mechanical thrombectomy. The minimally invasive percutaneous techniques for thrombotic ALI are performed in a cath-

lab, under local anesthesia, in patients with Rutherford IIa ischemia. Patients with Rutherford IIb ischemia need immediate surgical revascularization. The endovascular interventions have the best results in the femuro-popliteal segment and in the thrombosed vascular grafts or thrombosed stents (compared to thrombosed native arteries). Catheter-directed thrombolysis is a technique that uses thrombolytic agents (plasminogen activators). The adequate case selection for this procedure is very important, due to the risk of local or remote hemorrhagic complications. Percutaneous mechanical thrombectomy is another procedure, that uses aspiration catheters to aspirate thrombus, with or without the use of thrombolytic agents; distal embolisation and haemolysis may appear as complications [4].

Surgical interventions for the treatment of ALI may consist of transfemoral embolectomy or thrombectomy, intraoperative thrombolysis, intraoperative angioplasty and/or stenting, vascular bypass procedures, endarterectomy or combined procedures. Transfemoral embolectomy is performed under local, regional or general anaesthesia, using a Fogarty balloon catheter.

The most used surgical revascularisation techniques are balloon catheter embolectomy, transluminal thrombectomy, vascular bypass procedures, endarterectomy, intraoperative thrombolysis and combined procedures.

The degree of limb ischemia at presentation and associated comorbidities are predictive for the success of surgical revascularization. One of the major complications in revascularized patients is reperfusion injury that may produce myoglobinuria and acute renal failure.

In conclusion, the rapidity of the diagnosis in the Emergency Department is crucial for the evolution of patients with ALI. In case of suspicion, the vascular surgeon should be asked for evaluation of these patients. Immediate heparinisation may improve the survival, by preventing thrombus propagation. The modality of revascularization is patient specific and depends on a multitude of factors.

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