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Epidemiological and Therapeutic Aspects of Acute Non-Traumatic Lower Limb Ischemia: A Retrospective Analysis of 50 Cases

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Abstract

Acute non-traumatic ischemia of the lower limbs (ANLLI) remains a critical vascular emergency with a high risk of amputation and mortality if not diagnosed and treated promptly. The objective of this study was to analyze the epidemiological, clinical, and therapeutic aspects of ANLLI and to assess the outcomes of surgical and endovascular management in our institution. We conducted a retrospective analysis of 50 patients admitted for ANLLI at the Military Hospital of Marrakech between January 2018 and February 2022. Demographic characteristics, risk factors, clinical presentations, management strategies, and postoperative outcomes were collected and analyzed. The average age was 52 years (range 25–94), with a predominance of females (80%). Diabetes (78%), hypertension (40%), and smoking (30%) were the most common cardiovascular risk factors. Pain was the initial symptom in all cases, while pallor (84%), coldness (80%), paresthesia (30%), and paralysis (14%) were also observed. The left limb was more frequently affected (52%). All patients received initial anticoagulation, followed by surgical or endovascular intervention: embolectomy (60%), thrombectomy (20%), bypass (12%), and thrombolysis (8%). Postoperative complications occurred in 26% of cases, with an amputation rate of 10% and mortality rate of 1%. These results underline the necessity of early diagnosis, prompt revascularization, and rigorous postoperative monitoring to improve limb salvage and survival outcomes.

Keywords: Acute ischemia; Lower limb; Non-traumatic; Embolectomy; Thrombectomy; Thrombolysis; Vascular surgery; Epidemiology

1. Introduction

Acute limb ischemia (ALI) is defined as a sudden decrease in arterial perfusion to a limb, causing a potential threat to limb viability. If left untreated, it can result in irreversible tissue necrosis, leading to amputation or death. It is estimated to occur in 14 to 20 cases per 100,000 persons per year, representing approximately 15–20% of all surgical vascular emergencies. Although its incidence is relatively low compared to chronic peripheral arterial disease, its prognosis is often worse because of the rapid onset and limited time for intervention. Etiologically, ALI can result from embolism, thrombosis, or occlusion of a bypass graft. Embolic events are commonly of cardiac origin, often due to atrial fibrillation or valvular disease, while thrombotic occlusions typically occur on pre-existing atherosclerotic lesions. In resource-limited settings, delays in presentation, limited diagnostic tools, and comorbidities such as diabetes and hypertension complicate management. The aim of this study is to describe the epidemiological, clinical, and therapeutic characteristics of 50 patients treated for ANLLI at the Military Hospital of Marrakech, and to discuss the outcomes in light of the current literature.

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2. Materials and Methods

This was a retrospective descriptive study conducted at the Vascular Surgery Department of the Military Hospital of Marrakech, Morocco. It included all patients admitted for acute non-traumatic ischemia of the lower limbs between January 2018 and February 2022. Inclusion criteria consisted of patients presenting with sudden onset of pain and loss of distal pulses within 14 days, confirmed by Doppler ultrasound or computed tomography (CT) angiography. Patients with traumatic arterial lesions, chronic ischemia, or incomplete records were excluded. A standardized data collection sheet was used to record patient demographics, risk factors, comorbidities, clinical features, time from symptom onset to hospital presentation, diagnostic methods, treatment modality, and outcomes. The severity of ischemia was classified according to the Rutherford classification, ranging from category I (viable limb) to category III (irreversible ischemia). (1) All patients received initial systemic anticoagulation with intravenous unfractionated heparin (5000 IU bolus followed by infusion), aiming to prevent thrombus propagation. The decision between surgical and endovascular treatment was based on clinical stage, duration of symptoms, and imaging findings. Surgical procedures included embolectomy or thrombectomy using a Fogarty catheter, and bypass surgery when revascularization by simple embolectomy was not possible. (3) Thrombolysis was performed in selected cases using intra-arterial infusion of alteplase for patients presenting within 12 hours of symptom onset. Postoperative follow-up included clinical evaluation, limb perfusion monitoring, and assessment of complications such as re-thrombosis, infection, or compartment syndrome. Data were analyzed descriptively using Microsoft Excel. Quantitative variables were expressed as means, and qualitative variables as percentages.

3. Results

The study population consisted of 50 patients, including 40 women (80%) and 10 men (20%), with a mean age of 52 years (range 25–94). Cardiovascular risk factors were frequent: diabetes mellitus in 39 patients (78%), hypertension in 20 (40%), smoking in 15 (30%), and atrial fibrillation in 9 (18%). A history of ischemic heart disease was present in 12% of cases. The median time from onset of symptoms to hospital admission was 14 hours, with extremes of 4 and 48 hours. The main presenting symptoms were intense pain (100%), pallor (84%), coldness (80%), paresthesia (30%), and paralysis (14%). Gangrene was already established in 8 patients (16%) at presentation. The left lower limb was affected in 52% of cases, the right in 32%, and both in 16%.

Figure 1 CT angiogram showing bilateral popliteal artery occlusion

Doppler ultrasound confirmed the diagnosis in all cases, and CT angiography identified the level of occlusion in 44 patients (88%), most commonly in the femoral (60%) and popliteal (20%) arteries. Based on Rutherford classification, 20 patients (40%) were classified as category IIa, 22 (44%) as IIb, and 8 (16%) as III. All patients received intravenous heparin upon admission. Embolectomy using a Fogarty catheter was the most frequent procedure (30 patients, 60%), followed by thrombectomy (10 patients, 20%), bypass grafting (6 patients, 12%), and intra-arterial thrombolysis (4 patients, 8%).

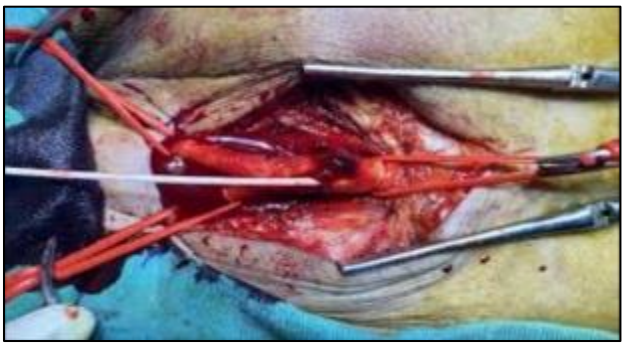

Figure 2 Embolectomy using a Fogarty catheter

Postoperative complications occurred in 13 patients (26%), primarily infection (10%), re-thrombosis (6%), and compartment syndrome (4%). Fasciotomy was required in three patients. Five patients (10%) underwent major amputation due to irreversible ischemia, and mortality was recorded in 1% of cases, mostly from sepsis or multi-organ failure.

4. Discussion

This study confirms that acute non-traumatic lower limb ischemia remains a severe vascular emergency associated with significant morbidity and mortality. The predominance of female patients in our series differs from most Western studies, where men are more frequently affected. This may reflect regional variations in risk factor distribution and healthcare-seeking behavior. The mean age of 52 years aligns with data from North African series but is slightly younger than the 65–70 years reported in European studies, suggesting a demographic difference.(7)

Diabetes and hypertension were the most common risk factors in our cohort, highlighting their central role in the pathophysiology of arterial occlusion. Uncontrolled diabetes leads to endothelial dysfunction, accelerated atherosclerosis, and increased blood viscosity, all predisposing to thrombotic events. Similarly, hypertension contributes to arterial wall damage and plaque rupture. The role of atrial fibrillation in embolic ischemia remains well established, underscoring the importance of anticoagulation in cardiac patients.(2)

The high rate of delayed presentation (median 14 hours) significantly influenced outcomes. According to the literature, irreversible muscle necrosis begins after 6 hours of complete ischemia. In our context, the lack of public awareness and delays in referral from peripheral hospitals contribute to advanced ischemic stages at admission. Early recognition of the six classic clinical signs (pain, pallor, pulselessness, paresthesia, paralysis, poikilothermia) remains essential. Surgical embolectomy remains the gold standard in most cases because of its availability, rapidity, and effectiveness(6). Endovascular therapy, such as catheter-directed thrombolysis and mechanical thrombectomy, provides a less invasive option, particularly for distal occlusions or patients at high surgical risk(5). However, access to such technology requires a good platform. Our amputation rate (10%) compares favorably with international averages (10–15%), whereas our mortality rate (1%) remains slightly lower than the 10–12% reported in other series. (2)This difference may be attributed to the higher proportion of advanced ischemia (Rutherford IIb–III) and comorbidities in our population. Postoperative complications such as infection, re-thrombosis, and compartment syndrome are major determinants of outcome.(4) Prompt recognition and management of these complications, along with adequate postoperative anticoagulation, are essential for limb salvage. Long-term follow-up focusing on risk factor control, antiplatelet therapy, and rehabilitation is vital to prevent recurrence.

5. Conclusion

Acute non-traumatic ischemia of the lower limbs is a medical and surgical emergency requiring early diagnosis and multidisciplinary management. Immediate anticoagulation and timely revascularization are crucial to improving prognosis. Delays in diagnosis and treatment remain the main contributors to limb loss and mortality. Our findings emphasize the need for improved public education, better pre-hospital triage, and the development of vascular care networks to facilitate early referral. Preventive strategies aimed at controlling diabetes, hypertension, and cardiac arrhythmias are equally essential. Future prospective studies including larger patient populations and evaluating long-term outcomes will be valuable to optimize management protocols and improve survival.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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