Acta Scientific Clinical Case Reports

Volume 3 Issue 2 February 2022

Case Study

Acute Limb Ischemia in India - Late Decision, Limb Lost? - A Case Study

Ashwini P Kudlekar* and K Suresh

Public Health and Environmental Health, Karnataka State Rural Development and Panchayat Raj University (KSRDPRU), GADAG, Karnataka, India

***Corresponding Author:** Ashwini P Kudlekar, Masters of Public Health (MPH), Karnataka State Rural Development and Panchayat Raj University (KSRDPRU), GADAG, Karnataka, India.

Received: January 09, 2022

Published: January 28, 2022

Abstract

Acute limb ischaemia is a potentially fatal condition. Smoking is a one of the risk factors for poorer outcomes. Peripheral artery disease (PAD) is the commonest cause for Critical limb ischemia. Early reaching to the emergency and early administration of heparin is associated with lower amputation rates. The incidence of critical limb ischemia was 22 per 100,000 people per year in Oxford, England and an Indian study reported it to be 380 per 100,000 in mid-2000 AD. The exponential increase in diabetes in India has led to serious raise in PAD/CLTI.

The diagnosis is based on physical exam as the first step including a bilateral comparison of temperature changes along the affected extremity. When a deficient pulse is detected, a complete bilateral pulse exam should be performed, muscle strength and sensation testing should be performed. The traditional 6 P's (pain, paraesthesia, pallor, pulselessness, poikilothermic, and a perishingly cold limb) are not clinically reliable because they may manifest only in the late stages, by which time extensive and irreversible soft tissue damage has occurred. Arterial Doppler examination will help in identifying occlusion, that need to be confirmed with Computed Tomography Angiography (CTA).

Though Coronavirus disease-2019 (COVID-19) disease is very rarely associated with arterial thrombosis in a patient already on therapeutic anticoagulation, it is distinguished by a higher thrombus burden and a higher rate of amputation and death.

Though men and women are affected equally, smokers, Diabetics, Covid 19 patients or those on heparin treatment are at higher risk of PAD. I report a case in a lady with none of such precipitating conditions.

Keywords: Peripheral Artery Diseases (PAD); Acute Limb Ischaemia; Arterial Occlusion; Critical Limb; Diabetes; Smoking; Infarction; Cardio-Vascular Events; Atherosclerotic Burden; Venous and Arterial Doppler Studies

Introduction

Acute arterial occlusion, also known as acute limb ischemia, is a life-threatening vascular condition. Acute limb ischemia is defined as a sudden loss of limb perfusion that lasts up to two weeks following the triggering event and affects any peripheral artery in the upper or lower extremities. Acute arterial occlusion is a time-sensitive condition, if not treated in time can quickly lead to gangrene and loss of limb or life-threatening infarction. The affected artery and the patient's medical history determine diagnostic procedures, treatment, and management. Acute arterial occlusion is associated with increased morbidity, significant disability, and emergent surgery in high-risk patients [1,2].

The key clinical features of acute ischemia include the six Ps pain, pallor, poikilothermia, pulselessness, paraesthesia, and paralysis. Pain associated with acute arterial occlusion is typically located distally in the extremity, gradually worsens, and progresses proximally as the duration of ischemia increases.

Coronavirus disease-2019 (COVID-19) disease is often complicated by venous thrombosis and embolism and very rarely arterial thrombosis in a patient already on therapeutic anticoagulation. Lower-extremity arterial thrombosis caused by covid-19 has a higher thrombus burden as well as a higher rate of amputation and death [3].

Aetiology

Acute limb ischaemia is a life-threatening condition. Tobacco use is a risk factor that has been linked to poorer outcomes. Peripheral artery disease is the most common cause of in situ thrombotic occlusion leading to acute limb ischemia (PAD). It is the most common in the lower extremities any segment of the upper and lower extremities may be affected. The superficial femoral artery is the most affected [1,4].

Epidemiology

The incidence of critical limb ischemia was determined to be 22 per 100,000 people per year in a prospective population-based study conducted in Oxford, England over a 10-year period. Acute limb ischemia affects both men and women in equal numbers, with a median age of 75. Age, smoking, obesity, sedentary lifestyle, diabetes, family history of vascular disease, high cholesterol, and high blood pressure are all risk factors. Lower extremity non-traumatic ischemia was more common than upper extremity ischemia and resulted in limb loss.

An Indian retrospective study of 84 patients admitted to a tertiary care centre in India from January 1998 to December 2007 showed the mean age of the patients was 48.9 years. Only one patient died, and 24 patients had an amputation (28.6%) [1]. Among the predisposing risk factors, smoking was found to have a significant association with the rate of amputation. Early presentation to the emergency department and early heparin administration were associated with lower amputation rates, though this did not reach statistical significance. In another study PVD in the entire population was reported to be 380 per 100,000. There is very little public awareness about vascular diseases – a "leg attack" does not elicit the same level of concern as "chest pain/heart attack," despite the fact that it may be equally dangerous, according to the report [3]. Failure to diagnose properly is not covered in the education curriculum. Incomplete examination of the patient should be included in training – pedal pulses are rarely examined in a patient with leg pain. Hence many, are referred to nonvascular surgeons, leading to gross undertreatment. There is a severe underestimation of the disease's local and systemic impact, and several therapies that are ineffective or even harmful are still used. The most serious reason is that the patient cannot afford it [7].

Evaluation

The physical examination is the first step in determining the acute arterial occlusion. A thorough physical examination should include a bilateral comparison to look for changes in temperature along the affected extremity. When a deficient pulse is detected, a complete bilateral pulse exam should be performed, beginning with manual palpation, and progressing to an arterial Doppler exam. Muscle strength and sensation tests should also be performed. When an occlusion is suspected, confirmatory testing with a CT angiogram (CTA) is typically performed because it is faster and more easily accessible. The average time to order, perform, and interpret imaging, on the other hand, must be balanced against the need for immediate treatment to save life and limb. Because The majority of cases of acute limb ischemia present to the emergency department, necessitating an immediate vascular surgery consult. The physical examination itself can be used to determine the severity of ischemia with the use of Rutherford Classification of Acute Limb Ischemia. It is also not that easy to identify the cause of the occlusion. A patient with a history of atrial fibrillation who develops sudden symptoms, for example, is more likely to have an embolic occlusion than a patient with a history of PAD and claudication who is more likely to have a thrombotic source [1,5,6].

Management/Treatment

Cases of limb-threatening ischemia necessitate an urgent consultation with a vascular surgeon. Irreversible damage of the body tissue leads to condition like amputation. The intense paralysis with absent pain, inaudible arterial and venous pulses are the conditions makes irreversible damage. In our case within 3 days of emergent of the symptoms the problem turned in to irreversible condition and the individual lost her limb. The best surgical approach is aimed at reviving the affected extremity if seen early. The surgical bypass, endarterectomy, or embolectomy can all be used to accomplish this. The outcome will vary and will finally be determined by the duration of the ischemia and the extent of the occlusion. Catheter-directed thrombolysis (CDT) performed by an interventional radiologist is becoming the most common, and it

is reserved for patients who have a salvageable limb according to Rutherford class II, II a, and II b. To minimise thrombus propagation during the patient's surgical or interventional radiology evaluation, initial therapy should be started including fluid resuscitation, pain management, and administration of unfractionated heparin. The overall goal of anticoagulation is to raise partial thromboplastin levels by a factor of 2.0 to 2.5 above baseline. Close and frequent monitoring is required after revascularization. Ischemia that lasts longer than 4 hours increases the risk of compartment syndrome and must be monitored with hourly neurovascular checks [7-9].

Case Presentation

A 40 yrs. old housewife visited a private hospital on 13/9/2020 with the complaints of high fever, tingling sensation and disabling claudication pain in right leg for 6 months. 'MRI of lumbosacral spine' intervertebral disk, found Broad posterior disc protrusion at L4-L5 level causing indentation on thecal sac with mild narrowing of spinal canal and bilateral neural foramen (Left >Right), compressing bilateral traversing and exiting nerve roots.

On 16/09/2020 the patient returned to hospital with worsened symptoms of severe pain in right leg, discolouration of leg for 3 days, loss of sensation of right foot for 2 days. The discoloration of right foot had extended up to mid leg with loss of sensation and numbness up to the right ankle (Figure 1 and 2).

Figure 1: Discolouration of Right lower limb compared with left.

Figure 2: Discoloured right limb on 16/09/20.

On physical examination pedal pulse was absent in the right leg and the BP was 130/70mmHg, pulse was 100 beats/minute. The lady did not show any symptoms of COVID-19 on the time of examination or in the recent past. She was a non-smoker and non-diabetic.

Examination and Results

Haematological finding

Test name	Results	Units	Normal range
HAEMOGLOBIN	11.6	Gms%	11.0-16.0
Bleeding time	2-00	-	1-5
Clotting time	4-00	-	3-8
HIV 1 and 2	Non-reactive		
HbsAg	Negative		
Blood urea	24.6	Mgs/dl	15-45
Serum creatinine	0.83	Mgs/dl	0.6-1.2
Random blood sugar	133.9	Mg/dl	80-140

Table 1

Right lower limb venous doppler study

Reveals no evidence of deep vein thrombosis or saphenous-femoral incompetence and saphenol-popliteal junction is competent.

Figure 3

Right lower limb arterial doppler study

Showed long segment thrombotic occlusion of right common femoral artery, superficial femoral artery and popliteal artery extending cranially up to external iliac artery, with absent of flow. The common iliac and lumbar aorta showed no thrombosis/occlusions and suggested CT angiogram.

Confirmed with absent flow of Distal calf arteries

ATA and PTA due to the arterial thrombosis. And suggested for the above knee amputation surgery.

On 16th September 2020, above knee amputation done on the lady and got discharged on 23rd without any complaints.

Follow-up on 25/09/2020, ECOSPRIN AV 75/20 (1-0-0 for 10 days), PAN-40 (1-0-1 for 5 days BM), ACITROM 2 mg (1-0-0 for 10 days, CIVID 600mg (1-0-0 for 5 days), ULTRACET (1-0-0 for 5 days) and suggested review SOS after 5 days.

Now presently the lady is living with prosthetic limb which is used after a month of follow up. And told to visit the hospital rehabilitation centre for every 15 days till two months till she get comfort with the prosthesis. Now she is fine with the prosthetic as per the follow up on 30/12/2021.

Discussions

Amputation is not cheaper than the limb salvage! The lifetime cost of amputees is three times that of those whose limbs are rescued [3].

Figure 4

Coronavirus infection in the year 2019 (COVID-19), although venous thrombosis and embolism are common complications of the disease, arterial thrombosis in a patient already on therapeutic anticoagulation is uncommon [10]. Two such cases i) thrombosis of the radial artery, resulting in ischemia of the fingers and lateral palm. ii) In another case, thrombosis was found in the anterior tibial artery, resulting in ischemia of the limb and it leads to an amputation. Both of these patients were taking a low-molecular-weight heparin in the therapeutic dose. Heparin infusions were started in both cases, but with little benefit.

That the PAD both symptomatic and non-symptomatic will reflect the global atherosclerotic burden and predictor of future cardiovascular (CV) accidents for that patient more than any other system is rarely recognized. The prevalence rate of atherosclerosis in the coronary, carotid, and renal arteries is higher in patients with PAD when compared to without PAD [11].

The extreme rise in diabetes or hyper-glycaemic conditions in India has resulted in a noticeable increase in PAD/CLTII 1908, Sir William Osler identified “gangrene” as a scourge. Although the number of diabetic coma deaths has decreased, the number of deaths from foot and leg gangrene has increased significantly. More research into gangrene and the causes of arteriosclerosis is needed. Gangrene is caused by an external injury caused by barefoot walking and minor foot procedures without any vascular evaluation, followed by a delayed referral to a vascular surgeon, which results in a serious threat to limb and life.

Exact data on LEA occurrences in diabetic and non-diabetic individuals is critical for improving diabetic foot care, avoiding fatal outcomes, and providing a strong foundation for health policy and the economy. Lower extremity amputation (LEA) in diabetic individuals has been linked to a higher mortality rate, a lower quality of life, and higher medical costs. Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) criteria were used in a study. The analysis comprised 19 out of 1582 studies. The incidence of LEA in diabetes individuals ranged from 78 to 704 per 100,000 person-years, with relative risks between diabetic and non-diabetic patients ranging from 7.4 to 41.3. In certain studies, the incidence of LEA as well as relative risks decreased over time.

A case study done to study to compare the reproductive histories of women with lower limb ischemia to a control group of

women to find reproductive factors that may contribute to the development of arteriosclerosis in the leg arteries. They have taken 2 groups. Age at menopause and menarche, pregnancies, salpingo-oophorectomies, and hormone replacement therapy were all identical in the two groups. The reference group had a greater percentage of women who had used oral contraceptives than the patient group (53 percent versus 16 percent, p 0.001). When a subgroup of patients younger than 55 years old was compared to the references, the same results were found [12]. There was no link established between reproductive history and the development of lower limb ischemia. Their findings show that early usage of oral contraceptives is not linked to an increased risk of lower limb ischemia. As in the case the lady is still in non-menopausal stage which has no effect on the present case situation.

Conclusion

The acute arterial occlusion or the acute limb ischaemia is the emergency which may go till the loss of the limb or strokes. Acute limb ischemia affects both men and women in equal numbers, with a median age of 75. Risk factors include age, smoking, diabetes, obesity, sedentary lifestyle, family history of vascular disease, hyperlipidaemia, and hypertension. Here in this case a 40-year lady who is a housewife has faced the problem of mild leg pain for 1 year and neglected the pain till it became severe and intolerable with the symptoms of pain, numbness, tingling sensation, difficult claudication. On her first consultation it was diagnosed as Broad posterior disc protrusion at L4-L5 level causing indentation on the cal sac with mild narrowing of spinal canal and bilateral neural foramen (Left > Right), compressing bilateral traversing and exiting nerve roots. After worsening and complete discolouration of limb happened, she rushed to the hospital, but it was late. On physical examination the right lower limb was extremely cold and there was bilateral absence of pedal pulse, BP was 130/70 and pulse rate of 100. Right lower limb venous doppler study, and Arterial Doppler study confirmed arterial thrombosis with absent blood flow of distal calf arteries. CTA clinched that ATA and PTA was due to the arterial thrombosis. As there was no way to salvage the limb above knee amputation was performed to save the life of the lady.

In this case within 3 days of emergent of the symptoms the problem turned in to irreversible condition and the individual lost her limb. Early diagnosis and management could save a limb.

Lessons learnt

- The acute arterial occlusion or the acute limb ischaemia is the emergency which may quickly lead to the loss of the limb
- Limb-threatening ischemia necessitate an urgent consultation with a vascular surgeon.
- Failure of proper diagnosis is because of this is NOT in the teaching curriculum.
- The identification and diagnosis play an important role in identifying the acute arterial thrombosis to salvage the affected limb or the lives.
- The basic awareness about the thrombotic incidence is needed in the community to lead a productive life.

Bibliography

1. Engledow AH., *et al*. "Acute lower limb ischaemia". *Hospital Medicine* 63.7 (2002): 412-415.
2. David A Smith and Craig J Lilie. "Acute Arterial Occlusion". Stat Pearls - NCBI Bookshelf (2021).
3. Goldman IA., *et al*. "Lower-extremity arterial thrombosis associated with COVID-19 is characterized by greater thrombus burden and increased rate of amputation and death". *Radiology* 297.2 (2020).
4. Ashorobi D., *et al*. "Thrombosis". *Primer on Cerebrovascular Diseases - 2nd Edition* (2021).
5. Olinic D-M., *et al*. "Acute Limb Ischemia: An Update on Diagnosis and Management". *Clinical Medicine* 8.8 (2019): 1215.
6. Walker TG. "Acute Limb Ischemia" 12 (2009).
7. Suresh K. "What Ails Diagnosis of Peripheral Arterial Disease/ Critical Limb Ischemia/Critical Limb-threatening Ischemia in India?" 4.4 (2017): 139-142.
8. Smith DA., *et al*. "Acute Arterial Occlusion". StatPearls (2021).
9. Mazda Turel., *et al*. "A 10-year experience of managing acute limb ischaemia in India". *The National Medical Journal of India* 21.6 (2008): 284-287.
10. Mandal S., *et al*. "A Case report on extensive arterial thrombosis as a complication of covid-19 infection". *Cureus* 13.6 (2021): e15378.

11. Howard DPJ., *et al*. "Population-Based Study of Incidence, Risk Factors, Outcome, and Prognosis of Ischemic Peripheral Arterial Events: Implications for Prevention". *Circulation* 132.19 (2015): 1805-1815.

12. Hultgren R., *et al*. "Reproductive history in women with lower limb ischemia". *Angiology* 55.4 (2004): 373-383.