



Postoperative Outcome and Associated Factors in patients who underwent Revascularization procedure of lower extremity Chronic limb threatening ischemia : A study in Tikur Anbessa Specialized Teaching Hospital

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Abstract

Background

Chronic limb-threatening ischemia (CLTI) is a severe impairment of limb perfusion to the level that blood flow to the limb could not be able to maintain basal metabolic function.

Revascularization of a limb is the most important management strategy to salvage a limb.

Patients are optimized preoperatively based on their demographic, comorbidity and clinical profile so that they have decreased mortality and limb loss. There is no study done in Ethiopia regarding postoperative outcome and associated factors of CLTI revascularization. So this study aimed to identify the pattern and post operative outcome of CLTI in our country and be used as a base for intervention.

Method

A retrospective study was conducted among CLTI who underwent revascularization Surgery from December 30,2020 to May 30,2024 at TASH. Patients basic data was traced from OR logbook. Using the OR logbook and patients electronic medical records, relevant data was collected using questionnaires. Demographic and clinical data of study population were analyzed using descriptive statistics. Binary Logistic regression model was applied to identify predictors of postoperative outcomes of revascularization. Statistical analysis was performed using SPSS version 25.

Results

A total of 151 patients who had revascularization procedures for CLTI were included for the final analysis. Among patients who underwent revascularization 70.9% were male and 29.1% were female. Revascularized patients data were retrieved and their follow up was analyzed 1 year after revascularization . Analysis of patients data showed 39 patients (25.8%) had major amputation with in 1 year of revascularization and all cause mortality rate was 4.6%(7 patients). Analysis of post operative outcome further showed that 1 year amputation free survival rate was 71.5% .

Conclusion

The study showed a relatively younger population compared to other studies with male to female ratio of 2.5:1. The number of smoker patients were found to be small compared to others. The rate of major amputation and amputation free survival was comparable with other studies. Patients with diabetes and Surgical site infection had a low amputation free survival compared to other patients who had no diabetes and did not develop surgical site infection.

Declaration

I hereby declare that the thesis is my original work and has not been presented for a degree in any other university. All sources of material used in the document have been duly acknowledged and properly cited.

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The undersigned have examined the thesis report entitled **“Postoperative Outcome and Associated Factors in patients who underwent Revascularization procedure of lower extremity Chronic limb threatening ischemia : A study in Tikur Anbessa Specialized Teaching Hospital”** presented by Dr. Fentahun Dires with registration number GSR 3958/16 a candidate for fellowship certificate in Vascular and Endovascular Surgery and hereby certify that it is worthy of acceptance.

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Abbreviations

ABI	Ankle Brachial Index
AFS	Amputation Free Survival
BASIL Trial	Bypass versus Angioplasty in Severe Ischemia of the Leg
BEST CLI trial	Best Endovascular versus Best Surgical Therapy chronic Limb Ischemi Trial
CLTI	Chronic Limb Threatening Ischemia
CTA	Computer Tomography Angiography
CKD	Chronic Kideny Disease
EBR	Evidence Based Revascularization
FDA	Food and Drug Administration
HICs	High Income Countries
LMICs	Low and Middle Income Counties
OR	Operation Room
PAD	Peripheral Arterial Disease
TASH	Tikur Anbessa specialized Hospital
SVS	Society of Vascular Surgery

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1. Introduction

1.1 Background

Peripheral arterial disease (PAD) is a chronic atherosclerotic disease of the lower extremity. The presentation could be as intermittent claudication, rest pain or tissue loss. Intermittent claudication is a calf pain which is induced by exercise (1). Most of patients with intermittent claudication will have a low risk of limb loss compared with patients with chronic limb threatening ischemia(2). Diagnosis of PAD is made by ankle brachial index (ABI) or absolute ankle /toe pressure measurement. Patients that have peripheral arterial disease and develop rest pain or tissue loss for more than 02 weeks are labeled to have chronic limb threatening ischemia (CLTI). Patients with CLTI usually have one or more deranged hemodynamic parameters. These hemodynamic parameters are $ABI < 0.4$, absolute ankle pressure $< 50\text{mmHg}$ or absolute toe pressure $< 30\text{mmHg}$ (3). Patients who are diagnosed with CLTI have a high risk of cardiovascular and cerebrovascular events, major amputation and wound sepsis. The aim of treatment in CLTI to relieve rest pain, heal ulcers and prevent limb loss and decrease mortality (2, 3). Studies on untreated CLTI showed about 46% of patient lost their limb and 54% patient died with 1 year of diagnosis of CLTI (4).

Peripheral arterial disease and chronic limb- threatening ischemia are chronic manifestations of systemic atherosclerosis. There are different risk factors to development of chronic limb threatening ischemia. These are advanced age, hypertension, diabetes, dyslipidemia, smoking and vessel wall inflammation. There is also a variation of the disease with different demography patterns. The anatomic distribution of the disease is variable based on the different demographic pattern and risk factors. Treatment of patients with CLTI involves risk factor modification, revascularization of a limb, prevention of cerebrovascular and cardiovascular events(3, 5, 6).

CLTI patients who have revascularization surgery is need to be followed on scheduled intervals and complications need to be detected and treated timely so that patients will have a good outcome. There are different clinical endpoints used to measure and follow the clinical effectiveness of a revascularization surgery .Those endpoints measures are amputation free survival(AFS), the presence of adverse limb events(MALE), hemodynamic parameters ,subjective clinical measures and anatomic parameters. Among those factors AFS is used as a suitable primary clinical outcome measure recommended by TASC II,FDA,UK

national health institute,SVS limb ischemia working group , BASIL and BEST CLI trial (3, 7-10). The AFS rate of CLTI patients usually evaluated at 1,2,3,5 years intervals(11).

1.2 Statement of the problem

Chronic limb-threatening ischemia is a severe impairment limb perfusion to the level that blood flow to the limb is not able to maintain basal metabolic function. Patients who present as CLTI has a 40% risk of amputation within 6 months of the symptom onset if they are not treated (3). CLTI is caused by different risk factors.

Revascularization of a limb is the most important management strategy to salvage a limb. The primary goal of this procedure is to salvage a limb. Optimizing patients pre operatively based on clinical pattern, anatomic level and comorbidity pattern of the disease is the most important strategy for successful revascularization (3, 12).

Outcomes of the procedure are measured by analyzing different endpoints of revascularization. These are amputation-free survival, anatomic patency, hemodynamic improvement and subjective improvements (3). After revascularization CLTI patients have a risk of amputation and mortality from cerebrovascular and cardiac causes . The study will evaluate MALE,MACE and amputation-free survival after revascularization and associated factors that affect this outcome in TASH.

1.3 Literature review

In 2010 worldwide over 200 million people were living with PAD. This data showed there was 23.5% increase in the disease burden compared from 2000. There are different risk factors for PAD which includes age, smoking, hypertension, diabetes, dyslipidemia and air pollution. Those factors studied extensively in high income countries but there is no much data in low and middle income countries(3).

A four year retrospective study conducted in Romania to identify on demography and comorbidity pattern of chronic limb-threatening ischemia compared with PAD. The study conducted on 686 patients with a mean age of 67 for PAD and 65 years for CLTI. From this study, the result showed a higher percentage of patients were male with 79.25% and $P < 0.0001$. Most of the patients from the study about 71.30% were smokers. There was no significant difference in comorbidity pattern between CLTI and PAD patients. Age and high blood lipid profile were associated with increased risk for CLTI(13).

Prevalence and risk factor comparison between high and middle income countries was made on 34 studies using meta -analysis in 2013. The result showed globally 202 million people live with PAD and 69.7% in LMICs. There was a 28.7% and 13.1% increase in PAD in LMICs and HICs respectively. There is a higher percentage increase of PAD in women compared men(3, 14)

Analysis of a survey on prevalence and risk factors of peripheral arterial disease in 2176 patients from USA showed a prevalence of 4.3 % over age 40 and above where as 14.5 % over the age 70 and above. On age and gender adjusted logistic regression analysis current smoking, hypertension, diabetes, hypercholesterolemia, decreased renal excretion and race/black were positively associated with prevalence of peripheral arterial disease. About 95 % of patients from the survey analysis were found to have more than 1 risk factor. High serum fibrinogen and c reactive protein level were also associated with increased risk of peripheral arterial disease(15).

Meta analysis regarding similarity and difference in peripheral arterial disease was done between China and Western countries. The literature search was made on both English and Chinese data base from January 1, 1995 to March 1 ,2020 and high quality literatures were evaluated. The result showed the prevalence of PAD on both countries increased with age .

In contrast to the western countries women found to have high prevalence of PAD than men in china. There is increased in risk factors in china with low awareness on risk factors(15).

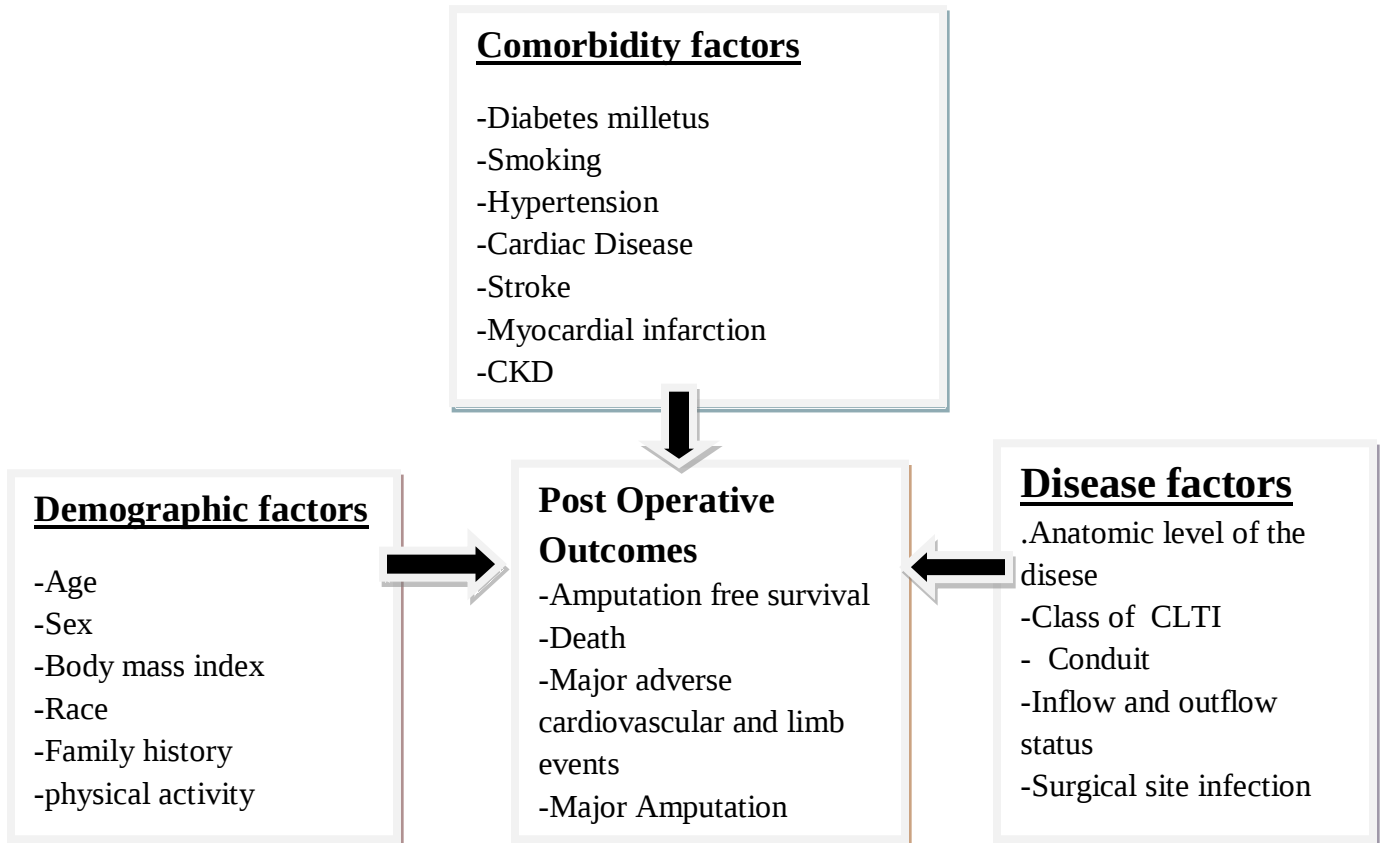
A prospective multicenter study was done on evaluation of outcomes after revascularization of CLTI using bypass , endovascular and hybrid methods. The results of the study Showed at one year the overall survival rate was 88.8%, Amputation free survival rate was 86.6%, primary patency was 70.5% and freedom from major limb events was 62.5%(16).

A prospective descriptive study was done in South Africa on demography, clinical, anthropometric profile and post operative outcomes in patients with chronic limb threatening ischemia. Patients' demographic data, anthropometric profile and post operative outcome were collected and analyzed. The study showed 86% of CLTI patients were smokers ,female patients presented at older age and 50.6% of patients' were found to have a BMI >25. On analysis of clinical level of the disease in the study into aortoiliac, femopopliteal and tibioperoneal was found to be 21.9% , 65.8%and 12.3% respectively .The disease profile on the study was 23.3% rest pain, 64.4% minor tissue loss and 12.3% major tissue loss. The average duration of presentation was found to be 13.7 +-13 weeks. In this study among patients who had revascularization procedure 79% of patient's limb was salvaged and 67% was able to ambulate 1 year after the revascularization. Results from this study found that 2/3rd of patients received open revascularization and 1/3rd of patients had endovascular intervention. From those patients who had bypass 41.9 % was with outogenous graft and 58.1 % was having prosthetic graft(5, 6).

A retrospective analytic study was done in Japan that evaluated overall survival and amputation free survival (AFS) after revascularization of CLTI . The study was done on the year period between 2013 to 2017 and study showed the overall survival was 69% and AFS was 62%. Strong predictors of survival in study were age, activity, malignat neoplasm, congestive heart failure and chronic kidney disease(17).

A study done in Sri Lanka on the outcomes following lower extremity vein bypass for CLTI patients showed 80% of patients were diabetes and 100% of patients were presented with tissue loss. The study also found a 30th post operative day MALE was 7.6% and MACE was 8.2% that were comparable with Society of Vascular Surgery resuts of MALE 6.2% and MACE 6.1% . After 1 year of revascularization the study showed over all survival 82%,limb salvage 81% and amputation free survival 64.5% (18, 19).

1.4 Conceptual Framework



1.5 Significance of the study

CLTI is the commonest vascular disease identified among admitted patients based on the previous study on pattern of vascular disease at TASH (20). There is a limited study that assess demography, comorbidity, postoperative outcome of chronic limb threatening ischemia LMICs (3). There is no similar study done in Ethiopia regarding post operative outcome and associated factors on CLTI. So the study will help identify the pattern and postoperative outcome of CLTI in our country and be used as a base for intervention and future care.

2. Objective

1.1 General objective

To assess postoperative outcome and Associated factors of lower extremity chronic limb threatening ischemia for whom revascularization procedure was done at Tikur Anbessa Hospital.

1.2 Specific Objective

1. To determine one year amputation free and over all survival of patients with chronic limb threatening ischemia for whom revascularization was done in Tikur Anbessa Hospital.
2. To evaluate associated factors which affect outcomes of chronic limb threatening ischemia patients for whom revascularization was done at Tikur Anbessa Hospital

3. Methods and Subjects

3.1 Study setting and study period

The research was conducted at Tikur Anbessa Specialized Hospital (TASH) from December 30, 2024 to May 30, 2025. The data collection took 5 months to complete. Tikur Anbessa Specialized Hospital is located in Addis Ababa. The Hospital is tertiary teaching hospital under Addis Ababa University and the main vascular Surgery Center in Ethiopia. In vascular unit Patients with CLTI is seen at emergency OPD and Vascular referral clinic. there are 3 days of elective OR per week for all types of vascular diseases. The study involved CLTI patients who underwent revascularization procedure from December 30, 2020 to May 30, 2024 at TASH..

3.2 Study Design

Retrospective analytic study

3.2.1 Study Population

Patients with vascular disease who underwent vascular surgery procedure

3.2.2 Source Population

All patients who were diagnosed with CLTI

3.2.3 Study Unit

All patients who were diagnosed with CLTI and fulfill the inclusion criteria

3.2.4 Inclusion And Exclusion Criteria

3.2.4.1 Inclusion Criteria

All patients who had revascularization surgery for CLTI

3.2.4.2 Exclusion Criteria

Incomplete data or lost chart

Patients who had major primary amputation and revascularization

3.3 Sample Size

The medical records of all CLTI patients who had lower extremity revascularization from Dec 30, 2020 to May 30, 2024 were included based on the inclusion criteria. A total of 151 patients charts were included for final analysis.

3.4 Sampling technique

Census sampling technique was used

3.5 Data collection tools and procedures

Patients who underwent revascularization surgery for CLTI were identified from OR logbook and using medical record number patients electronic data were tracked. Questioner was prepared and Patients preoperative clinical data and investigation result were reviewed and collected. Intraoperative and post operative data was filled and patients follow up for 1 year after revascularization were reviewed.

3.6 Variable of the study

3.6.1 Dependent variables

Post operative outcome after 1 year of revascularization (Amputation free survival ,MALE,MACE ,over all survival and major amputation)

3.6.2 Independent variables

- Demographic factors (age,gender)
- Co morbidity (hypertension , Diabetes, heart disease ,hypercholesterolemia ,chronic kidney disease)
- Clinical profile (rest pain ,ulceration, gangrene ,class of CLTI,Anatomic level of the disease)

3.7 Data quality management

Training regarding data collection was given for a day. The training includes how to track patients from operation log book and collect important demographic, comorbidity, preoperative clinical data, intraoperative procedure and post op outcome and follow up data from patients electronic data on the hospital database. Supervision of the data collector was done by the principal investigator . The collected data was checked for completeness and consistency ,coded and entered to SPSS version 25 statistical software for data cleaning and analysis.

3.8 Data processing and analysis

Demographic and clinical data of the study population were analyzed using descriptive statistics. Pie charts and bars were used to describe categorical variables where as continuous variables were described using a mean. Logistic regression models used to calculate crude and adjusted odds ratio and their corresponding intervals between determinat factor and postoperative outcomes of revascularization. Variables that was significant on bivariate analysis at p-value of less than 0.2 was taken to multivariate analysis. In multivariate analysis p-value less than 0.05 used as a cutoff point for the presence of association. Statistical analysis was performed using SPSS version 25.

3.9 Operational definitions

Chronic limb-threatening ischemia (CLTI): advanced stage of peripheral arterial disease in which patient has pain at rest or tissue ulceration existed for more than 2 weeks and has one or more deranged hemodynamic parameters. These hemodynamic parameters are ABI<0.4, absolute ankle pressure <50mmHg or absolute toe pressure <30mmHg(3)

Major amputation: . amputation in the lower limb that involve above the ankle joint .

Minor amputation: Amputation in the lower limb below the ankle joint .

Revascularization: making a surgical procedure to vascularize a limb like thrombectomy, endarterectomy or bypass.

By pass: revascularizing a limb using autogenous or prosthetic graft

Limb salvage: if the patient has no major amputation after revascularization following CLTI.

Amputation free survival: defined as freedom from major amputation and all cause mortality

Major adverse limb event (MALE): defined as major amputation of the affected leg or any additional major reintervention to the affected leg.

Major adverse cardiovascular events (MACE): the occurrence of non fatal stroke, non fatal myocardial infarction or Cardiovascular death.

3.10 Ethical clearance

Ethical clearance was obtained from AAU, CHS ,Surgery department ethical review board with approval number **DOSIREC/134/2025/2017** before data collection. Confidentiality and anonymity was maintained.

3.11 Plan for dissemination

The final research will be presented to the department of surgery, CHS, AAU. Manuscript will be submitted for publication in reputable journal.

4. Results

4.1 Patient characteristics

A total of 151 patients data who had revascularization procedures for CLTI from December 30, 2020 to May 30, 2024 at TASH were available and analyzed. Among patients who underwent revascularization 70.9% were male and 29.1% were female (**Table 1**). Patient's age was categorized into 3 groups and the first groups was age less than 50 years, the second between 50-65 years old and the last age group to be greater than 65 years old. 21.2% of CLTI patients were less than 50 years where as 40.4% were between 50-65 years and 38.4% of patients were greater than 65 years. The mean age of presentation was 65.26years for female and 59.4years for male and 61.6% patients were less than 65 years (Table 2).

Table 1. Gender distribution of limb ischemia patients

No.	Gender	Frequency	Percent
1	Female	44	29.1%
2	Male	107	70.9 %
	Total	151	100%

Table 2. Age distribution of limb ischemia patients

No.	Age range (year)	Frequency	Percent
1	<50	32	21.2%
2	50-65	61	40.4%
3	>65	58	38.4
	Total	151	100%

Risk factors for CLTI were assessed from the analysis and about 16.6% were active or previous smokers where as 83.4% patients never smoke any form of Tobacco (Table 3). With regard to comorbidity evaluation 79.5% patients had at least one comorbidity but in 20.5% patients any form of comorbidity was not identified (Table 4). The most frequently identified comorbidity was hypertension with a percentage of 39.1% among the study population.

Table 3. Smoking status of CLTI patients at TASH ,2025

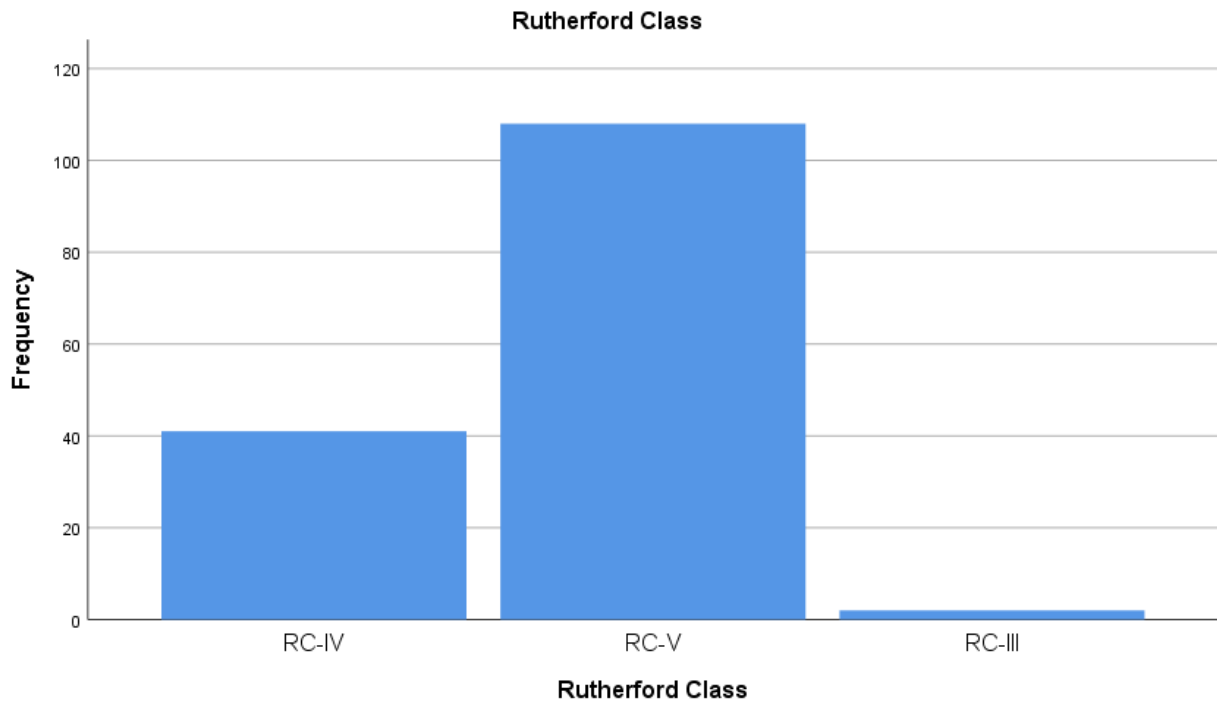
No.	Smoking status	Frequency	Percent
1.	Smoker	25	16.6%
2.	Never be a smoker	126	83.4%
	Total	151	100%

Table 4. Comorbidity pattern of CLTI patients at TASH ,2025

No.	Comorbidity	Frequency	Percent
1.	Diabetes militus	35	23.2%
2.	Hypertension	59	39.1%
3.	Cardiac disease	16	10.5%
4.	Smoking	25	16.6%%
5.	Multiple comorbidities	21	13.9%
6.	others	10	6.6%
7.	No comrbidity identified	31	20.5%

Analysis of the data showed most of the of patients who had revascularizarion presented with tissue loss 71.5% (108) and 27.2% (41) presented with rest pain . Only 1.3% (2) operated for severe claudication after medical therapy.

Figure 1. Rutherford clinical category revascularized patients at TASH ,2025



Patients who had revascularization were classified based on the type of arterial disease, and 76.8%(116) had femoropopliteal disease, 22.5%(33) had aortoiliac disease and 1.3%(2) were with infrapopliteal disease . The commonest performed procedure was bypass 67.5%(102) ,the second frequent procedure was endarterectomy and patch angioplasty 20.5%(31) and the remaining was 6%(9) thrombectomy,3.3%(5) thromboendarterectomy,2.6%(4) bypass and Endarterectomy .

Clinical level of the disease

Figure 2. Anatomic level of occlusion in CLTI patients at TASH,2025

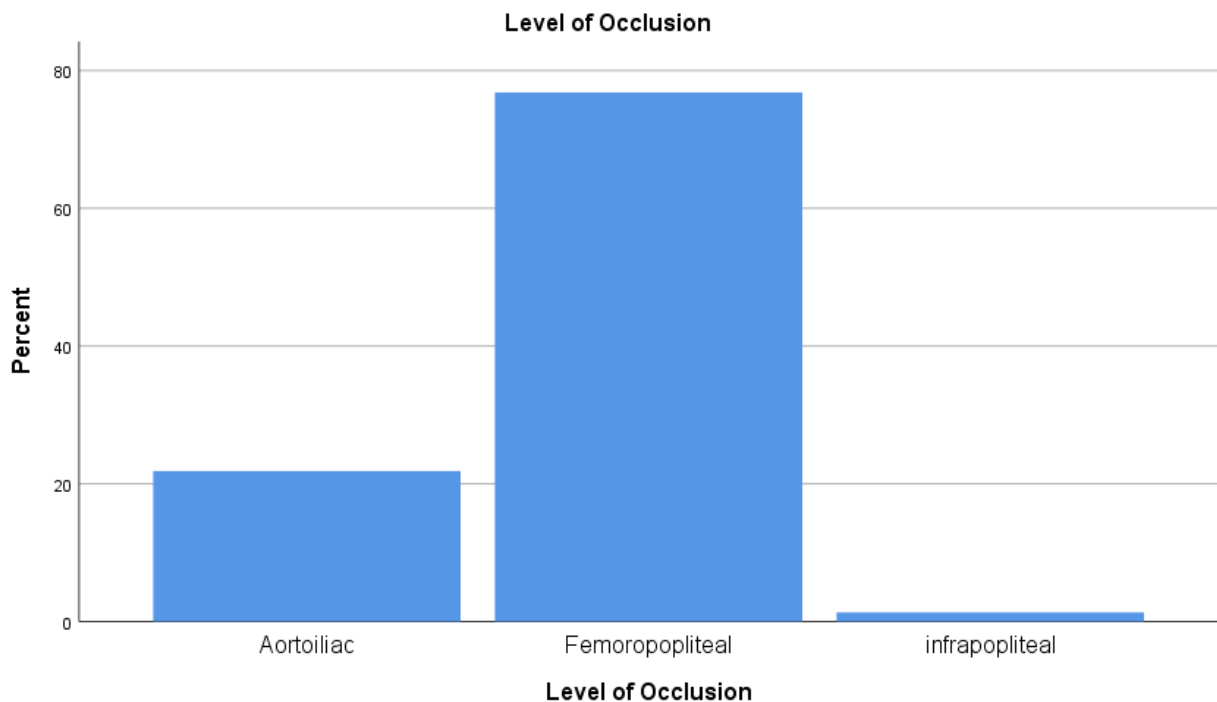
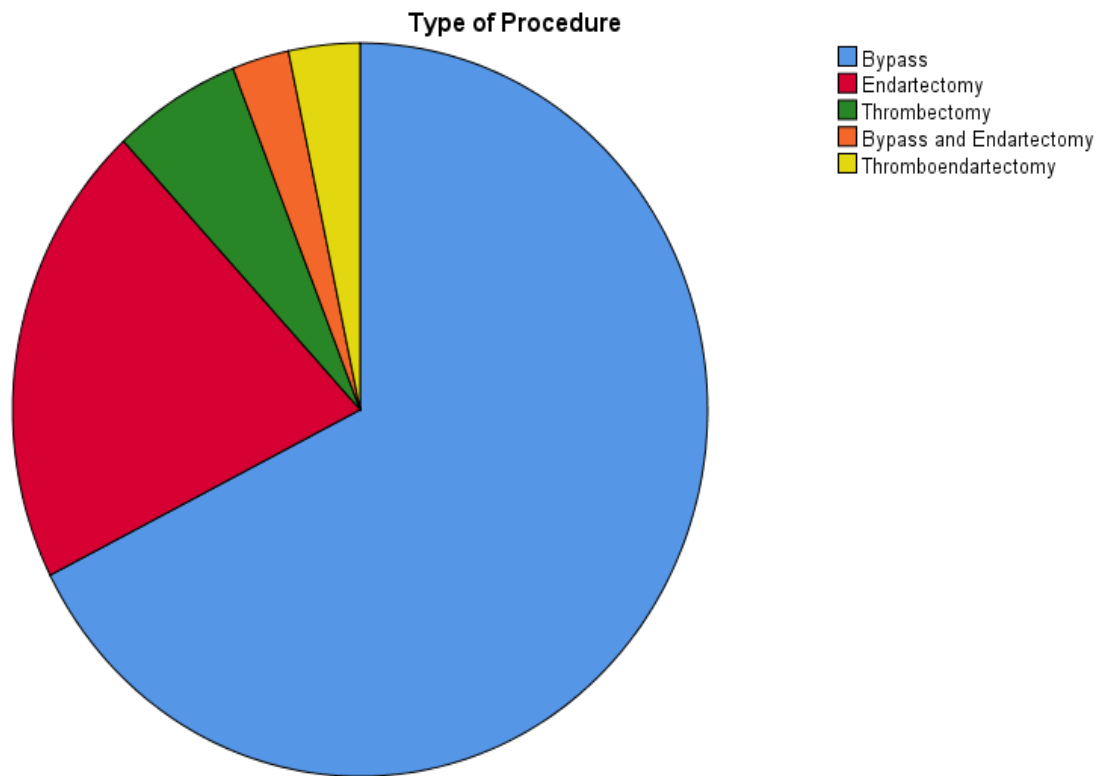


Figure 3. Type of revascularization performed for CLTI at TASH,2025



4.2 Postoperative Outcome

Each revascularized CLTI patients data were retrieved, and their follow up data within 1 year of the procedure was analyzed. Analysis of patients data showed 39 CLTI patients (25.8%) had major amputation with in 1 year after they were operated for a revascularization procedure (Table 5). There were about 7 deaths (4.6%) with 1 year of follow up after the procedure and the causes of death were 2 stroke,2 myocardial infarction (MI),1 over anticoagulation with intracranial bleeding and 2 with unknown causes. Further analysis of post operative outcome showed that 1 year amputation free survival rate was 71.5% . Upon retrieval of their subjective complaint on follow up clinic 93 (61.6)% patients reported they had improvement of rest pain and 88 (58.5%) of patients were ambulatory after revascularization . Patients postoperative surgical wound status were analyzed and 26 patients (17.2%) had surgical site infection

Table 5. Major Amputation, Over all survival and Amputation free survival of CLTI patients at TASH,2025.

No.	Outcome	Category	Frequency	Percent
1.	Major Amputation	Yes	39	25.8%
		No	112	74.2%
2.	All cause mortality	Yes	7	4.6%
		No	144	95.4%
3.	AFS	Yes	108	71.5%
		No	43	28.5%

Patients were evaluated for major adverse cardiovascular events, and about 7 patients (4.6%) developed cardiovascular events.

All independent variables were evaluated for association with outcome using logistic regression. Patients who developed postoperative wound infection and patients with diabetes mellitus were found to have significant association upon binary and multivariable logistic regression. Patients with diabetes mellitus had a P-value of 0.001 on binary and 0.001 on multivariable logistic regression . The odds ratio of patients with Diabetes for the outcome was 3.8. Patient who developed a wound infection postoperatively had also a P value of 0.006 on binary and 0.03 on multivariable logistic regression with odds ratio of 2.8 times compared with other groups.

Table 6. Binary logistic regression of chronic limb threatening ischemia patients at TASH, 2025

No.	Associated factors	P value in binary association	OR and CI
1.	Age	0.6	0.8 (0.5-1.3)
2.	Gender	0.3	0.6 (0.3-1.3)
3.	DM	0.001	3.8 (1.7-8.5)
4.	HTN	0.1	0.5 (0.2-1.5)
5.	Smoking	0.9	1 (0.3-2.6)
6.	Multiple comorbidities	0.4	1.4 (0.5-1.9)
7.	Class of Limb ischemia	0.4	1.3 (0.5-3.01)
8.	Anatomic level of the disease	0.6	0.8 (0.3-1.8)
9.	Type of procedure	0.3	0.8 (0.5-1.2)
10.	Surgical site infection	0.006	3.4 (1.4-8.4)
11.	Thrombectomy	0.28	0.4 (0.1-1.8)
12.	Bypass	0.25	0.6 (0.28-1.39)
13.	Endarterectomy	0.47	0.7 (0.3-1.67)

Table 7. Multivariable logistic regression of chronic limb threatening ischemia patients at TASH, 2025.

NO.	Significant Associated factor	Binary Regression	Multivariate Regression	OR and CI
1.	Diabetes Milletus	0.001	0.001	3.8(1.7-8.5)
2.	Surgical site infection	0.006	0.03	2.8 (1.17-6.8)
3.	HTN	0.2	0.2	1.6(0.7-3.6)

5. Discussion

In this study most of the study patients were younger age group in which 61.6 % were younger than 65 years and 20.2% of patients were younger than 50 years and the average age was 65.2 years for female and 59.4 years for male. Analysis of the study patient age showed the study population was relatively younger age group compared to 75 years published in different literature (3, 6, 21, 22) but comparable to a study in South Africa (5). The study also showed significant male predominance in the study population which was 70.9 % male patients and 29.1 % found to be female patients. The ratio of male to female in the study population was about 2.5 which was similar to other studies (23). Most of the patients presented with advanced ischemia in which 71% of revascularized patients had tissue loss upon presentation which is comparable to other studies (5).

The smoking status of revascularized CLTI patients were analyzed and found to be 16.6% (25 patients). Smoking status of the study population was significantly lower than the study on critical limb ischemia epidemiology in which smoking to be 70-90% (24).

The most frequent risk factor for limb threatening ischemia in the study was hypertension (39.1%) followed by diabetes (23.2%) and this was contrary to the existing literature, in which smoking is being the most common prevalent risk factor (5, 25, 26).

76.8% CLTI Patients were found to have femoropopliteal occlusion in this study and this was almost comparable with a study on determinants of postoperative outcome in CLTI with 71 % were femoropopliteal (6).

Analysis of major amputation, all-cause mortality and amputation free survival after 1 year was evaluated. Among revascularized CLTI patients 25.8% had major amputation. This was comparable with study in South Africa in which 21% of CLTI patients had major amputation (5) but much higher than amputation rate of 12% found with a systematic review and meta-analysis done in 2020 (12). Patient's data also reviewed for all cause mortality and it was 4.6% and 1 year over all survival was 95.5% and this was higher than European society vascular surgery studies which was 1 year over all survival of 75-80% (3, 27, 28). Further analysis of study patients follow up data revealed an amputation free survival rate of 71.5% at the end of one year after

revascularization. This was comparable with study in South Africa in which Amputation free survival was 69.9% (5)

Patients with diabetes were found to have a reduced amputation free survival with compared to non diabetic patients upon binary and multivariable logistic regression($p = 0.001$). This was comparable with studies which showed diabetic and CLTI patients had low low AFS (5, 29).

CLTI patients who developed surgical site infection after revascularization had a decrease in amputation-free survival compared to patients who had no SSI upon upon binary and multivariable logistic regression ($p = 0.03$). This was comparable with a study on risk analysis and clinical outcome in CLTI patients with surgical site infection (30).

6.Conclusion

The study showed a relatively younger population compared to other studies with male-to-female ratio of 2.5:1. Hypertension was the most common risk factor identified in the study population. The number of patients with smoking was found to be small compared to others. The rate of major amputation and amputation free survival was comparable with other studies. There was low all-cause mortality compared to the available literature. Patient with diabetes and Surgical site infection had a low amputation free survival compared to other patients who had no diabetes and did not develop surgical site infection.

7.Limitation of the study

The study is a retrospective study in which data was not originally collected for research purposes and some patients data was incomplete . This might affect the outcome some variables were incomplete from documentation and some patients lack proper documentation . Some important risk assessments like lipid profile are not properly followed in all patients.

8.Recommendation

The Finding underscores proper preoperative risk factor investigation and identification of CLTI patients so that their specific modifiable risk factor will be identified and managed. The causes of low amputation free survival in diabetic patients and patients with surgical site infection need to be investigated and identified.

Prospective study need to be done in revascularized CLTI patients to have proper follow up and detection of different parameters of postoperative outcome measures.

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Questionnaire

Card number (MRN)_____Code_____

Date of data collection_____

1. Address :Region/City_____Woreda_____

2. Age in years

3. sex Female Male

4. History of smoking Yes No

If yes for the above question No. packs per year

Duration of smoking

If stops smoking how long

5. History of co morbidity :Yes No

If yes which one

A. Diabetic mellitus

B. Hypertension

C. Cardiac disease

D. Chronic kidney disease

E. Others specify-----

6. History of intermittent claudication :yes No

7. Rest pain: yes No

8. Duration of rest pain

9. Gangre or leg ulceration

10. Gangrene/ulcer :yes No

If yes for question 7 specify Rutherford class_____

11. Anatomic level of occlusion

A. Aortoiliac occlusion yes: No

B. Femoropopliteal occlusion yes yes

C. Tibiopodal occlusion yes yes

12. Type of revascularization procedure_____

Post operative data

13. Wound infection :yes No

14.Cerebrovascular complication :yes☐ No

If yes specify ☐

15.Improvement of rest pain: Yes☐ No ☐

16.Post operative ambulation :Yes☐ No☐

17. Amputation :Yes☐ No☐

If yes for question no.13 specify the level of Amputation_____

The time of amputation after revascularization _____

18.Death :yes_____No_____

If yes possible cause of death_____