



# Impact of Surgical Treatment on Quality of Life and Functional Recovery of Patients with Combined Stenotic-Occlusive Lesions of Extracranial Arteries and Arteries of the Femoral-Popliteal-Tibial Segment

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**Abstract:** Impact of surgery is examined in individuals with combined stenotic-occlusive lesions of extracranial and femoral-popliteal-tibial arteries to determine its effects on functional recovery and quality of life. A 50-patient prospective cohort study. Men made up 92% of patients. The age distribution between 51 and 70 suggests a demographic background for surgical procedures, however caution is advised. Surgery frequency shows that bypass surgery is 40% common and that angioplasty, angioplasty with stent, and endarterectomy are versatile. After surgery, quality of life improved statistically, demonstrating the efficacy of therapies beyond functional recovery. While weariness during exercise varied, the overall beneficial outcomes suggest that surgical procedures can improve the lives of vascular disease patients. The findings enrich treatment plans and improve knowledge of subtle outcomes in functional recovery and QOL for doctors, researchers, and patients.

**Key Words:** surgical interventions, life quality assessment, rehabilitation after surgery, multifaceted arterial obstructions, extracranial arterial conditions, femoral-popliteal-tibial, arterial network

## I. INTRODUCTION

Cardiovascular diseases, particularly those affecting the arterial system, remain a significant global health concern, contributing to morbidity and mortality on a substantial scale. The frequency of all cardiovascular diseases almost doubled from 271 million in 1990 to 523 million in 2019, and cardiovascular disease deaths rose fast from 12.1 million to 18.6 million [1]. Among these, combined stenotic-occlusive lesions involving both extracranial arteries and the femoral-popliteal-tibial segment present a complex and challenging clinical scenario. Patients with such arterial pathology often experience compromised blood flow to vital organs and extremities, leading to a myriad of symptoms and functional limitations [2]. Stenotic-occlusive lesions in extracranial arteries and the femoral-popliteal-tibial segment refer to the narrowing or blockage of blood vessels in the legs, often due to atherosclerosis. Ischemic discomfort, claudication, tissue loss, and gangrene may arise from reduced perfusion [3].

Atherosclerotic disease of the aorta or lower limb arteries is known as peripheral artery disease, affecting up to 12 million Americans and 200 million people globally. More than 10% of adults in their seventh and eighth decades and 20% of those over eighty have the disorder. Men are more likely than women to have peripheral artery disease, especially if the condition is more severe or symptomatic [4].

Lower limb peripheral artery disease Peripheral artery disease affects around 230 million people worldwide and increases the risk of amputation, stroke, and other limb disorders. PAD is common and clinically significant, yet individuals and healthcare practitioners have discounted it [5], [6]. About 40% of people have both coronary and lower extremity artery disease, which have comparable risk factors. Clinical practice often searches for lesions in several vascular areas when one is ill. Additionally, CAD patients with peripheral vascular disease have a higher mortality rate [7]. Critical limb ischemia, the last stage of peripheral artery disease

(PAD), causes tissue loss and ischemic rest pain. Critical limb ischemia treatment focuses on saving the affected limb. Elderly people with critical limb ischemia who have long-term, major limb amputations have a rather good quality of life. These results may improve collaborative decision-making without delaying major limb amputation [8].

Amputation-free survival is used to determine how well critical limb ischemia therapy is working. It is possible to treat these lesions with both surgical and medicinal methods. Patients with severe symptoms or those who have not responded to medical and exercise therapy may be evaluated for surgical alternatives such as endovascular procedures, stenting, and bypass surgery. Medical management may involve both pharmaceutical and nonpharmacologic therapies [9]. Research on the efficacy of deep and superficial femoral artery profundoplasty and stenting in lower limb arterial disease patients is ongoing. Endovascular procedures like stenting address superficial femoral artery occlusion [10].

Psychology effects of health problems especially in these patients alter the functional capacity of individuals. This illness increases the risk of depression, suicide, alcohol and drug abuse, and immunological, endocrine, and cardiovascular system dysfunction. PTSD may cause job and home social inadaptation [11]. Research emphasizes the importance of addressing psychological aspects in overall well-being. These psychological correction methods could be integrated into the post-surgical care to enhance patients' mental and emotional states, potentially contributing to a more comprehensive recovery process and improving the overall quality of life for patients with combined stenotic-occlusive lesions [12]. Modernization of medical care especially in armed conflicts emphasizes the severe impact on healthcare infrastructure and personnel. This underscores the urgency of surgical interventions for patients with stenotic-occlusive lesions, emphasizing the broader goal of enhancing quality of life in conflict-affected regions [13]. While the Ukrainian healthcare system grapples with structural inefficiencies and public mistrust, innovative initiatives on a national scale offer potential avenues for improvement. Exploring the impact of surgical treatment on patients with combined stenotic-occlusive lesions could shed light on how these innovations may contribute to enhanced quality of life and functional recovery in Ukraine's healthcare landscape [14]. The incorporation of digital technologies in healthcare, particularly in the context of combined stenotic-occlusive lesions, promises to elevate surgical precision and patient care. The convergence of telemedicine and artificial intelligence further hints at potential improvements in the quality of life and functional recovery outcomes for individuals undergoing surgical interventions [15]. Exploring psychological rehabilitation for pregnant women affected by war in Ukraine sheds light on holistic healthcare. Integrating mental health insights may similarly enhance recovery strategies for patients undergoing surgical treatment for combined arterial lesions, emphasizing the interconnectedness of physical and psychological well-being [16].

Patients with symptoms that limit their lifestyle or in situations when medication and exercise therapy are ineffective, may benefit from surgical treatment alternatives such as endovascular treatments and bypass surgery. The severity of the ailment and the particular circumstances of the patient determine which intervention is best [17].

In overall, a multidisciplinary strategy is used to address coupled stenotic-occlusive lesions in the femoral-popliteal-tibial segment and extracranial arteries. The goals of this approach are to improve blood flow, relieve symptoms, and avoid consequences including tissue loss and gangrene [18].

The importance of addressing combined stenotic-occlusive lesions in extracranial arteries and the femoral-popliteal-tibial segment for overall patient health is underscored by the potential impact on quality of life and the risk of serious complications. These lesions can lead to symptoms such as ischemic pain and claudication, which can significantly impair a patient's mobility and overall quality of life. Addressing these lesions can help alleviate symptoms and improve the patient's ability to engage in daily activities [18]. Left untreated, stenotic-occlusive lesions can progress to more severe conditions, including tissue loss and gangrene, which may ultimately necessitate amputation. By addressing these lesions, the risk of such complications can be mitigated, preserving the patient's limb and overall health [19].

Various treatment options, including medical management, endovascular interventions, and surgical approaches, are available to address these lesions. These interventions aim to improve blood flow, relieve symptoms, and prevent disease progression, ultimately contributing to the patient's overall health and well-being [3].

**Multidisciplinary Approach:** Managing these lesions often requires a multidisciplinary approach involving healthcare professionals from different specialties, such as vascular surgery, interventional radiology, and cardiology. The significance of treating these lesions for the patient's general health is further highlighted by this collaborative approach, which guarantees the patient receives complete care catered to their specific needs [20].

In summary, addressing combined stenotic-occlusive lesions in extracranial arteries and the femoral-popliteal-tibial segment is crucial for improving the patient's quality of life, preventing serious complications, and providing access to a range of treatment options that can positively impact their overall health and well-being.

Surgical interventions play a significant role in managing combined stenotic-occlusive lesions in extracranial arteries and the femoral-popliteal-tibial segment. Stenting and Percutaneous Transluminal Angioplasty (PTA) are frequently suitable treatments for superficial femoral, popliteal, and iliac artery strictures or short-segment occlusions. Additionally, hemodynamically important iliac artery disease can be effectively treated by the implantation of arterial stents, especially short-segment stenotic and occlusive disease [21].

Enderarterectomy may be helpful to remove localized embolizing ulcerated plaque or in situations of severe limb-

threatening stenosis, especially in the case of a profundoplasty (endarterectomy of the deep femoral artery). For prolonged stenotic or occlusive femoropopliteal artery lesions, bypass surgery using the greater saphenous vein is ideal [22].

It has been advised to use differentiated methods when deciding how to treat multifocal atherosclerotic lesions in arterial basins. In some circumstances, revascularization of both arterial basins is necessary to enhance the outcome of surgical therapy for combined occlusion-stenotic lesions of the aorto-iliac-femoral segment and extracranial arteries [23].

Vascular surgery is recommended for treating complex, long-segment stenoses and occlusions of the infra-popliteal arteries, especially when endovascular interventions are not technically successful. Interventional treatment is advised for occlusive and stenotic lesions under 5 and 10 cm. In cases of chronic stenosis or occlusion, bypass surgery is preferable because to its better long-term patency rate [23], [24].

In summary, surgical interventions such as PTA, stenting, endarterectomy, and bypass surgery are crucial in the management of combined stenotic-occlusive lesions in extracranial arteries and the femoral-popliteal-tibial segment. These interventions aim to improve blood flow, relieve symptoms, and prevent disease progression, providing valuable options for patients with these arterial lesions.

## II. RESEARCH PROBLEM

The study addresses the impact of surgical treatment on patients with combined stenotic-occlusive lesions of extracranial arteries and arteries of the femoral-popliteal-tibial segment. The research problem involves understanding the gender distribution, age distribution, types of surgical procedures performed, duration of lesions, and the effects on quality of life and functional recovery.

### A. RESEARCH FOCUS

The research focuses on investigating the prevalence of the studied condition, the demographic characteristics of the patient population, the variety of surgical procedures employed, the duration of lesions, and the changes in both quality of life and functional recovery post-surgical intervention.

### B. RESEARCH AIM

The aim of the research is to comprehensively analyze and understand the impact of surgical treatment on patients with combined stenotic-occlusive lesions of extracranial arteries and arteries of the femoral-popliteal-tibial segment. This includes assessing the distribution of gender and age, the types of surgical procedures performed, the duration of lesions, and the resulting changes in quality of life and functional recovery.

### C. RESEARCH QUESTIONS

- 1) What is the gender distribution among patients with combined stenotic-occlusive lesions, and is there a significant predominance of males in the dataset?

- 2) How is the age distributed within the patient population, and what age groups are more susceptible to the studied condition?
- 3) What types of surgical procedures are commonly employed for patients with combined stenotic-occlusive lesions, and what is the frequency distribution of these procedures?
- 4) What is the duration distribution of lesions among the patient population, and how does it correlate with the chosen surgical interventions?
- 5) How does the surgical treatment impact the quality of life for patients, and what are the observed changes in preoperative and postoperative quality of life scores?
- 6) What is the effect of surgical treatment on functional recovery, specifically in terms of difficulty walking, fatigue during exercise, mobility, range of motion, and pain during activity? The research questions aim to provide a comprehensive understanding of the studied population, the surgical interventions, and the resulting changes in both quality of life and functional recovery.

## D. LITERATURE REVIEW

Primary causes of critical limb ischemia or intermittent claudication is superficial femoral artery damage. For this medical entity, one of the authorized therapies is percutaneous transluminal angioplasty. The appropriate technique and puncture should be chosen after taking anatomy into account. The optimal therapy for superficial femoral artery (SFA) stenosis or occlusion is endovascular or surgical revascularization, as discussed in the research *Endovascular Interventions to Superficial Femoral Artery Occlusion*. It offers information on various methods, procedures, and aftercare for angioplasty to open blocked superficial femoral arteries [25].

Peripheral arterial disease poses a substantial burden on both morbidity and healthcare costs, primarily impacting the major and intermediate arteries in the lower extremities. This research delves into the correlation between the quality of life experienced by patients and the presence of arterial stenosis or occlusion, particularly in instances of claudication or critical limb ischemia. The study explores the physiological significance of stenosis and examines how patients assess various therapies for managing peripheral artery disease [26].

The existing research on endovascular treatment for subclavian artery stenosis and occlusion underscores the need for further investigation with larger sample sizes and extended follow-up periods to substantiate these findings [27].

Research was undertaken to assess the efficacy of arterial bypass, repeat percutaneous transluminal angioplasty, and noninvasive therapy in managing patients with recurrent stenosis. The findings indicate that arterial bypass demonstrates superior safety and effectiveness compared to repeat percutaneous transluminal angioplasty for the treatment of recurrent stenosis in patients [28].

Peripheral artery disease is becoming more commonplace globally; estimates put the number of affected individuals at

over 200 million. Reduced quality of life and a reduction in ambulatory function are the results of advanced. The treatment of PAD symptoms mostly involves limb revascularization. Revascularization strategies have been evolving in tandem with advancements in the previous 20 years on the pathophysiology, genetics, and medicinal therapy of PAD. The subject of whether patients should be provided surgical revascularization has come back into focus as a consequence of the increased use of endovascular procedures, which has also caused substantial changes in practice patterns. However, surgical treatment continues to be the mainstay of care for advanced PAD, offering adaptable and long-lasting answers to difficult disease patterns [29].

Usually, individuals with more advanced illnesses or those in whom nonsurgical treatment has failed are the ones who are eligible for these surgical procedures. The patient's reaction to nonsurgical care, the severity of the condition, and other unique considerations all play a role in the decision between various procedures. Patients with PAOD now have more alternatives thanks to the changing revascularization environment, which includes the growing use of endovascular procedures [30]. Individuals who have stenotic or occlusive lesions in the lower extremity artery supply may face severe blood flow restrictions when exercising. Exercise intervention has been shown to have a good influence on patients' quality of life and functional recovery by dramatically reducing the severe functional impairment linked to claudication [31].

Studies have reported successful recanalization of chronic total occlusion lesions leading to improvements in cardiac function, indicating the potential for functional recovery in patients with multi-vessel disease [32]. Research indicates that a significant number of radial artery grafts may have late functional recovery and patency restoration, underscoring the possibility of successful surgical results [33].

For intermittent claudication, there aren't many controlled studies that compare revascularization to exercise training. But when compared to receiving the best medical treatment possible alone, the CLEVER trial showed that supervised exercise training or stenting significantly improved peak walking time and claudication onset time. This suggests that both strategies may have a good effect on functional recovery.

### III. MATERIALS AND METHODS

#### A. STUDY DESIGN

A prospective cohort study design to assess the impact of surgical treatment on both quality of life (QOL) and functional recovery in patients with combined stenotic-occlusive lesions.

#### B. PARTICIPANT RECRUITMENT

##### 1) Inclusion Criteria

Patients diagnosed with combined stenotic-occlusive lesions of extracranial arteries and arteries of the femoral-popliteal-tibial segment. Patients scheduled for surgical treatment.

##### 2) Exclusion Criteria

Patients with contraindications for surgery. Patients unwilling or unable to provide informed consent.

#### C. SAMPLE SIZE

A consecutive sample of 50 patients were included

#### D. ETHICAL CONSIDERATIONS

Obtained ethical approval from the IRB. Ensured voluntary and informed consent from all participants. Guaranteed participant confidentiality and anonymity.

#### E. DATA COLLECTION AND ANALYSIS

Data was collected on basic demographic information (age, gender, etc.) and baseline quality of life using standardized QOL assessment tools and baseline functional recovery parameters, including difficulty walking, fatigue during exercise, mobility, range of motion, and pain during activity was measured. Document details of surgical procedures performed, including bypass surgery, angioplasty, angioplasty with stent, and endarterectomy. Record lesion duration to account for variations in disease progression. Conducted a regular follow-up assessment at predefined intervals post-surgery.

Employed an appropriate statistical method to analyze the data, including descriptive statistics for demographic information, surgical procedures, and lesion duration. Utilized a paired t-tests to compare preoperative and postoperative QOL scores and functional recovery parameters. Interpret the findings in the context of both QOL and functional recovery outcomes.

### IV. RESULTS

The results section of the study provides a comprehensive insight into the demographic and procedural landscape of patients undergoing surgical treatment for combined stenotic-occlusive lesions of extracranial arteries and arteries of the femoral-popliteal-tibial segment. The distribution of patients according to gender reveals a significant male preponderance, with males accounting for 92% of the total patients. In light of this considerable imbalance, it is necessary to conduct an in-depth investigation of the possible gender-specific variables that influence the occurrence of these lesions as well as the subsequent response to surgical procedures. Moving on to the age distribution, it is clear that the fifty participants have a wide demographic profile, with a notable concentration in the age range of 51 to 70 years old. As the age advanced the incidence of atherosclerotic plaque increased resulting in decreased vascular circulation Figure 1 shows an unstable atherosclerotic plaque that is characterized by erosions, rupture of the fibrous cap, calcinosis, sclerosis (hardening), and potentially changes in the vasa vasorum. These features increase the risk of complications such as blood clot formation, leading to serious cardiovascular events like heart attacks or strokes. There are multiple types of investigation available to diagnosis and early management of patients like



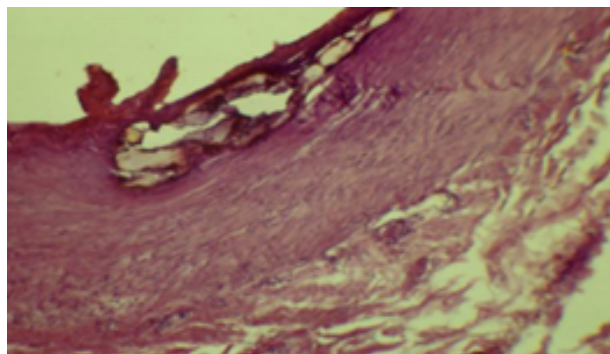


FIGURE 1: Histopathological slide showing vascular cross section

CT brain, CT head and neck and CT abdomen and pelvis as showing in Figure 3 and 4. There is a significant association between the disease that was researched and those who are middle-aged or older, as shown by the large number of surgical operations that are performed within this age group. Furthermore, the wide range of surgical treatments, draws attention to the predominance of bypass surgery, and emphasizes the need of gaining a more in-depth knowledge of the relative efficacy of various surgical modalities. The length of the lesion displays a spectrum of temporal presentations, which prompts an investigation into the distinct difficulties that are linked with both short-term and long-term lesions. To diagnose the vasculature problem especially in lower limb CT Angio lower limb is advised as show in Figure 2. The effect that surgical treatments have on the quality of life substantiates a statistically significant improvement, so setting the framework for a more nuanced investigation of the components that contribute to this increase. A complete canvas for future investigation and comprehension of the rehabilitative components of surgical procedures is provided by the findings, which, in conclusion, demonstrate favorable outcomes in functional recovery. These outcomes include improvements in walking difficulties, mobility, range of motion, and pain experienced during activities.

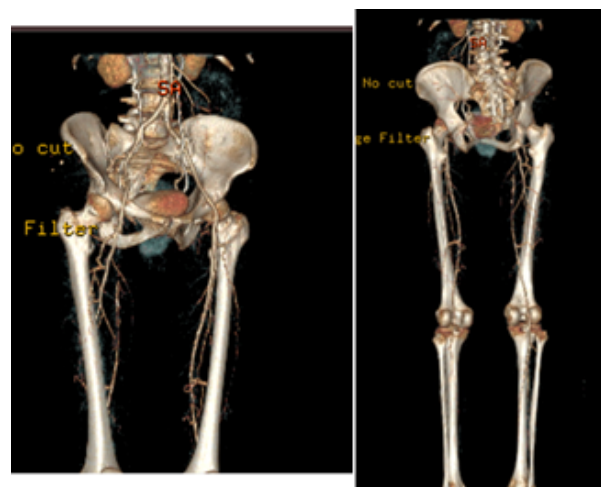


FIGURE 2: CT angio lower limb

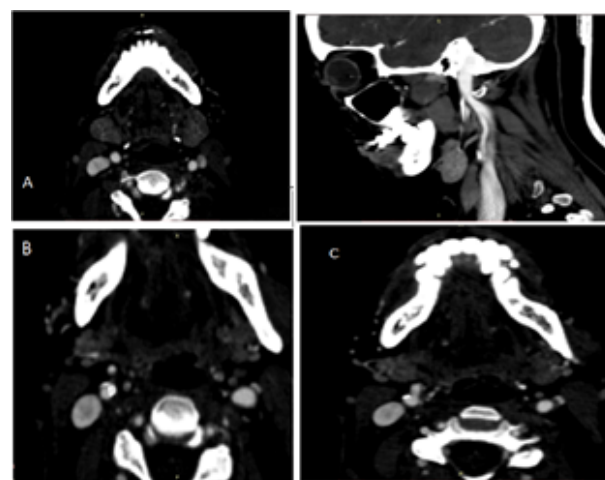


FIGURE 3: CT head and neck

**A. GENDER DISTRIBUTION**

Figure 5 presents the statistics on the gender distribution of 50 patients. One hundred and twenty percent of the overall sample is comprised of male patients, which accounts for forty-six out of the total number of patients. On the other hand, the remaining four patients are each female, which accounts for eight percent of the total population. According to these results, there seems to be a significant proportion of male patients within the sample.

**B. AGE DISTRIBUTION**

Table 1 shows the frequency distribution of age and offers a comprehensive overview of the age composition within the given sample of 50 individuals. Divided into distinct age groups, the table provides both raw frequencies and corre-

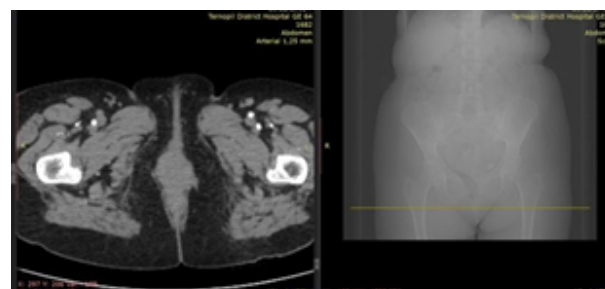


FIGURE 4: CT abdomen and pelvis

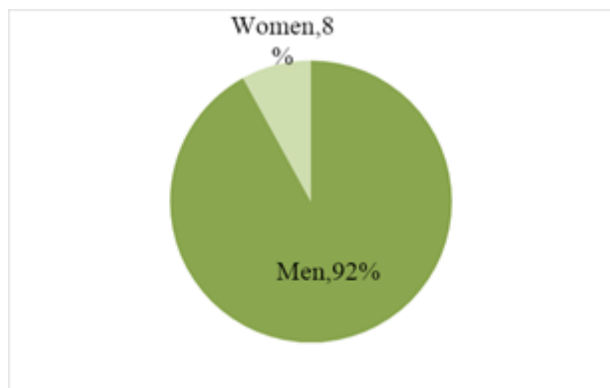


FIGURE 5: Gender distribution

Age Group	Frequency	Percentage
<50	7	14.0
51-60	22	44.0
61-70	20	40.0
>70	1	2.0
Total	50	100.0

TABLE 1: Frequency distribution of age

sponding percentages, facilitating a nuanced interpretation of the demographic distribution. Among the key findings, individuals aged 51-60 constitute the largest segment of the sample, comprising 44.0% of the total. This suggests a significant concentration of individuals in their fifth and sixth decades of life. Additionally, the age range of 61-70 contributes substantially, representing 40.0% of the sample. On the other hand, individuals below the age of 50 make up 14.0%, while those above 70 are the least prevalent at 2.0%. The dominance of the 51-60 age group implies a central tendency towards middle-aged individuals in the sample. This skew in distribution may have implications for the study, depending on its objectives and focus. The concentration of individuals in the 51-70 age range (84.0% combined) further underscores the middle to older age demographic within the sample. Overall, this frequency distribution provides a concise summary of the age distribution in the given sample, allowing for a quick understanding of the age composition and its potential implications for the study at hand.

**C. TYPE OF SURGICAL PROCEDURE**

Table 2 presents a frequency distribution of surgical procedures performed, with a total sample size of 50 cases. The data reveals that bypass surgery is the most frequently conducted procedure, constituting 40.0% of the total cases. Angioplasty and Angioplasty + Stent procedures each account for 20.0%, suggesting a substantial proportion of cases involve these interventions. Endarterectomy has a frequency of 10 cases, representing 20.0% of the total. The table provides a clear snapshot of the distribution of surgical procedures in the sample, emphasizing the prevalence of bypass surgery. This information is vital for healthcare professionals, researchers, and policymakers to understand the pattern of surgical inter-

Surgical Procedure	Frequency	Percentage
Angioplasty	10	20.0
Angioplasty + Stent	10	20.0
Bypass Surgery	20	40.0
Endarterectomy	10	20.0
Total	50	100.0

TABLE 2: Frequency distribution of surgical procedure

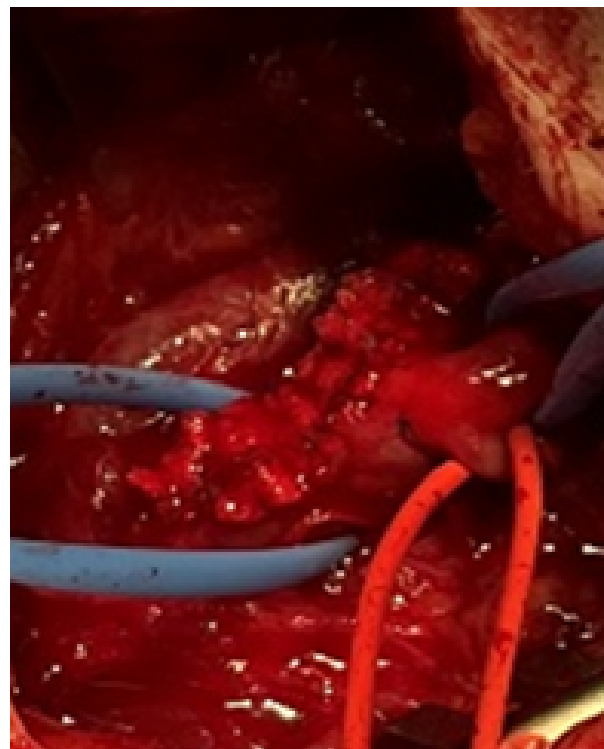


FIGURE 6: Carotid endarterectomy with plasty

ventions in the given context, facilitating informed decision-making and resource allocation in the healthcare system. Figure 6 Carotid endarterectomy with plasty of the common and internal carotid arteries. The overall goal of carotid endarterectomy with plasty is to remove the atherosclerotic plaque causing the narrowing of the carotid arteries and to restore proper blood flow to the brain. By combining endarterectomy with additional techniques like plasty, surgeons aim to minimize the risk of complications and optimize the long-term outcome for the patient, reducing the likelihood of future strokes related to carotid artery disease. In conclusion, the frequency distribution highlights a predominant utilization of bypass surgery in the sample, comprising 40.0% of cases. The data underscores the significance of understanding procedural patterns for effective healthcare planning and resource allocation. Such insights contribute to informed decision-making in the context of cardiovascular surgical interventions.

**D. DURATION OF LESION**

Table 3 illustrates the frequency distribution of lesion duration in a study examining the "Impact of Surgical Treatment

Surgical Procedure	Frequency	Percentage
Angioplasty	10	20.0
Angioplasty + Stent	10	20.0
Bypass Surgery	20	40.0
Endarterectomy	10	20.0
Total	50	100.0

TABLE 3: Frequency distribution of lesion duration

Mean	SD	SEM	95% CI
-2.292	1.400	.198	-2.690
t = -11.580, df = 49 and Sig. (2-tailed) = .000			
Note: SD = Std. Deviation, SEM = Std. Error Mean			

TABLE 4: Impact on quality of life (preoperative and postoperative)

on Quality of Life and Functional Recovery of Patients with Combined Stenotic-Occlusive Lesions of Extracranial Arteries and Arteries of The Femoral-Popliteal-Tibial Segment." Among the 50 cases, lesions lasting between 1 and 3 months were the most prevalent (38.0%), followed by lesions lasting between 3 and 12 months (50.0%). Lesions lasting less than 1 month accounted for 8.0%, while those lasting over 1 year constituted 4.0%. The distribution provides valuable insights into the temporal characteristics of lesions in the examined context. Researchers and healthcare professionals can use this information to better understand the prevalence of different lesion durations and tailor interventions or studies accordingly.

**E. QUALITY OF LIFE**

Table 4 shows the analysis of preoperative and postoperative QOL scores that revealed a significant improvement in QOL, with a mean difference of -2.292 (SD = 1.400). The 95% confidence interval of the difference (-2.690 to -1.894) indicated that this improvement was statistically significant. The associated t-test with 49 degrees of freedom yielded a p-value less than 0.001, further supporting the conclusion that the observed improvement (decline in QOL scores) was not likely due to chance. These findings suggest that the surgical intervention had a noteworthy and positive impact on the quality of life for the studied patient population.

In conclusion, the analysis of preoperative and postoperative QOL scores demonstrates a significant improvement, with a mean difference of -2.292 (SD = 1.400). The 95% confidence interval (-2.690 to -1.894) and a p-value < 0.001 from the t-test with 49 degrees of freedom affirm the statistical significance, indicating a substantial positive impact of the surgical intervention on the quality of life in the studied patient population.

**F. FUNCTIONAL RECOVERY**

Figure 7 shows the impact of surgical treatment on the functional recovery of patients with combined stenotic-occlusive lesions of extracranial arteries and arteries of the femoral-popliteal-tibial segment indicate overall positive outcomes. Patients experienced a notable improvement in difficulty

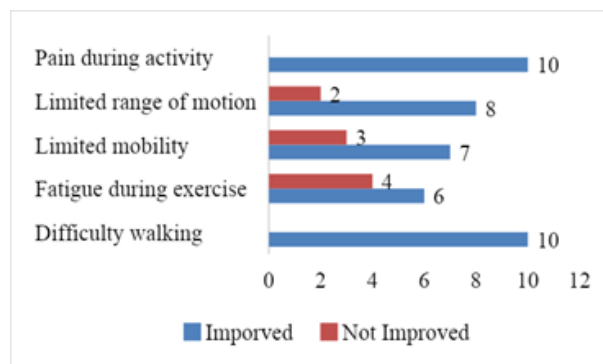


FIGURE 7: Comparison of pre and postoperative functional recovery

walking, with all participants showing enhancement in this aspect. Fatigue during exercise demonstrated a mixed response, with some improvement noted in 60% of cases. Mobility saw a positive trend, with 70% of patients experiencing increased mobility post-surgery. The range of motion also significantly improved for 80% of participants. Additionally, pain during activity showed substantial positive outcomes, with all patients reporting either a reduction or elimination of pain following the surgical intervention.

**V. DISCUSSION**

The gender distribution reveals a notable gender imbalance among the 50 patients included in the study. The overwhelming majority, comprising 92.00% of the total, are male in contrast, the female representation is considerably lower, with only 8.00% of the overall population. This stark difference underscores a significant predominance of male patients in the dataset. Several factors could contribute to this gender disparity. It may reflect the prevalence of the medical condition under investigation, suggesting that the condition is more commonly diagnosed or treated in males. Alternatively, it could be influenced by demographic or healthcare-seeking behavior patterns, where men may be more likely to seek medical attention or be referred for this particular condition compared to women. Other studies also demonstrate that gender differences play a significant role in the recovery and functional outcomes of surgical treatments. Factors such as expectations, preoperative function, and demographic attributes have been identified as influential in predicting postoperative recovery and quality of life [34]. The gender disparity observed in the distribution of patients included in the study also reflected similar trends in functional recovery outcome and quality of life in other studies as well [35].

The age distribution findings in the study provide valuable insights into the demographic profile of the participants. The age distribution has implications for understanding the demographic context in which surgical interventions are pursued. The concentration of surgical cases within the 51-70 age range implies that individuals in this bracket are more likely

to undergo surgical treatment for the studied condition. This observation may be indicative of the disease's progression or the medical decision-making process favoring surgery for those in this age group. Other studies also shows that limb ischemia in the elderly population is associated with high mortality and higher burden of comorbidity [36], [37].

The frequency distribution of surgical procedures in the study data indicates a diverse distribution of surgical procedures. Bypass surgery stands out as the most prevalent, constituting 40% of the total cases. Another study also suggests that bypass surgery is a commonly chosen intervention in this patient population, possibly due to its effectiveness in addressing the combined stenotic-occlusive lesions [38].

The equal distribution of angioplasty and angioplasty with stent, each accounting for 20% of the cases, highlights the versatility of these procedures in the context of arterial lesions. Endarterectomy also contributes significantly, making up 20% of the total procedures. These findings not only in consistent with other studies but also shed light on the prevalence of different surgical approaches and explore the potential correlations between specific procedures and the quality of life and functional recovery [39].

The distribution of lesion duration provides valuable insights into the heterogeneity of the patients' conditions within the study cohort. It serves as a crucial foundation for understanding the varied temporal aspects of the disease, which, in turn, can inform the assessment of the impact of surgical interventions. Recognizing the different durations of lesions is essential for tailoring treatment plans to individual cases, considering the potential variations in responses to surgical procedures based on the duration of the condition. These findings are similar to another study revealing the differentiated approach to surgical tactics, considering lesion duration, underscores the importance of tailoring interventions based on the heterogeneity of patients' conditions. This recognition of varied lesion durations provides a crucial foundation for understanding the temporal aspects of the disease, offering valuable insights that can inform the assessment of the impact of surgical interventions. The correlation between lesion duration and the effectiveness of surgical interventions contributes to a nuanced understanding of factors influencing outcomes, guiding individualized patient care and advancing knowledge in the field [39].

The analysis of preoperative and postoperative QOL scores revealed a statistically significant improvement in QOL, as indicated by a mean difference of -2.292 (SD = 1.400). The 95% confidence interval of the difference (-2.690 to -1.894) further supported the statistical significance of this improvement. The associated t-test with 49 degrees of freedom yielded a p-value less than 0.001, reinforcing the conclusion that the observed improvement (a decline in QOL scores) was not likely due to chance. These findings strongly suggest that the surgical intervention had a noteworthy and positive impact on the quality of life for the studied patient population. The negative mean difference in QOL scores indicates an improvement, with a higher negative value suggesting a more

substantial positive impact. It can be inferred that the surgical treatment was effective in enhancing the overall well-being and quality of life for patients with the specified vascular conditions. This information is crucial for both clinicians and patients, providing valuable insights into the benefits of surgical intervention beyond just functional recovery, extending to the broader aspect of an improved quality of life. Another study found that surgical bypass provided a better ankle-brachial index at the 3rd month of revascularization compared to percutaneous transluminal angioplasty [40].

Notably, all participants experienced a significant improvement in difficulty walking, suggesting that the surgical intervention positively influenced this crucial aspect of mobility. The mixed response observed in fatigue during exercise, with a 60% improvement rate, indicates that while a substantial portion of patients benefited, there is some variability in outcomes for this particular functional parameter. Mobility exhibited a positive trend in 70% of patient's post-surgery, emphasizing the potential for surgical treatment to enhance overall movement capabilities. The substantial improvement in the range of motion for 80% of participants further supports the positive impact of the surgical intervention on patients' ability to move their limbs more freely. The elimination or reduction of pain during activity reported by all patients is a significant achievement, indicating an enhancement in the overall quality of life following surgery. In summary, the study's findings suggest that surgical treatment has a positive influence on various facets of functional recovery, including walking difficulty, mobility, range of motion, and pain during activity. While the outcomes are generally favorable, there is some variability, particularly in fatigue during exercise. The comparison presented in Figure 2 likely provides a visual representation of the pre and postoperative functional recovery, offering a comprehensive overview of the improvements achieved across different parameters. This study underscores the potential of surgical interventions to positively impact the lives of patients with combined stenotic-occlusive lesions, emphasizing the need for further exploration and understanding of the nuanced outcomes in different aspects of functional recovery. One study found that successful bypass surgery improved the quality of life in patients with critical limb ischemia [40]. Finally, a review article on peripheral arterial occlusive disease treatment and management suggest that surgical treatment can have a positive impact on the quality of life and functional recovery of patients with combined stenotic-occlusive lesions of extracranial arteries and arteries of the femoral-popliteal-tibial segment.

## VI. CONCLUSION

In conclusion, a thorough evaluation of the many variables affecting functional recovery and quality of life is offered by the research on the effects of surgical therapy for patients with combined stenotic-occlusive lesions of extracranial arteries and arteries of the femoral-popliteal-tibial segment. The gender distribution revealed a significant predominance



of male patients in the dataset, prompting considerations of potential medical condition prevalence or healthcare-seeking behavior patterns. The age distribution highlighted a concentration of surgical cases in the 51-70 age range, offering insights into demographic contexts and decision-making processes related to surgical interventions. The frequency distribution of surgical procedures indicated a diverse array, with bypass surgery standing out as the most prevalent, emphasizing its effectiveness in addressing the studied vascular conditions.

## VII. RECOMMENDATIONS

The findings contribute valuable insights for clinicians, researchers, and patients alike, guiding individualized care, refining treatment strategies, and advancing knowledge in the field. The study underscores the multifaceted benefits of surgical interventions, extending beyond functional recovery to encompass a meaningful enhancement in the overall quality of life for patients with combined stenotic-occlusive lesions. The distribution of lesion duration underscored the heterogeneity of patient conditions, laying the foundation for tailoring treatment plans and exploring correlations with surgical outcomes. Notably, the study demonstrated statistically significant improvements in both functional recovery and quality of life following surgical intervention. The positive impact on difficulty walking, mobility, range of motion, and pain during activity reflects the effectiveness of surgical treatment in enhancing various facets of patients' lives. While some variability was observed in fatigue during exercise, the overall trends suggest a favorable influence of surgery on functional abilities.

Further research and exploration are warranted to delve into the nuanced aspects of these outcomes and optimize treatment approaches in this specific medical context.

Address the notable gender imbalance observed in the study population. Further research could investigate the reasons behind the predominance of male patients, exploring whether it is linked to the prevalence of the medical condition, healthcare-seeking behaviors, or other demographic factors. Understanding and addressing these disparities are crucial for providing equitable healthcare.

Recognize the concentration of surgical cases within the 51-70 age range. While this age group may be more prone to undergoing surgical treatment, it is essential to approach conclusions about age cautiously. Future studies could delve into the specific factors influencing the decision-making process for surgery within different age brackets, contributing to more targeted treatment strategies.

Acknowledge the diverse distribution of surgical procedures, with bypass surgery being the most prevalent. Consider further research into the efficacy and long-term impacts of different surgical interventions, particularly in correlation with quality of life and functional recovery outcomes. This exploration could inform clinicians about the most effective interventions for specific patient profiles.

Recognize the heterogeneity in lesion duration among patients. Use this information to tailor treatment plans based on individual cases, considering potential variations in responses to surgical procedures. Investigate correlations between lesion duration and the effectiveness of surgical interventions, contributing to a more nuanced understanding of factors influencing treatment outcomes.

Emphasize the significant improvement in quality-of-life post-surgery, as evidenced by the statistically significant mean difference in QOL scores. This information is crucial for both clinicians and patients, highlighting the broader benefits of surgical intervention beyond functional recovery. Encourage the integration of QOL assessments into routine clinical practice to better capture the holistic impact of interventions.

Advocate for further research to explore the nuances in outcomes, particularly in variables where there is variability among patients, such as fatigue during exercise. Understanding these nuances can lead to more personalized and effective treatment approaches.

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## CONFLICTS OF INTEREST

No conflicts of interest have been declared by the authors.

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