

ORIGINAL ARTICLE

Life Satisfaction in Patients with Critical Limb Ischemia Following Vascular Surgery and Endovascular Therapy

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The most severe form of peripheral arterial disease, known as chronic limb-threatening ischaemia (CLTI), affects the blood supply to the extremities. Patients with CLTI have a worse chance of survival and are more likely to develop serious co-morbidities. Since these patients would be dealing with chronic ischemic discomfort, wounds, and other medical issues, it is predicted that their health-related quality of life (HR-QOL) will be negatively impacted. [2,3] The likelihood of amputation is higher in people with CLTI. In order to alleviate ischemic symptoms and save afflicted limbs, revascularization techniques including endovascular therapy (EVT) or surgical reconstruction are required. [1]

Reducing ischemic pain and promoting healing of ischemia wounds are essential tenets of treatment for CLTI, which helps patients retain mobility and HR-QOL. When determining the most effective course of therapy, it is critical to take into account how the operation will affect HR-QOL. Assessment of HR-QOL using tools like the SF-12 and the Vascular Quality of Life Inventory is encouraged by the global vascular guideline (GVG) in trial designs (VascuQOL). 1 Patency, limb salvage, and mortality rates are all physician-oriented outcomes that have typically been used to evaluate clinical results following revascularization. Few studies have used measures to assess HR-QOL in patients with CLTI. [4,5]

Patients with Rutherford categories 4–6 critical limb ischemia require intervention, which can take the form of percutaneous transluminal angioplasty (PTA), peripheral bypass surgery, or, if neither of these options is feasible, primary amputation or palliation. Walking distance, patency rates, limb salvage rates, and operation mortality are typical reported results of vascular treatments. The results may, however, be skewed toward the perspective of physicians. The importance of improved quality of life (QoL) as a result of vascular treatments is being recognised more and more. [1,5] In accordance with the World Health Organization's definition of health, this means taking a look at how

you are doing in terms of your body, mind, and relationships. [6] Quality of life takes into account how a patient experiences and interprets their illness and ability to function. [7]

Because of its location, the superficial femoral artery (SFA) is at a high risk for developing atherosclerotic vascular disease. The SFA travels through a fibromuscular canal, putting it in a position where it is subjected to considerable flexion, extension, shortening, and twisting stresses. Chronic vascular damage from cyclic deformation, strain, and cellular growth is caused by the SFA's specific anatomical position and the related mechanical stresses, as shown in [8]. [9] Because of the reduced patency rates recorded with percutaneous transluminal angioplasty in TASC II class D SFA occlusions, surgical bypass is often the first-line revascularization method (PTA). [10] Recent developments in endovascular technology, however, have allowed PTA in TASC II C/D lesions to achieve and even surpass 80-90% success rates. [11] For this reason, several researchers have shown that PTA in SFA stenosis has a similar patency rate to surgical revascularization. [12] There is a dearth of information, however, on how these two revascularization approaches affect quality of life. Patients undergoing revascularization of the superficial femoral artery (SFA) for critical limb ischemia were surveyed before and after treatment to see whether method resulted in a better quality of life (QoL) as judged by the Nottingham Health Profile (NHP).

MATERIAL AND METHODS

This prospective study was conducted at Dow International Medical College and Dow University of Health Sciences, OJHA Campus, Karachi in the period from April, 2022 to September, 2022 and comprised of 90 patients. Patients who had revascularization attempts fail or who declined to participate in the trial were not included.

Participants in this single-center trial were patients with critical limb ischemia caused by severe peripheral arterial disease of the SFA or popliteal artery who had successful revascularization

via surgical revascularization or percutaneous transluminal angioplasty. A success rate of revascularization was determined to be 0.15 by comparing the ABI prior to and after the surgery. Individuals' demographic and clinical data were collected prior to their participation. Both antegrade and retrograde PTA treatments were performed consistently by the same interventional team. Calibration techniques were used to gain highly accurate measurements of the lesion's length and the vessel's diameter. Lesions were crossed with the use of a hydrophilic flexible hose and an angled, tapered catheter. Every PTA treatment used drug-coated balloons with diameters appropriate for the artery being treated. After balloon angioplasty, only lesions generating flow-limiting dissections were candidates for rescue stenting. All patients were given a loading dosage of 300 mg clopidogrel, followed by 75 mg once daily for four weeks, in addition to the long-term aspirin and statin treatment they were already taking.

In arterial bypass surgeries, grafts made of polytetrafluoroethylene (PTFE) or reversed auto genous saphenous veins were employed. The common femoral artery was usually anastomosed to the popliteal artery above the knee, whereas in a minority of cases the tibial artery was used. All patients who underwent bypass surgery were put on a lifelong regimen of aspirin and statins.

All subjects were assessed 3 months after revascularization using the standardised ABI, 6-minute walking test, and NHP. To measure and analyse health-related quality of life, researchers created the National Health Interview Survey (NHIS) questionnaire. The NHP has been found to be reliable in verifying diagnoses and setting apart patients with varying health issues. The instrument generates an overall score in addition to scores for two domains and twelve categories. There are 38 yes/no questions in the first half of the survey, and they cover topics including pain, mobility, emotional reactivity, energy, social isolation, and sleep. The second section of the profile asks whether the respondent is having issues in several aspects of their lives, including but not limited to their paid employment, housekeeping, family relationships, social life, sex life, hobbies, and holidays. A total score out of 100 is possible depending on how well you do on the Turkish weighted items. A low number indicates that there are no problems in that area, whereas a high score indicates that there are major problems.

Patients who underwent surgical revascularization and those who underwent endovascular revascularization were compared with respect to the difference in NHP scores at the third post-procedural month. Variations in ABI were the major end point, while 6-minute walk distance was a secondary consequence.

The data was analysed with SPSS 22.0. To ensure normality, the Shapiro-Wilk test was used. Statistics are presented as means, standard deviations, or medians (lowest and highest values) for continuous variables with a normal distribution, and as frequencies (percentages) for categorical variables with a normal distribution.

RESULTS

The mean age of the included cases in group I was 64.6±5.57 years and in group II mean age was 69.5±8.44 years. There were majority males 33 (73.3%) in group I and 36 (80%) in group II. Comorbidities were DM, HTN, Hyperlipidemia and CAD among all cases. 24 cases in group I and 22 cases in group II underwent for only superficial femoral artery.(table 1)

Table-1: Data on the enrolled cases' demographics and other characteristics

Variables	Group I	Group II
Mean age (years)	64.6±5.57	69.5±8.44
Gender		
Male	33 (73.3%)	36 (80%)
Female	12 (26.7%)	9 (20%)
Comorbidities		
DM	12 (26.7%)	9 (20%)
HTN	17 (37.8%)	15 (33.3%)

Hyperlipidemia	10 (22.2%)	13 (28.9%)
CAD	6 (13.3%)	8 (17.8%)
Localization		
superficial femoral artery+popliteal	21 (46.7%)	23 (51.1%)
superficial femoral artery	24 (53.3%)	22 (48.9%)

ABI and 6-minute walking distance improved significantly three months after the treatment in both groups. At six months post-procedure, both groups had similar NHP Part I and Part II total scores.(table 2)

Table-2: Measurements and scale scores for patients summarized by treatment modality

Variables	Group I	Group II
6-minute walking distance		
Pre-Procedure	220 (120 - 250)	230 (120 - 250)
Post-Procedure	510 (130-500)	470 (130-500)
ABI		
Pre-Procedure	0.55±2.46	0.57±6.80
Post-Procedure	0.89±1.22	0.77±1.75
NHP-1		
Energy level	99.9±1.20	99.9±1.20
Physical abilities	75.6±3.42	55±8.90
Social isolation	79.2±10.18	24±7.69
Pain	74.7±3.87	70.2±7.25
Sleep	60.28±32.78	60.28±32.78
NHP-2		
Vacations	8 (17.8%)	12 (26.7%)
Sex life	9 (20%)	6 (13.3%)
Home life	6 (13.3%)	8 (17.8%)
Looking after the home	7 (15.6%)	9 (20%)
Work	15 (33.3%)	10 (22.2%)

We found that the surgical revascularization group had substantially higher domain scores in social isolation and physical abilities with p value <0.012.(Table 3)

Table-3: Comparison of outcomes among both groups

Variables	Group I	Group II
Overall		
Social Isolation	79.12±12.39	25.8±15.36
Physical abilities	80.2±6.90	57.8±9.44

DISCUSSION

In this study, we show that patients receiving surgical or PTA revascularization have comparable total NHP scores. The NHP indicated significantly higher scores in the social isolation and physical ability domains in patients who had surgical revascularization. At post-procedural evaluation, both revascularization techniques resulted in statistically significant increases in ABI and 6-minute walking distance. These results show that patients receiving SFA revascularization for critical limb ischemia experience similar improvements in QoL regardless of the revascularization strategy used.

In current study 90 patients were included. The mean age of the included cases in group I was 64.6±5.57 years and in group II mean age was 69.5±8.44 years. There were majority males 33 (73.3%) in group I and 36 (80%) in group II. Comorbidities were DM, HTN, Hyperlipidemia and CAD among all cases. These results were comparable to the previous study.[13] All consecutive patients who underwent revascularization were analyzed, and the quality-of-life (QOL) improvements associated with survival served as the study's primary outcome. Patients who survived longer after a CLTI would likely be less frail, have less severe comorbidities such as cardiovascular disease or renal failure, and be in a better health status, hence there may be substantial selection biases in assessing the HR-QOL of these patients. Despite the availability of several risk stratification models for life expectancy, physicians are unable to predict mortality in each patient prior to surgery. [14,15] The Wifl categorization was also proposed as part of a risk score calculated from pre-operative factors. 16 However, as stated by the GVG, no one model can be suggested at this time. [16] So, at

each stage of the research, we looked into what proportion of patients, including those who had passed away, still had some measure of their QOL intact.

Pain in the legs is a common symptom of peripheral artery disease, and it can interfere with both resting and active activities, making it difficult for people with PAD to do daily tasks and limit their mobility. [17] Thus, those who suffer from peripheral artery disease are said to have a lower HRQoL than those who are considered healthy. According to the Edinburgh Artery Study, patients with intermittent claudication have a lower HRQoL due to their deteriorating physical health, while those with asymptomatic peripheral arterial disease have a higher HRQoL. [18] Low health-related quality-of-life (HRQoL) is not just correlated with a lower chance of survival, but is primarily a reflection of how one feels. Additionally, some studies have shown that those with peripheral artery disease have lower HRQoL scores than those with coronary artery disease and congestive heart failure. [19] For instance, after accounting for other known prognostic markers, Issa and coworkers found that patients receiving vascular surgery for peripheral artery disease had a higher HRQoL after the procedure. [20]

In current study, we found that the surgical revascularization group had substantially higher domain scores in social isolation and physical abilities with p value <0.012. Results were comparable to the previous studies. [21,22] The current study demonstrates that after 3 months post-revascularization, the ABI is higher with surgical bypass than via PTA. However, in terms of 6-minute walk distance improvement, both revascularization techniques perform similarly. Individuals treated for critical limb ischemia with surgical bypass or PTA exhibit identical QoL at 3 months following revascularization, with the exception of the social isolation and physical ability categories (where PTA subjects fare better).

CONCLUSION

Our findings indicate that patients undergoing surgical revascularization or PTA for SFA stenosis have comparable overall scores on the NHP questionnaire three months after revascularization. Subjects who undergo surgical revascularization score significantly higher than those who undergo percutaneous transluminal angioplasty (PTA) on the NHP's social isolation and physical ability dimensions.

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