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Identification of Risk Factors and Survival in Patients Undergoing Re-amputation After Extremity Amputation

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What is already known on this topic?

- *Patients undergoing lower extremity amputation due to diabetes mellitus (DM) or peripheral artery disease (PAD) face significant risks of re-amputation, postoperative complications, and mortality.*
- *While re-amputation does not independently impact overall survival, it significantly reduces prosthetic fitting rates, compromising rehabilitation and long-term functional independence.*

What this study adds on this topic?

- *High Risk of Re-Amputation and Mortality in PAD-TFA Patients. This study identifies PAD patients with transfemoral amputations (TFA) as the highest-risk subgroup, exhibiting the lowest one-year survival rates (55%) and the highest re-amputation rates (33%).*
- *Impact and timing of re-amputation on Functional Outcomes. Given that most re-amputations occur within 6 weeks postoperatively, early postoperative monitoring is crucial to improving patient outcomes.*
- *Predictors of Poor Prognosis. The study confirms that advanced age, ASA-4 classification, and hypoalbuminemia are key predictors of mortality, reinforcing the need for targeted perioperative interventions. Additionally, wound healing complications and infections (MRSA and Pseudomonas aeruginosa) are primary contributors to re-amputation, emphasizing the importance of infection control and multidisciplinary perioperative care.*

Abstract

Objective: This study aimed to identify the risk factors contributing to re-amputation, survival rates, and mortality determinants in patients who underwent unilateral lower extremity amputation due to diabetes mellitus (DM) or peripheral artery disease (PAD).

Methods: This retrospective study included 93 patients who underwent amputation due to DM (62) or PAD (31). Data regarding the etiology and level of amputation, comorbidities, ASA scores, postoperative intensive care unit (ICU) admission, ICU length of stay, re-amputation rates, factors necessitating re-amputation, wound culture results, time to re-operation, survival status, and duration were analyzed.

Results: PAD patients were older ($P = .019$), had fewer comorbidities than DM patients ($P < .001$), and predominantly underwent transfemoral amputation (TFA) (64.5%). The re-amputation rate was 32.6%, with a median interval of 6 weeks, driven by wound healing complications (64.5%). The median survival duration was 6 months (range 1–29 months). PAD-TFA patients had the highest re-amputation rates and the lowest 1-year survival. Independent mortality predictors included advanced age ($P = .003$), ASA-4 status ($P = .018$), and hypoalbuminemia ($P = .032$). Re-amputation did not independently affect survival ($P = .213$) but significantly reduced prosthetic fitting rates ($P = .005$).

Conclusion: Patients undergoing amputation for chronic lower extremity circulatory issues should be closely monitored for wound problems, particularly during the first 6 weeks postoperatively. PAD-TFA patients represent the highest-risk subgroup. The poor prognostic factors for survival include advanced age, ASA-4 status, and hypoalbuminemia. Furthermore, the significantly older age of PAD patients highlights the importance of addressing diabetes as a critical health concern across all age groups.

Keywords: Re-amputation, mortality, lower extremity amputation, ASA score, peripheral artery disease, diabetes mellitus

Introduction

Diabetes mellitus (DM) is a growing global health challenge, with its prevalence increasing 4-fold from 1980 to 2014.[1,2] By 2021, 537 million people (10.5% prevalence) were affected, with projections estimating 783 million cases by 2045.[1,3] Peripheral artery disease (PAD) accounts for 51–93% of lower limb major amputations, though incidence varies globally. The prevalence of PAD is increasing as well.[4–7] PAD is a growing global health concern, mostly attributed to an aging population, tobacco use, lifestyle choices, and a rising incidence of diabetes mellitus.[8] The majority of significant lower limb amputations are associated with PAD or diabetes.[9] The risk of subsequent amputation following an initial amputation is notably high and a serious complication.[10] Factors such as infections, wound dehiscence, issues related to uncontrolled metabolic status or poor nutritional levels, smoking, high age, low transcutaneous oximetry, diabetes, renal insufficiency, and prior revascularization are often responsible for the need for revision surgery.[11] These revisions hinder functional rehabilitation, extend hospital stays, and are associated with significant morbidity and mortality.[12]

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This study sought to identify the risk factors associated with re-amputation, survival outcomes, and mortality determinants in individuals who underwent unilateral lower extremity amputation as a result of DM or PAD.

Methods

This retrospective cohort study was undertaken at our hospital, examining patients who underwent unilateral lower extremity amputation from January 2015 to December 2022. The research complied with the Declaration of Helsinki and was approved by the İstanbul University-Cerrahpaşa (Approval no: 1178504, Date: December 19, 2024). The study protocol maintained confidentiality and adhered to local legislation for the utilization of patient data for research purposes.

A total of 93 patients who received lower extremity amputation as a result of DM or PAD were included. Patients were excluded for having bilateral amputations, inadequate medical data, or amputations resulting from causes other than diabetes mellitus or peripheral artery disease (e.g., trauma, malignancy), or for not undergoing regular examinations. A power analysis performed with G*Power (Version 3.1.9.6) was conducted to assess the sufficiency of the sample size for this investigation. The required sample size, with an effect size of 0.5 (medium), an alpha level of 0.05, and a power of 80% ($\beta = 0.20$), was determined to be 85 patients. The inclusion of 93 patients surpassed this threshold, signifying adequate statistical power to identify significant differences in re-amputation rates and survival outcomes among patient groups. Patient data were obtained from hospital computer records and encompassed demographics (age and gender), amputation cause (diabetes mellitus or peripheral artery disease), comorbidities, American Society of Anesthesiologists (ASA) physical status classification ratings, and postoperative outcomes.

To investigate the variations in outcomes according to amputation level and cause, patients were classified into 3 subgroups depending on the amputation level: transfemoral amputation (TFA), transtibial amputation (TTA), and below-ankle amputation (BAA). The subgroups were subsequently differentiated by etiology, distinguishing between diabetes mellitus (DM) and peripheral arterial disease (PAD). Comparative studies were performed to evaluate differences in demographic parameters, re-amputation rates, survival outcomes, ICU admission rates, and postoperative complications among these groupings.

The principal variables evaluated in this study were as follows: Re-Amputation Rates: This included the frequency of recurrent amputations and the timing of these subsequent procedures following the initial amputation. Wound Culture Results: Microbial data were obtained from cultures collected during episodes of wound complications to identify infectious agents. Postoperative Course: Variables such as admission to the intensive care unit (ICU), the duration of ICU stays, and the survival outcomes of the patients were assessed. Survival Analysis: The duration of survival following the initial amputation was evaluated to identify factors influencing long-term outcomes. Re-amputation was characterized as any surgical excision of a portion of the afflicted limb subsequent to the initial procedure. Patients were categorized into groups according to etiology (diabetes mellitus vs. peripheral artery disease), re-amputation status (yes vs. no), and survival status (living vs. died). The principal outcomes were determinants affecting re-amputation and overall survival rates. Secondary outcomes encompassed factors influencing death and intensive care unit requirements.

We, as orthopedic surgeons, perform the amputation process. Postoperative consultations were conducted with physical therapy and rehabilitation specialists for prompt rehabilitation. Preoperative antibiotic prophylaxis consisted of 2 g of cefazolin sodium, administered prior to general anesthesia and no more than 1 hour before the surgery. In cases of an allergy to cefazolin, 600 mg of clindamycin was administered as an alternative. Tourniquets were not employed during surgery for any patients, and surgical procedures began at the specified degree of amputation, remaining consistent throughout the operation for all patients. Following the osteotomy and excision of the amputated limb, the myodesis technique was executed as an integral component of the surgical protocol. The closure techniques differed based on the amputation level. Skin closure was accomplished via staples. Hemovac drainage was utilized intraoperatively and was removed either after 24 hours or when drainage diminished to below 50 cm^3 per day. Postoperative infectious disease consultations directed antibiotic medication for each patient. Post-surgery, hospitalized patients were subjected to continuous monitoring, whereas discharged individuals attended weekly outpatient follow-ups for wound evaluation throughout the first 3 weeks postoperatively. The removal of stitches was scheduled for the third week. General controls were performed in the 6th and 12th weeks, as well as at the 6th and 12th months postoperatively.

Statistical Examination

Statistical analyses were performed using IBM SPSS Statistics (version 24.0). Continuous variables were expressed as means ± standard deviations or medians with interquartile ranges (IQR), depending on their distribution. Categorical variables were presented as frequencies and percentages. Statistical significance was set at a *P*-value < .05. The Shapiro-Wilk test was employed to assess the normality of continuous variables. For normally distributed data, the independent samples t-test was used for comparisons between 2 groups (e.g., DM vs. PAD). For data not following a normal distribution, the Mann-Whitney U test was applied. For comparisons across 3 or more groups (e.g., TFA, TTA, BAA subgroups), one-way analysis of variance (ANOVA) was used for normally distributed variables, with post hoc Tukey's HSD tests for multiple comparisons. For non-parametric variables, the Kruskal-Wallis test was employed, followed by pairwise comparisons using Dunn's test with Bonferroni correction. The chi-square test or Fisher's exact test (where appropriate) was utilized for comparisons between categorical variables. For comparisons across multiple groups, the chi-square test for independence was used, with adjusted residuals analyzed for subgroup differences. Kaplan-Meier survival curves were constructed to evaluate survival durations stratified by etiology (DM vs. PAD) and amputation subgroups (TFA, TTA, BAA). The log-rank test was used to compare survival distributions across subgroups. Multivariate logistic regression was conducted to identify independent predictors of re-amputation (considering variables such as age, ASA score, etiology, and comorbidities), ICU admission (analyzing predictors like age, ASA score, amputation level, and complications), and prosthetic fitting at 1 year (adjusting for re-amputation status, age, and etiology). Cox proportional hazards regression was used to identify predictors of mortality, with hazard ratios (HR) and 95% confidence intervals (CI) reported. Bonferroni correction was applied to adjust for multiple comparisons in post hoc tests.

Results

A total of 93 patients underwent unilateral lower extremity amputation due to diabetes mellitus (DM, n = 62, 66.7%) or peripheral arterial disease (PAD, n = 31, 33.3%). The average age of PAD patients (67.3 ± 11.2 years) was significantly higher than that of DM patients (58.6 ± 9.8 years; $P = .019$). Male patients represented 72.0% of the study population. Comorbidities were more common among DM patients (87.1% vs. 54.8%; $P < .001$), with hypertension (68.8%), coronary artery disease (52.6%), and chronic kidney disease (39.8%) being the most prevalent.

Amputations were categorized as transfemoral (TFA, n = 33, 35.5%), transtibial (TTA, n = 46, 49.5%), or below-ankle (BAA, n = 14, 15%). Distribution differed significantly between DM and PAD groups ($P = .014$). TFA was predominant in PAD patients (64.5%, n = 20) compared to DM patients (21%, n = 13). TTA was more frequent in DM patients (58%, n = 36) than PAD patients (32.3%, n=10). BAA was almost exclusive to DM patients (21%, n = 13 vs. 3.2%, n = 1 for PAD) (Figure 1).

The overall re-amputation rate was 32.6% (n = 31), with the highest rates observed in PAD-TFA patients (n = 11), followed by DM-TTA (n = 9), DM-TFA (n = 5), PAD-TTA (n = 3), and DM-BAA (n = 3). No re-amputations occurred in the PAD-BAA group (Figure 2). The median time to re-amputation was 6 weeks (IQR: 4–10 weeks), shortest in PAD-TFA patients (4.8 weeks, IQR: 3–8). Primary reasons for re-amputation were wound healing complications (64.5%) and infections (35.5%), with Methicillin-resistant *Staphylococcus aureus* (MRSA, 42.9%) and *Pseudomonas aeruginosa* (28.6%) being the most common pathogens. There were no significant differences between patients requiring re-amputation and those who did not in terms of demographics, comorbidities (e.g., chronic kidney disease, coronary artery disease, neurological disorders, and chronic lung disease), hypoalbuminemia, ASA scores, or ICU admission ($P > .05$). However, those factors were higher in the re-amputation group despite being insignificant.

The median survival duration post-amputation in deceased patients was 6 months (range: 1–29 months). One-year survival rates varied significantly among subgroups: PAD-TFA (55%), DM-TFA (69.2%), PAD-TTA (70%), DM-TTA (77.8%), and BAA (93%) (Figure 3). Deceased patients were significantly older (71.4 ± 10.2 years vs. 58.9 ± 9.5 years; $P = .02$) and had higher rates of neurological disorders (46.7% vs. 19.2%; $P = .02$) and hypoalbuminemia (78.3% vs. 41.7%; $P = .02$). Multivariate logistic regression identified advanced age (OR: 1.54 per decade, $P = .003$), ASA-4 classification (OR: 2.82, $P = .018$), and hypoalbuminemia (OR: 1.96, $P = .032$) as independent predictors of mortality. Re-amputation did not independently affect survival ($P = .213$), and re-amputation did not significantly affect survival rates. Postoperative ICU admission was required in 24.7% (n = 23) of patients, with an average ICU stay of 5.2 ± 2.8 days. ICU admission

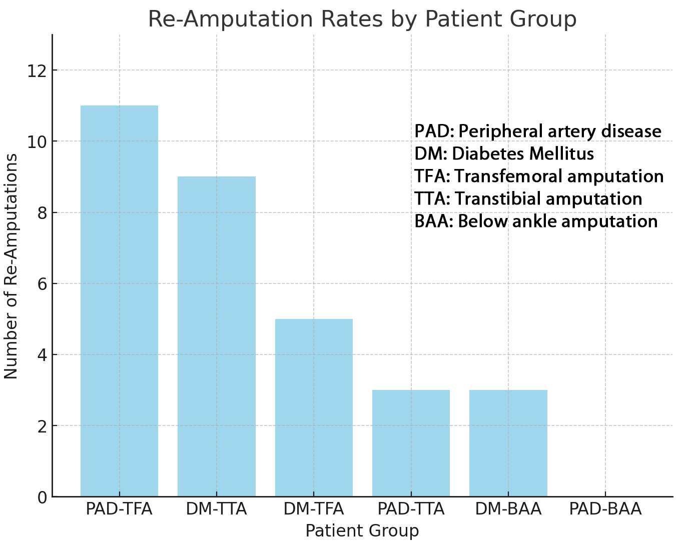

Figure 2. Re-amputation rates by patient group. This bar chart displays the re-amputation rates across different amputation subgroups. The highest re-amputation rate was observed in PAD-TFA patients (n=11), followed by DM-TTA (n = 9), DM-TFA (n = 5), PAD-TTA (n = 3), and DM-BAA (n = 3). No re-amputations were recorded in the PAD-BAA group.

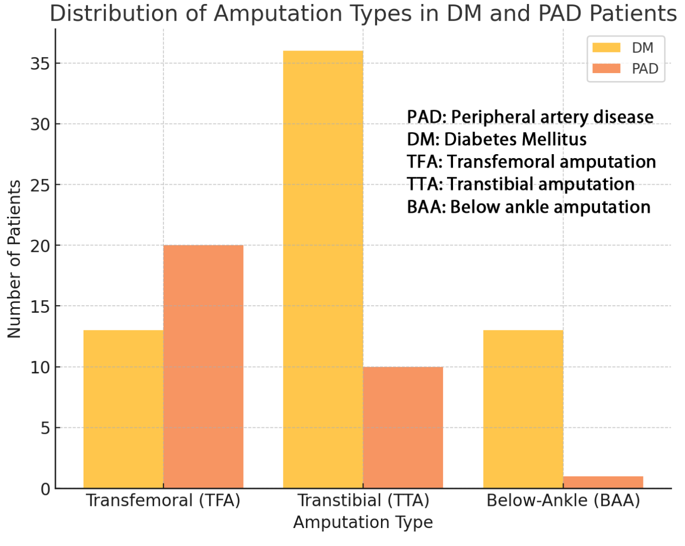

Figure 1. Distribution of amputation types in DM and PAD Patients. This bar chart illustrates the distribution of amputation types in patients with diabetes mellitus (DM) and peripheral arterial disease (PAD). The number of patients undergoing transfemoral (TFA), transtibial (TTA), and below-ankle amputations (BAA) is compared between DM and PAD groups. TFA was more common in PAD patients, whereas TTA was more common in DM patients and BAA was predominantly seen in DM patients.

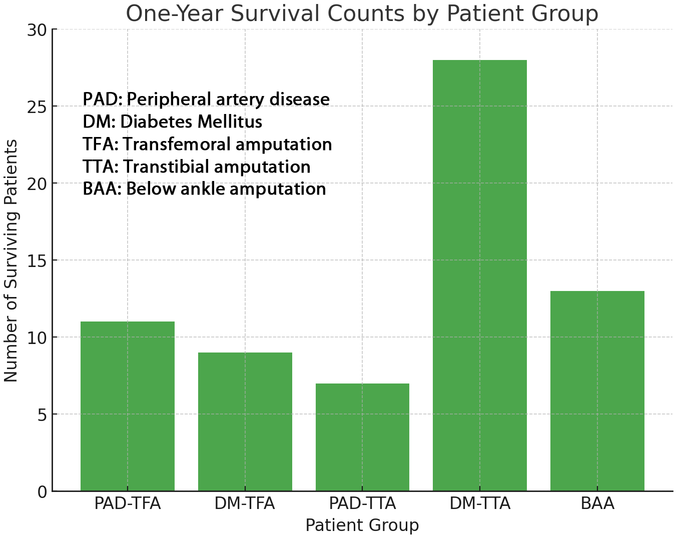

Figure 3. One-year survival counts by patient group. This bar chart presents the 1-year survival count for each amputation subgroup based on patient numbers. The highest survival rate was seen in the BAA group (n = 13 out of 14 patients), followed by DM-TTA (n = 28 out of 36 patients), PAD-TTA (n = 7 out of 10 patients), DM-TFA (n = 9 out of 13 patients), and PAD-TFA (n = 11 out of 20 patients). The survival rates significantly varied among groups.

was significantly more frequent in PAD-TFA patients (55%, n = 11) compared to others (*P* = .027) and was strongly associated with advanced age (69.1 ± 9.3 years vs. 60.4 ± 10.8 years; *p*=0.006) and higher ASA scores (ASA-4: 39.1% vs. 12.5%; *P* = .012).

Postoperative complications included stump infections, delayed wound healing, and deep vein thrombosis. Stump infections and wound healing problems were most common in PAD-TFA patients (45%). At 1-year follow-up, the prosthetic fitting rate was 43.1% (n = 40) and significantly lower in patients requiring re-amputation (19.4%, n = 6) compared to those without re-amputation (54.8%, n = 34; *P* = .005). Tables 1 and 2 summarize all key findings.

Table 1. Summary of Key Findings

Category	Value
Total patients	93
Diabetes mellitus (DM) patients (%)	62 (66.7%)
Peripheral artery disease (PAD) patients (%)	31 (33.3%)
Average age for DM (years)	58.6 ± 9.8 (*P* = .019)
Average age for PAD (years)	67.3 ± 11.2 (*P* = .019)
Male patients (%)	67 (72.0%)
Female patients (%)	26 (28.0%)
Comorbidities (DM vs PAD)	87.1% vs 54.8% (*P* < .001)
Hypertension (%)	68.8%
Coronary artery disease (%)	52.6%
Chronic kidney disease (%)	39.8%
Transfemoral amputation (TFA)	33 (35.5%)
Transtibial amputation (TTA)	46 (49.5%)
Below-ankle (BAA)	14 (15%)
Overall re-amputation rate (%)	31 (32.6%)
Highest re-amputation (group)	PAD-TFA (11 patients)
Median time to re-amputation (weeks)	6 (IQR: 4–10)
Shortest time to re-amputation (weeks)	PAD-TFA 4.8 (IQR: 3–8)
Median survival duration (months)	6 (1-29)
1-Year survival rate (PAD-TFA)	55%
1-Year survival rate (DM-TFA)	69.2%
1-Year survival rate (PAD-TTA)	70%
1-Year survival rate (DM-TTA)	77.8%
1-Year survival Rate (BAA)	93%
ICU admission (%)	24.7%
ICU stay (days)	5.2 ± 2.8
Prosthetic fitting rate total (%)	40 (43.1%)
Prosthetic fitting rate re-amputation (%)	6 (19.4%)
Prosthetic fitting rate non-re-amputation (%)	34 (54.8%)

Discussion

This study thoroughly assessed 93 patients who experienced unilateral lower extremity amputations resulting from diabetes mellitus (DM) or peripheral artery disease (PAD), highlighting notable disparities in demographics, clinical attributes, and prognosis. Patients with PAD were significantly older and exhibited lower comorbidity rates than those with DM. Amputation forms differed markedly among groups, with patients suffering from PAD primarily receiving transfemoral amputations (TFA), whereas below-ankle amputations (BAA) were almost exclusively performed on DM patients. The re-amputation rate was highest among PAD-TFA patients and lowest among PAD-BAA patients, highlighting the relationship between etiology and amputation level in influencing outcomes. Complications in wound healing and infections, especially those associated with Methicillin-resistant Staphylococcus aureus (MRSA) and Pseudomonas aeruginosa, were primary contributors to re-amputation. Survival study revealed that PAD-TFA patients experienced the lowest survival rates, whilst BAA patients showed the most favorable outcomes. Advanced age, ASA-4 classification, and hypoalbuminemia were significant death predictors. Furthermore, postoperative ICU admissions and sequelae, including stump infections, were more prevalent in PAD-TFA patients, underscoring their heightened risk profile. These findings underscore the necessity for customized therapies aimed at high-risk categories, including PAD-TFA patients, to enhance outcomes and diminish postoperative morbidity.

In a Danish study by Brix et al, they also found the re-amputation rate similar to ours, at 29%. In their study, dyslipidemia, renal insufficiency, and prior vascular surgery were associated with a higher risk of re-amputation. In contrast to our findings, they find TTA more risky for re-amputation than TFA.[11] In a study by Liu et al. the incidence of lower extremity re-amputation was found to be high among patients with DM who had undergone initial amputations secondary to DM.[10] Abry et al. stated that mortality was higher with higher amputation levels in the lower extremity and emphasized the shift to endovascular treatment before the major amputation.[6] In a study by Fard et al., the first-year mortality rate following major lower limb amputation (LLA) was reported to be particularly high among patients undergoing TFA, likely reflecting the severity of underlying vascular disease, as in our study. The study also highlighted that advanced age, severe cardiac conditions, and hemodialysis were significant contributors to increased mortality, underscoring the frailty of this patient population. Notably, factors such as diabetes mellitus, prior revascularization, and a history of minor or major LLA were not found to be associated with mortality rates.[13] In a study by Scott et al., mortality following lower limb amputation was found to be associated with factors such as patient age, ASA classification, out-of-hours surgery, and renal dysfunction. The authors emphasize the importance of performing lower limb amputations during daytime hours and addressing modifiable risk factors to potentially improve outcomes.[14] Our findings are in some manners consistent with these findings, especially regarding mortality rates in TFA, ASA, and advanced age status.

The surgical technique and level of amputation play a significant role in patient outcomes. Shevchuk et al. demonstrated that non-free dermal plasty with a cutaneous-subcutaneous flap can enhance residual limb quality by improving bone stability and muscle elasticity, which may reduce complications.[15] Thorud et al. challenged the routine selection of transmetatarsal amputations, suggesting that partial first-ray amputation may be preferable depending on individual patient factors, reinforcing the importance of patient-specific surgical planning.[16] Re-amputation

Table 2. ***P*-Values and Associated Parameters Between Groups**

Parameter	Higher in	*P*-value
Age (PAD vs. DM)	PAD	**.019**
Comorbidities (DM vs. PAD)	DM	**<.001**
Amputation distribution (DM vs. PAD)	DM	**.014**
Survival age (deceased vs. living)	Deceased	**.02**
Neurological disorders (deceased vs. living)	Deceased	**.02**
Hypoalbuminemia (deceased vs. living)	Deceased	**.02**
Advanced age	Mortality predictor	**.003**
ASA-4 classification	Mortality predictor	**.018**
Hypoalbuminemia	Mortality predictor	**.032**
Re-amputation and survival	Not mortality predictor	.213
ICU admission (PAD-TFA vs. others)	PAD-TFA	**.027**
ICU Admission (Advanced Age vs. Younger)	Advanced Age	**.006**
ICU admission (ASA-4 vs. lower ASA scores)	ASA-4	**.012**
Prosthetic fitting (re-amputation vs. non-re-amputation)	Non-re-amputation	**.005**

< .05 for significance.

remains a critical concern. Correa et al. reported a 48% re-amputation prevalence, with toe amputations being the most commonly re-operated minor amputation and above-knee amputations being the most frequent re-amputation level.[17] Primadhi et al. recommended ray amputation over metatarsophalangeal joint disarticulation to reduce the risk of early re-amputation, emphasizing the importance of surgical technique selection in minimizing subsequent procedures.[18] Czerniecki et al proposed a prediction model to assess primary healing failure risk and the likelihood of re-amputation, which could assist surgeons in determining the optimal amputation level for each patient.[19] Several patient-related factors contribute to re-amputation risk. Seckin et al. identified low albumin levels, smoking, hypertension, long diabetes duration, and multiple post-surgical debridements as significant predictors of re-amputation in diabetic foot patients.[20] Similarly, as mentioned before, Fard et al. confirmed that TFA patients exhibit the highest mortality risk, reflecting the severity of their underlying vascular disease. Interestingly, their study found that DM status, prior revascularization, and previous amputations were not directly associated with mortality rates, highlighting the complex interplay of patient comorbidities in survival outcomes.[13]

In a study, non-compliance with multidisciplinary consultation (MDC) recommendations was strongly associated with an increased likelihood of revisions, whereas adherence significantly reduced the necessity for such procedures.[21] In another study, depression is linked to early postoperative mortality after amputation. They put an emphasis on multidisciplinary neuropsychiatric evaluation preoperatively to enhance patient care and outcomes.[1] Zambetti et al. reported that while 30-day re-amputation rates are relatively low, they are associated with considerable morbidity, extended hospital stays, and frequent readmissions, highlighting the substantial burden on healthcare systems and patient recovery.[22] Geurts et al. observed that ipsilateral re-amputation within 1 year following the initial amputation is a frequent occurrence, with several risk factors contributing to its prevalence. Although 30-day and 1-year mortality rates were high, no significant differences were observed beyond the first year. The study highlights the need for the development of a clinical decision-making tool tailored for dysvascular patients to enhance shared decision-making, reduce re-amputation rates, and improve overall survival.[23] Swaminathan et al. reported that the mortality rate following major lower extremity amputation (LEA) in the United States is approximately 48% at 1 year and 71% at 3 years. These findings highlight the need for strategies to improve outcomes in patients undergoing LEA due to peripheral artery disease.[24]

Zhang et al highlighted that frailty independently forecasts both short-term and long-term all-cause mortality but does not predict major amputation in patients with lower extremity PAD. Frailty status may significantly influence the risk stratification of lower extremity peripheral artery disease (PAD).[25] According to Wang et al, frailty was more prevalent among patients with lower extremity PAD, emphasizing the importance of evaluating frailty in this patient population.[26] In future research, the re-amputation rates and frailty have to be correlated.

Limitations

This study has several limitations. Its retrospective design may introduce biases in data accuracy and completeness, affecting generalizability. Being a single-center study, the findings may not apply to diverse populations with different healthcare settings. Although the sample size was sufficient for primary analyses, subgroup comparisons, particularly for below-ankle amputations (BAA), were limited due to small numbers. Larger studies are needed to validate these findings. Surgical technique variations, rehabilitation protocols, and prosthetic fitting could impact outcomes. Future studies should research these factors to better understand their effects on re-amputation and recovery. Unmeasured confounders such as socioeconomic status, treatment adherence, and prior vascular interventions could influence re-amputation and survival rates. Future research should account for these factors for a more comprehensive risk assessment. This study also did not evaluate long-term functional outcomes, quality of life, or patient-reported measures, which are essential for assessing the full impact of re-amputation. Future studies should integrate functional assessment tools and patient-reported outcomes to improve rehabilitation strategies. To overcome these limitations, future research should use multicenter, prospective designs with larger patient cohorts, standardized surgical and rehabilitation protocols, and long-term follow-up. These steps will improve the reliability and applicability of findings in lower extremity amputation research.

Conclusion

This study highlights the considerable influence of etiology and amputation level on the outcomes for individuals receiving unilateral lower extremity amputations. Patients undergoing amputation for chronic lower extremity circulatory issues should be closely monitored for wound problems, particularly during the first 6 weeks postoperatively. Patients with PAD, especially those undergoing transfemoral amputations, encounter elevated risks of re-amputation, postoperative complications, intensive care unit admissions, and diminished survival rates. Significant predictors of death, including advanced age, hypoalbuminemia, and heightened ASA classifications, underscore the imperative for comprehensive preoperative risk evaluation and multidisciplinary therapy. Furthermore, the significantly older age of PAD patients highlights the importance of addressing diabetes as a critical health concern across all age groups. Proactive perioperative interventions emphasizing wound healing, infection control, and customized rehabilitation are crucial for reducing risks and enhancing results in high-risk populations such as PAD-TFA patients. Future prospective research must focus on creating individualized treatment protocols and investigating methods to improve long-term functional outcomes and quality of life for these people.

Data Availability Statement: The data that support the findings of this study are available on request from the corresponding author.

Ethics Committee Approval: This study was approved by the İstanbul University-Cerrahpaşa (Approval no: 1178504, Date: December 19, 2024).

Informed Consent: There is no information (names, initials, hospital identification numbers, or photographs) in the submitted manuscript that can be used to identify patients.

Peer-review: Externally peer-reviewed.

Author Contributions: Concept – C.D.D., M.Y.A.; Design – C.D.D., M.Y.A.; Supervision – C.D.D.; Resources – C.D.D., M.Y.A.; Materials – C.D.D., M.Y.A.; Data Collection and/or Processing – C.D.D., M.Y.A.; Analysis and/or Interpretation – C.D.D., M.Y.A.; Literature Search – C.D.D., M.Y.A.; Writing Manuscript – C.D.D., M.Y.A.; Critical Review – C.D.D., M.Y.A.

Declaration of Interests: The authors have no conflict of interest to declare.

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