TURKISH JOURNAL OF CEREBROVASCULAR DISEASES

ORIGINAL ARTICLE

Turkish Journal of Cerebrovascular Diseases 2025; 31(2):108-113
doi: 10.5505/tjcvd.2025.08208

Factors Determining Prognosis in Patients Undergoing Thrombectomy for Basilar Artery Occlusion

Baziler Arter Oklüzyonu Nedeniyle Trombektomi Uygulanan Hastalarda Prognozu Belirleyen Faktörler

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ABSTRACT

Background: In this study, we aimed to investigate the factors that may affect the prognosis of patients who underwent endovascular treatment for basilar artery occlusion (BAO).

Methods: The data of patients admitted to the Dicle University Stroke Center between January 1, 2019, and April 1, 2024, were retrospectively analyzed. Patients with conditions that could affect prognosis, such as prior sequelae, malignancy, or receiving thrombolytic therapy before endovascular treatment, were excluded. A total of 38 patients met the inclusion criteria. The patients' admission and 24-hour post-procedure National Health Stroke Scale score (NIHSS), admission Glascow Coma Scale (GCS) score, basilar artery occlusion segments, Thrombolysis in Cerebral Infarction (TICI) recanalization score, 3-month modified Rankin score (mRS), and the number of PASS attempts performed for recanalization were evaluated. Additionally, preoperative lymphocyte, hematocrit, neutrophil counts, and neutrophil-to-lymphocyte ratios (NLR) were calculated. The relationships between these factors and prognosis and mortality were analyzed.

Results: In our study, which retrospectively evaluated a total of 38 patients, the factors statistically significantly associated with functional independence (mRS 0–3) at the 3-month mRS score were the admission NIHSS score, the 24-hour NIHSS score, and the number of PASS attempts performed for recanalization (P=.005, P<.001, and P=.048, respectively). mRS scores of 4–6 were considered functionally dependent. Based on the results of the ROC and multivariable logistic regression analyses, the preoperative NLR value appears to be an independent predictor of mortality (AUC: 0.898, P=.029, 95% CI=1.064-3.434). In both ROC and regression analyses, lymphocyte levels were not associated with mortality.

Conclusion: Although the number of patients in our study is limited, our results are consistent with many studies on EVT performed for BAO. Additionally, we believe that identifying the relationship between preoperative NLR and mortality is valuable. In this context, we hope that our study can shed new light on the pathophysiology of ischemic stroke and the evaluation of patient prognosis after EVT.

Keywords: Neutrophil/lympocyte ratio (NLR), basiler artery occlusion (BAO), endovascular treatment (EVT), BAO and prognosis.

ÖZ

Amaç: Bu çalışmada, baziler arter oklüzyonu (BAO) nedeniyle trombektomi uygulanan hastaların prognozunu etkileyebilecek faktörleri araştırmayı amaçladık.

Yöntemler: 1 Ocak 2019 ile 1 Nisan 2024 tarihleri arasında Dicle Üniversitesi Tıp Fakültesi İnme Merkezi'ne başvuran hastaların verileri retrospektif olarak analiz edildi. Eski sekel, malignite öyküsü veya endovasküler tedaviden önce trombolitik tedavi almış olmak gibi prognozu etkileyebilecek durumlara sahip hastalar çalışma dışı bırakıldı. Toplam 38 hasta dahil etme kriterlerini karşıladı. Hastaların kabul ve işlemden 24 saat sonra Ulusal Sağlık İnme Ölçeği (NIHSS) skoru, kabul Glasgow Koma Ölçeği (GCS) skoru, baziler arter oklüzyon segmentleri, Serebral Enfarkt Tromboliz (TICI) rekanalizasyon skoru, 3 aylık modifiye Rankin skoru (mRS) ve rekanalizasyon için gerçekleştirilen PASS girişimi sayısı değerlendirildi. Ayrıca, ameliyat öncesi lenfosit, hematokrit, nötrofil sayıları ve nötrofil-lenfosit oranları (NLR) hesaplandı. Bu faktörler ile prognoz ve mortalite arasındaki ilişkiler analiz edildi.

Bulgular: Toplam 38 hastanın retrospektif olarak değerlendirildiği çalışmamızda, 3. ay mRS skorunda fonksiyonel bağımsızlık (mRS 0-3) ile istatistiksel olarak anlamlı ilişkili faktörler; yatış NIHSS skoru, 24 saatlik NIHSS skoru ve rekanalizasyon için gerçekleştirilen PASS girişimi sayısıydı (sırasıyla P=.005, P<.001 ve P=.048). 4-6 arasındaki mRS skorları fonksiyonel olarak bağımlı kabul edildi. ROC ve çok değişkenli lojistik regresyon analizlerinin sonuçlarına göre, preoperatif NLR değeri mortalitenin bağımsız bir öngörücüsü gibi görünmektedir (AUC:0,898, P=.029, %95 CI=1,064-3,434). Hem ROC hem de regresyon analizlerinde lenfosit düzeyleri mortalite ile ilişkili bulunmadı.

Sonuç: Çalışmamızdaki hasta sayısı sınırlı olsa da, sonuçlarımız BAO için yapılan birçok EVT çalışmasıyla tutarlıdır. Ayrıca, ameliyat öncesi NLR ile mortalite arasındaki ilişkinin belirlenmesinin değerli olduğuna inanıyoruz. Bu bağlamda, çalışmamızın iskemik inmenin patofizyolojisine ve EVT sonrası hasta prognozunun değerlendirilmesine yeni bir ışık tutabileceğini umuyoruz.

Anahtar Kelimeler: Nötrofil lenfosit oranı (NLO), baziler arter oklüzyonu (BAO), endovasküler tedavi (EVT), BAO ve prognoz.

Cite this article as: Özbek M, Çetiner C, Gültekin H, Akıl E. Factors determining prognosis in patients undergoing thrombectomy for basilar artery occlusion. *Turk J Cerebrovasc. Dis.* 2025;31(2):108-113.

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Received: May 13, 2025 **Accepted:** July 28, 2025 **Publishing Date:** August 28, 2025

INTRODUCTION

The Basilar Artery (BA) is formed by the union of both vertebral arteries (VAs) at the level of the pons. The BA anatomically consists of 3 segments. The segment between the VA and the Anterior Inferior Cerebellar Artery (AICA) is defined as proximal segment, the segment between the AICA and the superior cerebellar artery (SCA) is defined as middle segment, and the segment between the SCA and the posterior cerebral artery (PCA) is defined as distal segment. Though the exact incidence of basilar artery occlusion (BAO) is unknown, it is estimated to account for 1% of all ischemic strokes.[1] BAO results in infarction in the cerebellum, thalamus, brain stem and occipital region. Although the clinical presentation varies widely, sudden deterioration in consciousness, coma, hemiparesis/hemiplegia, dysphagia, aphasia, cranial nerve involvement, dizziness, nausea, vomiting and seizures may be observed. Death or disability results in 70-80% of patients with BAO.[2,3] Treatment protocols for BAO with such high morbidity and mortality are still controversial. While Endovascular Therapy (EVT) is the gold standard in the anterior system, EVT is still controversial in the posterior system. In the BEST (Basilar Artery Occlusion Endovascular Intervention versus Standard Medical Treatment) and BASICS (Basilar Artery International Cooperation Study) studies, EVT was not found to be superior to standard medical treatment. However, the ATTENTION (Endovascular Treatment For Acute Basilar Artery Occlusion: A Multicentre Randomized Clinical Trial) and BAOCHE (Basilar Artery Occlusion Chinese Endovascular) studies showed that EVT achieved a better 90-day modified Rankin score (mRS 0-3) and a lower mortality rate.[4] Although successful EVT can be performed in BAO, it is well known that multiple factors influence prognosis. In this study, we retrospectively analyzed the data of patients who underwent EVT for isolated BAO and compiled factors that might impact prognosis.

MATERIAL AND METHODS

The study included patients who underwent EVT for BAO between 01.01.2019-01.04.2024 at the Dicle University Stroke Center. Our study received approval from the Dicle University Non-Interventional Clinical Research Ethics Committee (Date: October 16, 2024; Decision No: 70). This study was conducted in accordance with the Declaration of Helsinki. The study consisted of the patients who underwent EVT and then followed up in our clinic. Patients diagnosed with BAO who underwent EVT and followed up for 3 months were included in a cross-sectional study without a control group.

In the study, patients older than 18 years with available data in the hospital registry system were included. Evaluated variables comprised the National Institutes of Health Stroke Scale (NIHSS) scores immediately before the procedure and at 24 hours, modified Rankin Scale (mRS) at 3 months, Glasgow Coma Scale (GCS) on hospital arrival, location of the basilar artery occlusion, Thrombolysis in Cerebral Infarction (TICI) recanalization score, number of passes performed for vessel recanalization, and time to procedure (defined as the interval from symptom onset to groin puncture). Additionally, preoperative lymphocyte and neutrophil counts, hematocrit values, as well as patients' pre-stroke comorbidities—including hypertension, diabetes mellitus, atrial fibrillation, and coronary artery disease—were recorded and analyzed. In addition, the preoperative neutrophil-to-lymphocyte ratios (NLR) of the patients were evaluated and calculated. Patients with thrombi in arteries other than the BA, those with sequelae from a prior stroke or other causes, and those who received thrombolytic therapy were excluded from the study. Only patients who underwent isolated EVT were included.

MAIN POINTS

- In patients with basilar artery occlusions who underwent EVT, a decrease in the PASS score is associated with an increase in functional independence
- In patients with basilar artery occlusions who underwent EVT, preoperative NLR is associated with mortality
- In patients who underwent thrombectomy for basilar artery occlusion, a significant relationship was found between admission NIHSS, 24-hour NIHSS, and functional dependency

The statistical analysis of the study data was performed using IBM SPSS Statistics 27.0 for Windows. Continuous variables were expressed as mean ± standard deviation (SD), while categorical variables were presented as counts and percentages (%). The normality of the data distribution was assessed using skewness and kurtosis tests. To evaluate relationships between variables, Pearson correlation analysis was applied for normally distributed variables, whereas Spearman's rho correlation was used for variables not meeting the normality assumption. Receiver Operating Characteristic (ROC) curve analysis was conducted to determine cut-off values for neutrophil, lymphocyte, and neutrophil-to-lymphocyte ratio (NLR) levels, with optimal cut-off points identified using the Youden index. A multivariable logistic regression analysis was performed to investigate factors associated with mortality, including age, sex, chronic comorbidities (diabetes mellitus, hypertension, coronary artery disease, and atrial fibrillation), TICI success, time to procedure, NLR, and occlusion segment. The occlusion segment was included as a categorical variable using dummy coding, while age, time from symptom onset, and puncture time were treated as continuous variables. Prior to the multivariable analysis, multicollinearity among neutrophil, lymphocyte, and NLR variables was assessed. Given that variance inflation factor (VIF) values exceeded 5 for neutrophil and lymphocyte variables, these were excluded from the multivariable model, and NLR was retained. All hypotheses were tested two-tailed, and P-values ≤ .05 were considered statistically significant.

RESULTS

43 patients who were followed up in a stroke center were included in our study.[5] patients were excluded because they did not meet the inclusion criteria. Of these five patients, one was 9 years old, one had sequelae due to a malignancy diagnosis, one was not functionally independent due to a previous stroke, and two had received intravenous thrombolytic therapy. Among the patients included in our study, 55.3% (21/38) were male. The mean age of the patients was 57.00±18.15 years. According to the NIHSS, 57.9% of the patients presented with severe stroke. Successful reperfusion of BA was achieved in 89.5% of patients after the procedure. Intracerebral hemorrhage (ICH) was observed as a complication in 2 (5.2%) patients who underwent EVT. In our study, the mortality rate was 47.4% (18/38) according to the mRS score evaluated at 3 months. In addition, the proportion of patients who were functionally independent according to the 3rd month mRS score (0-3) was 44.7% (17/38). The descriptive data of the patients and the data related to the thrombectomy procedure before, during and after the procedure are shown in Table 1.

Table 1: Descriptive Data of the Patients

Gender	Male			21-55.3%
	Female			17-44.7%
Age		19-84	57.00±18.16	
Occlusion sites	Proximal			13-34.2%
	Distal			18-47.4%
	Middle			7-18.4%
Admission NIHSS	Minor stroke (1-4)			0-0%
	Moderate stroke (5-15)			6-15.8%
	Moderate-severe stroke (16-20)			10-26.3%
	Severe stroke (21-42)			22-57.9%
24-hour NIHSS	Minor stroke (1-4)			6-15.8%
	Moderate stroke (5-15)			13-34.2%
	Moderate-severe stroke (16-20)			1-2.6%
	Severe stroke (21-42)			18-47.4%
TICI	Unsuccessful reperfusion (0-2a)			4-10.5%
	Successful reperfusion (2b-3)			34-89.5%
Technique of thrombectomy	Aspiration			1-2.6%
	Stent-retriever			7-18.4%
	Aspiration + Stent-retriever			30-78.9%
Admission GCS		3-15	9.82±4.24	
Time to procedure (hours)		1-30	6.76±5.27	
PASS		1-12	2.68±2.04	
Complication				2-5.2%
3-month mRS	Independent patients (0-3)			17-44.7%
	Dependent patients (4-6)			21-55.3%
Hematocrit		29-72	39.29±7.82	
Lymphocyte		0.41-9.34	1.42±1.41	
Clinical Characteristics				
Hypertension	No			14-36.8%
	Yes			24-63.2%
Diabetes	No			16-42.1%
	Yes			22-57.9%
Coronary Artery Disease	No			28-73.7%
	Yes			10-26.3%
Atrial Fibrillation	No			27-71.1%
	Yes			11-28.9%

NIHSS, National Institutes of Health Stroke Scale; GCS, Glascow Coma Scale; TICI, Thrombolysis in Cerebral Infarction; mRS, modified Rankin scale.

mRS scores evaluated at 3 months were divided into two groups as functionally independent patients (0-3) and functionally dependent patients (4-6) to improve the accuracy of the analysis. There was no statistically significant difference between the gender of the patients, the site of BA occlusion, the type of procedure performed in TICI and thrombectomy and their mRS status evaluated at 3 months after the procedure (P=.360, P=.570, P=1.000, P=.823, respectively) (Table 2).

Table 2: Comparison of patients' 3-month mRS assessment with gender and thrombectomy-related data

		3-month mRS				P
		Functionally independent patients		Functionally dependent patients		
		n	%	n	%	
Gender	Male (n:21)	8	38.1	13	61.9	.360
	Female (n:17)	9	52.9	8	47.1	
Occlusion sites	Proximal (n:13)	7	53.8	6	46.2	.570
	Distal (n:18)	8	44.4	10	55.6	
	Middle (n:7)	2	28.6	5	71.4	
TICI	Unsuccessful reperfusion (n:4)	2	50.0	2	50.0	1.000
	Successful reperfusion (n:34)	15	44.1	19	55.9	
Technique of thrombectomy	Aspiration (n:1)	1	100.0	0	0.0	.823
	Stent-retriever (n:7)	3	42.9	4	57.1	
	Aspiration + Stent-retriever (n:30)	13	43.3	17	56.7	

TICI, Thrombolysis in Cerebral Infarction.

There was no statistically significant difference between the age and GCS score of the patients and their mRS status which evaluated at 3 months after the procedure (P=1.000, P=.487, respectively). The number of PASSs performed during the procedure in functionally dependent patients was significantly higher than in independent patients (P=.048). The NIHSS scores of the functionally dependent patients on admission and at 24 hours were significantly higher than those of the independently evaluated patients (P=.005, P<.001, respectively). The comparison of the MRS evaluation of the patients at 3 months with the data related to age, number of PASSs and patient status is shown in Table 3.

Table 3: Comparison of the patients' mRS evaluation at 3 months with data on age, PASS number, and patient condition

		median.±SD.	Median	Minimum	Maximum	P
Age	Independent patients	55.06±23.58	60.00	9.00	84.00	1.000
	Dependent patients	58.57±12.62	61.00	36.00	75.00	
PASS	Independent patients	1.94±0.90	2.00	1.00	3.00	.048
	Dependent patients	3.29±2.49	3.00	1.00	12.00	
Admission NIHSS	Independent patients	18.71±6.55	20.00	8.00	30.00	.005
	Dependent patients	25.48±6.69	25.00	16.00	40.00	
24-hour NIHSS	Independent patients	6.12±2.85	6.00	2.00	10.00	<.001
	Dependent patients	31.19±8.61	34.00	8.00	40.00	
GCS	Independent patients	13.24±2.56	14.00	6.00	15.00	.487
	Dependent patients	7.05±3.15	6.00	3.00	13.00	

NIHSS, National Institutes of Health Stroke Scale; GCS, Glascow Coma Scale.

The discriminatory performance of neutrophil levels for predicting mortality in patients with BAO treated with EVT was assessed by ROC curve analysis. The area under the curve (AUC) was 0.880 (Figure 1), indicating strong discriminative ability. The optimal cut off value was determined to be 10.010, at which the Youden index was 0.467, sensitivity was 66.7%, and specificity was 80.0%. However, due to significant multicollinearity between neutrophil count and neutrophil to lymphocyte ratio (NLR) (variance inflation factor [VIF] = 6.78), neutrophil count was excluded from the multivariable model.

For NLR, ROC analysis yielded an AUC of 0.898, with an optimal cut off of 5.06, corresponding to a Youden index of 0.644, sensitivity of 94.4%, and specificity of 70.0% (Figure 1).

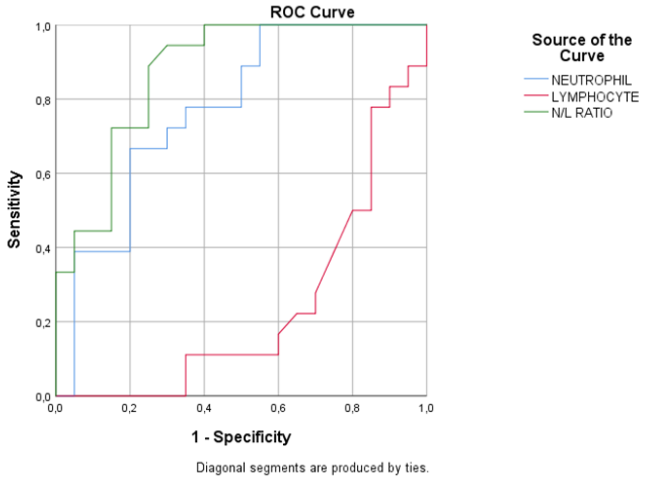

Figure 1. ROC Analysis Between Neutrophil Lymphocyte and Neutrophil-to-Lymphocyte Ratio and Mortality.

In the adjusted multivariable logistic regression model, NLR emerged as an independent predictor of mortality (P=.029). Each one unit increase in NLR was associated with a 1.91 fold increase in the odds of mortality (OR: 1.914; 95% CI: 1.067–3.434) (Table 4).

Table 4: Multivariate Logistic Regression Analysis of Factors Associated with Mortality

	B	P	OR	95% CI (lower-upper)
NLR	0.649	.029*	1.914	1.067 – 3.434
Age	0.102	.133	1.108	0.969 – 1.266
Diabetes (No=0, Yes=1)	0.846	.058	2.313	0.886 – 3.411
Hypertension (No=0, Yes=1)	-2.220	.186	0.109	0.004 – 2.905
Atrial Fibrillation (No=0, Yes=1)	0.847	.540	2.333	0.155 – 3.163
Coronary Artery Disease (No=0, Yes=1)	0.130	.931	1.139	0.060 – 2.705
Gender (Female=1, Male=2)	1.215	.567	1.370	0.954 – 2.075
TICI (1=Successful recanalization)	0.846	.625	1.330	0.782 – 1.819
Procedure Time (hours)	0.014	.916	1.014	0.781 – 1.316
Distal Occlusion (Dummy Variable)	-0.846	.658	0.429	0.328 – 1.202
Middle Occlusion (Dummy Variable)	0.319	.898	1.376	0.452 – 1.444

TICI, Thrombolysis in Cerebral Infarction; CI, confidence interval; NLR, neutrophil-to-Lymphocyte ratio; OR, Odss Ratio. P value,multivariable logistic regression analysis.

Other notable observations included: Diabetes mellitus, which was associated with a 2.31 fold higher odds of mortality, although this did not reach conventional significance (P=.058; OR: 2.313; 95% CI: 0.886–3.411). Hypertension, unexpectedly, was associated with reduced mortality odds (OR: 0.109; 95% CI: 0.004–2.905), but this finding was not statistically significant (P = .186) and warrants cautious interpretation given the wide confidence interval. Atrial fibrillation, coronary artery disease, sex, TICI score, procedure time, and occlusion location (distal/middle vs. proximal) were not independently associated with mortality (P range:.133–.931).

DISCUSSION

In our single-center retrospective study of 38 patients, 44.7% of patients had functional independence, 89.5% had successful recanalization and 5.2% had procedural complications. These rates are more successful than many previously published studies in which EVT with BAO was performed.[5,6]

In our study, the rate of patients with successful recanalization but no recovery was 55.9%. This suggests that the reasons for successful reperfusion/recanalization with poor outcome should be investigated. Functional independence was observed in 2 of our patients despite failed recanalization. This shows that vessel recanalization alone is not sufficient for functional independence.[7] The recanalization and infarction grading score TICI is used in ischemic stroke. The modified 5-point TICI score was originally developed for the anterior system. It was then started to be used in posterior system strokes. The modified TICI score is very successful in showing prognosis and recanalization in anterior system strokes. In the posterior system, some studies have shown inconsistency between interpreters.[8] This may be another reason for the statistical discordance between TICI and functional independence, which was also observed in our study.

The absence of any relation between the shortness of the time difference between the symptom onset time and the time taken for processing and mRS in our study is different from the ENDSTROKE study and overlaps with some studies.[5,9] This may be attributed to the fact that some patients with BAO have a prodromal phase before the onset of the main symptoms. Because of this prodromal symptom period, the "last normal hour" standard in the anterior system is not fulfilled in BAO. In addition, the perfection of the collaterals of the posterior system may also be a reason for this situation.[10]

In our study, aspiration, stentriever and aspiration+stentriever methods were used for EVT in patients with BAO. In the majority of patients, aspiration+stentriver was used in 78.9% and no correlation was found between the 3rd month mRS and these methods. This is similar to the US-based BAO study of 383 patients. In this study, patients using aspiration and stentriever were compared and no significant difference was found between the two procedures in terms of functional independence.[11] In another study involving 387 patients, no difference was observed between aspiration and stentriever in terms of good outcome in patients undergoing EVT with BAO.[12]

In our study, the number of passes of patients who underwent EVT was statistically significant and directly related to functional status. As the number of passes of patients who underwent EVT in BAO increases, functional independence status ends poorly. Our mean pass rate was 2.68, 1.94 in the functionally independent group and 3.29 in the functionally dependent group according to mRS. In studies, there is a statistically significant difference in terms of good outcome between those with a pass number ≤3 and those with a pass number >3.[13] In addition,

our successful recanalization rate with first pass is 31%. Some studies have shown that the first pass effect is the most important factor associated with good clinical outcome.[14]

There are studies showing that the NIHSS scores of patients with BAO may be higher when compared with the anterior system.[15] Therefore, the NIHSS in our study had a higher NIHSS score when compared to anterior system occlusions. Some studies have shown that the patient's NIHSS scores at admission and 24th hour are an independent parameter to indicate functional status.[16,17] In our study, the mean NIHSS score was 22.45 on admission and 19.97 at 24 hours. There is a significant statistical result when the NIHSS score is compared with the dependent and independent functional group. When the NIHSS score increases, the dependent functional outcome increases. This situation confirms the studies.

As mentioned above, patients with BAO have higher NIHSS scores than patients with anterior system occlusions. This may lead to lower GCS scores in patients with BAO. Many studies have shown that GCS is a prognostic parameter for functional dependence in posterior system occlusions.[18,19] In a retrospective review of patients with BAO in a Finnish study, approximately 39.8% of 312 patients presented with coma, in another word GCS≤8, and were included in the EVT procedure. Functional independence was observed in 20% of these patients at 3 months.[20] In our study, 39.5% (15/38) patients presented with coma, which is close to the literature rates. Of these patients, 13.3% (2/15) ended up as functionally independent at 3 months. It shows that EVT may benefit the patient even if the patient has a poor clinical condition or low GCS at presentation. In addition, although the mean GCS of the functionally independent group was higher than the mean GCS of the functionally dependent group in our study, no statistically significant difference was found.

Inflammation plays a critical role in the pathophysiology of ischemic stroke, and neutrophils are among the early responders in this process. In the acute phase, the inflammatory response is activated following reperfusion, and neutrophils contribute to endothelial and tissue damage through blood-brain barrier disruption. In our study, the strong association between neutrophil count and mortality is consistent with these mechanisms. Neutrophils can accelerate cerebral edema and brain blood barier disruption by increasing the release of reactive oxygen species and pro-inflammatory cytokines (IL-1β, TNF-α, IL-6).[21,22]

Additionally, NLR has been identified as a biomarker reflecting systemic inflammation and has been associated with stroke prognosis. In our study, NLR demonstrated high sensitivity (94.4%) in ROC analysis and was found to have an independent and statistically significant association with mortality in multivariable logistic regression analysis (P=.029; OR: 1.914; 95% CI: 1.067–3.434). Moreover, considering other clinical variables, NLR is suggested to be a strong biomarker for predicting mortality on its own.

In light of these findings, integrating NLR into clinical decision-support systems in acute ischemic stroke could be beneficial for prognosis prediction.[23] Moreover, controlling neutrophil-mediated inflammation following EVT may be considered as part of neuroprotective strategies. Since this topic has not been previously studied in BAO patients, larger-scale studies are needed to provide more definitive conclusions regarding the clinical utility of neutrophil count and particularly NLR.

CONCLUSION

The most important limitation of our study is the small number of patients. Despite this fact, it is very important that most of the data are consistent with the literature. In this retrospective study, we argue that EVT should be performed in patients with BAO. EVT should be considered as an option even if the presentation time is late, the GCS is low or the NIHSS score is high. It should be kept in mind that patients recanalized with a first pass will have a better functional outcome.

Ethics Committee Approval: The study was approved by the Non-Interventional Clinical Research Ethics Committee of Dicle University (Date: October 16, 2024; Decision No: 70). The study was conducted in accordance with the principles of the Declaration of Helsinki.

Informed Consent: Written informed consent was not obtained from the patients due to the retrospective nature of the study.

Peer-review: Externally peer-reviewed.

Authorship Contributions: Concept – E.A.; Design – C.Ç.; Supervision – E.A.; Resources – M.Ö., E.A.; Materials – E.A., H.G., C.Ç.; Data Collection and/or Processing – M.Ö., H.G.; Analysis and/or Interpretation – M.Ö.; Literature Search – E.A., H.G., C.Ç.; Writing Manuscript – M.Ö., H.G.; Critical Review – E.A.; Other – M.Ö., C.Ç., H.G., E.A.

Declaration of Interest: The authors have no conflicts of interest to declare.

Funding: The authors declared that this study has received no financial support.

Acknowledgement: The study was presented as an oral presentation at the 8th International Turkey Stroke Academy and Practical Courses.

REFERENCES

1. Israeli-Korn SD, Schwammenthal Y, Yonash-Kimchi T, et al. Ischemic stroke due to acute basilar artery occlusion: proportion and outcomes. *Isr Med Assoc J.* 2010;12(11):671.
2. Mattle HP, Arnold M, Lindsberg PJ, et al. Basilar artery occlusion. *Lancet Neurol.* 2011;10:1002–1014. [CrossRef]
3. Schonewille WJ, Wijman CA, Michel P, et al. Treatment and outcomes of acute basilar artery occlusion in the Basilar Artery International Cooperation Study (BASICS): a prospective registry study. *Lancet Neurol.* 2009;8(8):724-730. [CrossRef]
4. Xu J, Chen X, Chen S, et al. Endovascular treatment for basilar artery occlusion: a meta-analysis. *Stroke Vasc Neurol.* 2023;8(1):1-3. [CrossRef]
5. Pasarikovski CR, Khosravani H, da Costa L, et al. Outcomes of endovascular thrombectomy for basilar artery occlusion. *Can J Neurol Sci.* 2020;47(4):479-485. [CrossRef]
6. Abdelrady M, Ognard J, Cagnazzo F, et al. Frontline thrombectomy strategy and outcome in acute basilar artery occlusion. *J Neurointerv Surg.* 2023;15(1):27-33. [CrossRef]
7. Lindsberg PJ, Strbian D. Recanalization of basilar artery occlusion. *Ann Neurol.* 2015;78(5):832-833. [CrossRef]
8. Findler M, Turjman AS, Raymond J, et al. Interobserver agreement in scoring angiographic results of basilar artery occlusion stroke therapy. *AJNR Am J Neuroradiol.* 2021;42(8):1458-1463. [CrossRef]
9. Singer OC, Berkefeld J, Nolte CH, et al. Mechanical recanalization in basilar artery occlusion: the ENDOSTROKE study. *Ann Neurol.* 2015;77(3):415-424. [CrossRef]
10. Lindsberg PJ, Pekkola J, Strbian D, et al. Time window for recanalization in basilar artery occlusion: speculative synthesis. *Neurology.* 2015;85(20):1806-1815. [CrossRef]
11. Mierzwa AT, Al Kasab S, Nelson A, et al. Comparing functional outcomes and safety profiles of first-line aspiration thrombectomy versus stentriever for acute basilar artery occlusion: propensity analysis of the PC-SEARCH Thrombectomy Registry. *Stroke.* 2023;54(10):2512-2521. [CrossRef]

12. Wischmann J, Zimmermann H, Keidel L, et al. Aspiration only versus stent retriever only thrombectomy in basilar artery occlusion: a propensity score-matched analysis of the German Stroke Registry. *J Neurointerv Surg.* 2025;17(e2):e393-e399. [CrossRef]
13. de Havenon A, Elhorany M, Boulouis G, et al. Thrombectomy in basilar artery occlusions: impact of number of passes and futile reperfusion. *J Neurointerv Surg.* 2023;15(5):422-427. [CrossRef]
14. Pop R, Finitsis SN, Arquizan C, et al. Poor clinical outcome despite successful basilar occlusion recanalization in the early time window: incidence and predictors. *J Neurointerv Surg.* 2023;15(5):415-421. [CrossRef]
15. Ekkert A, Jokimaitytė U, Tutukova V, et al. Endovascular treatment of basilar artery occlusion: what can we learn from the results? *Medicina.* 2022;59(1):96. [CrossRef]
16. Ravindren J, Aguilar Pérez M, Hellstern V, et al. Predictors of outcome after endovascular thrombectomy in acute basilar artery occlusion and the 6hr time window to recanalization. *Front Neurol.* 2019;10:923. [CrossRef]
17. Rangaraju S, Jovin TG, Frankel M, et al. Neurologic examination at 24 to 48 hours predicts functional outcomes in basilar artery occlusion stroke. *Stroke.* 2016;47(10):2534-2540. [CrossRef]
18. Cao J, Mo Y, Chen R, et al. Predictors of functional outcome and mortality in endovascular treatment for acute basilar artery occlusion: a single-centre experience. *Front Neurol.* 2021;12:731300. [CrossRef]
19. Fan Y, Li Y, Zhang T, et al. Endovascular therapy for acute vertebrobasilar occlusion underlying atherosclerosis: A single institution experience. *Clin Neurol Neurosurg.* 2019;176:78-82. [CrossRef]
20. Ritvonen J, Sairanen T, Silvennoinen H, et al. Comatose with basilar artery occlusion: still odds of favorable outcome with recanalization therapy. *Front Neurol.* 2021;12:665317. [CrossRef]
21. Chamorro Á, Dirnagl U, Urra X, Planas AM. Neuroprotection in acute stroke: targeting excitotoxicity, oxidative and nitrosative stress, and inflammation. *Lancet Neurol.* 2016;15(8):869-881. [CrossRef]
22. Jickling GC, Liu D, Ander BP, et al. Targeting neutrophils in ischemic stroke: translational insights from experimental studies. *J Cereb Blood Flow Metab.* 2015;35(6):888-901. [CrossRef]
23. Smith CJ, Emsley HC, Udeh CT, et al. Interleukin-1 receptor antagonist reverses stroke-associated peripheral immune suppression. *Cytokine.* 2012;58(3):384-389. [CrossRef]