

Safety and effectiveness of nonoperative management in liver lacerations: a retrospective cohort study

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ABSTRACT

BACKGROUND: Liver trauma remains a major contributor to morbidity in patients with abdominal injuries. Although nonoperative management (NOM) is widely accepted in hemodynamically stable patients, the relationship between American Association for the Surgery of Trauma (AAST) injury grade, laboratory parameters, transfusion requirements, and the need for surgical intervention remains unclear.

METHODS: This retrospective observational study included 53 patients with radiologically or intraoperatively confirmed liver lacerations treated at a tertiary surgical center between October 2024 and May 2025. Data collected included demographics, vital signs, AAST injury grade, laboratory values, transfusion requirements, imaging use, and clinical outcomes. Statistical analyses were performed using analysis of variance (ANOVA), chi-square/Fisher's exact tests, and logistic regression.

RESULTS: The mean age was 41.4 years, with 67.9% of patients being male. The most common mechanism of injury was motor vehicle accidents (56.6%). On admission, 64.2% of patients had AAST grade I-II injuries, while 7.5% had grade IV injuries. NOM was successful in 81.1% of cases, with 18.9% requiring operative intervention. No in-hospital mortality was observed. Changes in hemoglobin and hematocrit levels were not significantly associated with injury grade or the need for surgery. However, transfusion requirements increased with injury severity, including erythrocyte suspension ($p=0.006$) and fresh frozen plasma ($p<0.001$). Follow-up imaging ($n=25$) demonstrated stable or improved findings in 96% of patients. Logistic regression analysis did not identify independent predictors of surgical intervention.

CONCLUSION: NOM of liver lacerations is safe and effective, with excellent outcomes and no mortality observed in this cohort. Although AAST injury grade alone did not predict the need for surgery, transfusion requirements correlated with injury severity, highlighting their value as practical indicators in clinical decision-making.

Keywords: American Association for the Surgery of Trauma (AAST) grade; Liver trauma; nonoperative management; transfusion.

INTRODUCTION

Traumatic liver injury remains a significant contributor to morbidity and mortality in patients with abdominal trauma and continues to present a common challenge in emergency surgical practice. Historically, operative management was considered the standard approach; however, over the past two

decades, nonoperative management (NOM) has emerged as the preferred strategy for hemodynamically stable patients, including those with high-grade injuries. This shift has been driven by advances in imaging, critical care, and interventional radiology.^[1]

Success rates for NOM in blunt hepatic trauma now exceed

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90% in many large series, with corresponding reductions in morbidity and mortality as patient selection and institutional protocols have evolved.^[2] However, NOM failure, requiring delayed surgical or interventional procedures, remains clinically important, and predictors of such outcomes are not yet well established.

The American Association for the Surgery of Trauma (AAST) liver injury scale is widely used for grading injury severity and guiding management decisions. However, previous studies have reported inconsistent associations between AAST grade and clinical outcomes, including transfusion requirements, radiologic progression, and the need for surgical intervention.^[3] Furthermore, only a limited number of studies have evaluated radiologic grading alongside serial imaging changes and laboratory parameters, such as transfusion requirements, within an integrated framework.

In this context, we conducted a retrospective analysis of patients with liver lacerations treated at a tertiary surgical center. The aim of this study was to evaluate the relationship between AAST grade, laboratory parameters, transfusion requirements, imaging findings, and clinical outcomes. Specifically, we sought to identify potential predictors of NOM failure or the need for surgical intervention, thereby contributing to more nuanced management strategies, particularly in settings with variable access to advanced imaging or interventional radiology.

MATERIALS AND METHODS

Study Design and Setting

This study was designed as a retrospective observational cohort study and conducted at a tertiary care surgical center. All patients diagnosed with liver lacerations and managed between October 2024 and May 2025 were evaluated. This study was approved by the Local Ethics Committee of Ankara Etilik City Hospital Ethics Committee (Date: 02/09/2025, Decision No: AEŞH-BADEK2-2025-365) and was carried out in accordance with the principles of the Declaration of Helsinki.

Study Population

A total of 53 consecutive patients with radiologically or intraoperatively confirmed liver lacerations were included. Patients with incomplete medical records, missing laboratory or imaging data, or concomitant injuries that precluded reliable assessment of liver trauma severity were excluded.

Data Collection

Data were obtained from electronic medical records and operative reports. Baseline demographic and clinical characteristics included age, sex, mechanism of injury, and vital signs on admission (systolic and diastolic blood pressure, heart rate), as well as findings from abdominal examination. All data were cross-verified using electronic medical records, operative notes, and radiology reports to ensure completeness and accuracy.

Injury severity was assessed using the AAST liver injury scale at presentation and, when available, reassessed on follow-up imaging. Laboratory parameters included hemoglobin, hematocrit, and prothrombin time/international normalized ratio (PT/INR), measured at both admission and discharge. The decline in hemoglobin and hematocrit during hospitalization was calculated as the difference between admission and discharge values. Blood product utilization was recorded as the total number of erythrocyte suspension and fresh frozen plasma (FFP) units administered.

Imaging utilization was evaluated based on the number and modality of studies performed, including ultrasonography, computed tomography, or both. Progression in AAST grade was assessed in patients who underwent at least one follow-up imaging study.

Clinical outcomes included length of hospital stay, occurrence of complications, requirement for surgical intervention, and in-hospital mortality.

Statistical Analysis

Continuous variables are presented as mean \pm standard deviation (SD) with ranges, while categorical variables are expressed as counts and percentages. Comparisons across AAST grades were performed using one-way analysis of variance (ANOVA) or the Kruskal–Wallis test for continuous variables, and the chi-square test or Fisher's exact test for categorical variables, as appropriate. Logistic regression analysis was used to identify factors associated with the need for surgical intervention, with results reported as odds ratios (ORs) and 95% confidence intervals (CIs). A p-value <0.05 was considered statistically significant.

All statistical analyses were conducted using IBM SPSS Statistics, version 27 (IBM Corp., Armonk, NY, USA).

RESULTS

A total of 53 patients with liver lacerations were included in the study. The mean age was 41.4 ± 16.5 years (range: 20–92 years). Most patients were male (67.9%), while females accounted for 32.1% of the cohort (Fig. 1). Demographic characteristics are summarized in Table 1.

Motor vehicle accidents were the most common mechanism of injury, accounting for 56.6% of cases. Among these, in-vehicle accidents were more frequent (37.7%) than incidents involving pedestrians or individuals outside the vehicle (18.9%). Falls and stab wounds each accounted for 17.0% of cases, while firearm injuries (5.7%) and physical assaults (3.8%) were less common (Table 1).

On initial assessment, the mean systolic blood pressure was 111.3 ± 9.7 mmHg and the mean diastolic blood pressure was 72.5 ± 6.3 mmHg, indicating relative hemodynamic stability in most patients. The mean heart rate was 86.9 ± 7.8 beats per minute. Abdominal tenderness was present in 30 patients

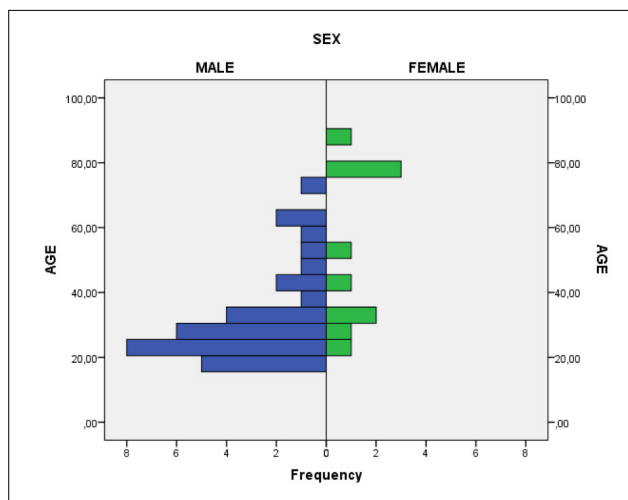


Figure 1. Population pyramid of the study cohort.

(56.6%), while 23 patients (43.4%) had no tenderness on examination.

Injury severity at presentation was distributed across the AAST grades I–IV. The most common grades were II (34.0%) and I (30.2%), followed by grade III (28.3%) and grade IV (7.5%). Injury grading at admission and follow-up according to the AAST classification is summarized in Table 2.

Among the 25 patients who underwent follow-up imaging, most demonstrated improvement. Eighteen patients (72.0%)

Table 2. Injury severity and laboratory findings of patients with liver lacerations (n=53)

Variable	Overall (n=53)
AAST grade at presentation, n (%)	
I	16 (30.2%)
II	18 (34.0%)
III	15 (28.3%)
IV	4 (7.5%)
AAST grade at follow-up (n=25)	
I	18 (72.0%)
III	6 (24.0%)
IV	1 (4.0%)
Initial hemoglobin (g/dL)	13.9±2.3 (8–18)
Discharge hemoglobin (g/dL)	12.1±2.5 (8–17)
Decrease in hemoglobin (g/dL)	1.8±1.5 (–3 to 6)
Initial hematocrit (%)	41.9±6.6 (24–53)
Discharge hematocrit (%)	36.2±7.9 (10–50)
Decrease in hematocrit (%)	5.7±6.6 (–6 to 36)
PT/INR (sec)	10.3±3.1 (8–30)
Erythrocyte suspension transfusion, mean units (range)	0.41±0.88 (0-4)
FFP transfusion, mean units (range)	0.29±0.97 (0-6)

Values are presented as mean ± standard deviation (range) or number (percentage), as appropriate. AAST: American Association for the Surgery of Trauma; n: Number of patients; g/dL: Grams per deciliter; PT/INR: Prothrombin Time / International Normalized Ratio; FFP: Fresh Frozen Plasma; sec: Seconds.

Table 1. Baseline demographic and clinical characteristics of patients with liver lacerations (n=53)

Variable	Overall (n=53)
Age, years	41.4±16.5 (20–92)
Sex, n (%)	
Male	36 (67.9%)
Female	17 (32.1%)
Mechanism of injury, n (%)	
Motor vehicle accident (occupant)	20 (37.7%)
Motor vehicle accident (pedestrian)	10 (18.9%)
Fall	9 (17.0%)
Stab wound	9 (17.0%)
Firearm injury	3 (5.7%)
Assault	2 (3.8%)
Systolic BP (mmHg)	111.3±9.7 (90–140)
Diastolic BP (mmHg)	72.5±6.3 (50–85)
Heart rate (bpm)	86.9±7.8 (70–105)
Abdominal tenderness, n (%)	
Yes	30 (56.6%)
No	23 (43.4%)

Values are presented as mean ± standard deviation (range) or number (percentage), as appropriate.

were classified as grade I, six patients (24.0%) remained grade III, and one patient (4.0%) was classified as grade IV. Overall, 96.0% of patients showed stable or improved AAST grades, while only one patient (4.0%) experienced progression of injury severity on follow-up imaging (Table 2).

Laboratory analysis at admission showed a mean hemoglobin level of 13.9±2.3 g/dL (range: 8–18), which decreased to 12.1±2.5 g/dL (range: 8–17) at discharge. The mean decline in hemoglobin during hospitalization was 1.8±1.5 g/dL, ranging from a decrease of 3 g/dL to an increase of 6 g/dL. Similarly, hematocrit decreased from a mean of 41.9±6.6% at admission to 36.2±7.9% at discharge, with a mean reduction of 5.7±6.6% (range: –6 to 36).

Coagulation parameters were generally within normal limits, with a mean prothrombin time (PT/INR) of 10.3±3.1 seconds (range: 8–30). The mean erythrocyte suspension requirement was 0.41±0.88 units (maximum: 4 units), while fresh frozen plasma (FFP) use averaged 0.29±0.97 units (maximum: 6 units).

Patients underwent a mean of 1.86±1.34 imaging studies during hospitalization (range: 0–5). Ultrasonography was the most frequently used modality, performed in 40 patients

Table 3. Imaging utilization and American Association for the Surgery of Trauma (AAST) grade progression

Variable	Overall (n=53)
Number of imaging studies, mean±SD (range)	1.86±1.34 (0-5)
Imaging modality, n (%)	
Ultrasonography	40 (75.5%)
CT	2 (3.8%)
Both US and CT	11 (20.8%)
AAST grade at presentation, n (%)	
I	16 (30.2%)
II	18 (34.0%)
III	15 (28.3%)
IV	4 (7.5%)
AAST grade at follow-up (n=25)	
I	18 (72.0%)
III	6 (24.0%)
IV	1 (4.0%)
AAST progression, n (%)	
Stable or improved	24 (96.0%)
Worsened	1 (4.0%)

Values are presented as mean ± standard deviation (range) or number (percentage), as appropriate. AAST: American Association for the Surgery of Trauma; CT: Computed Tomography; n: Number of patients; SD: Standard Deviation; US: Ultrasonography.

Table 4. Clinical outcomes

Variable	Overall (n=53)
Complications, n (%)	
Yes	1 (1.9%)
No	52 (98.1%)
Surgical intervention, n (%)	
Yes	10 (18.9%)
No	43 (81.1%)
Length of hospital stay, days	5.4±4.0 (1–23)
In-hospital mortality, n (%)	0 (0%)

Values are presented as mean ± standard deviation (range) or number (percentage), as appropriate.

(75.5%), whereas computed tomography (CT) alone was used in two patients (3.8%). A combination of ultrasonography and CT was utilized in 11 patients (20.8%). Imaging modalities used during hospitalization are summarized in Table 3.

Injury grading at presentation showed that 30.2% of patients were classified as AAST grade I, 34.0% as grade II, 28.3% as grade III, and 7.5% as grade IV. Follow-up imaging was avail-

Table 5. Association between American Association for the Surgery of Trauma (AAST) grade and surgical management

AAST Grade	No surgery, n (%)	Surgery, n (%)	Total, n (%)
I (n=16)	12 (75.0%)	4 (25.0%)	16 (30.2%)
II (n=18)	15 (83.3%)	3 (16.7%)	18 (34.0%)
III (n=15)	13 (86.7%)	2 (13.3%)	15 (28.3%)
IV (n=4)	3 (75.0%)	1 (25.0%)	4 (7.5%)
Total (n=53)	43 (81.1%)	10 (18.9%)	53 (100%)

Values are presented as number (percentage). AAST: American Association for the Surgery of Trauma.

able for 25 patients, of whom 18 (72.0%) were classified as grade I, six (24.0%) as grade III, and one (4.0%) as grade IV.

Assessment of injury progression demonstrated that 96.0% of patients had stable or improved AAST grades on follow-up imaging, whereas only one patient (4.0%) exhibited worsening of injury severity.

Clinical outcomes were favorable overall. Complications occurred in only one patient (1.9%), while 52 patients (98.1%) had an uncomplicated hospital course.

Surgical intervention was required in 10 patients (18.9%), whereas 43 patients (81.1%) were managed nonoperatively. The mean length of hospital stay was 5.4±4.0 days (range: 1–23 days) (Table 4).

No in-hospital mortality was observed in the study cohort.

Comparisons between operative and nonoperative management according to AAST injury grade are presented in Table 5. Overall, 43 patients (81.1%) were treated nonoperatively, while 10 patients (18.9%) required surgery. In grade I injuries, 12 of 16 patients (75.0%) were managed nonoperatively and four (25.0%) underwent surgery. In grade II injuries, 15 of 18 patients (83.3%) were treated without surgery, whereas three patients (16.7%) required operative management. Among patients with grade III injuries, 13 of 15 patients (86.7%) were managed nonoperatively and two (13.3%) underwent surgery. Of the four patients with grade IV injuries, three (75.0%) were treated nonoperatively and one (25.0%) required surgical intervention (Table 5).

In contrast, transfusion requirements were significantly associated with injury severity. Erythrocyte suspension use increased progressively with higher AAST grades, reaching the highest levels in grade IV injuries (p=0.006). Similarly, fresh frozen plasma requirements were lowest in grade I and increased across higher grades, with the greatest use observed in grade IV patients (p<0.001). Transfusion requirements according to AAST grade are summarized in Table 6.

Table 6. Clinical implications of American Association for the Surgery of Trauma (AAST) injury grade in liver lacerations

Outcome	AAST I (n=16)	AAST II (n=18)	AAST III (n=15)	AAST IV (n=4)	p-value
Decrease in hemoglobin (g/dL)	–	–	–	–	0.854
Decrease in hematocrit (%)	–	–	–	–	0.924
Erythrocyte suspension transfusion (units)	↑ lowest	↑ low	↑ low	↑↑ highest	0.006
FFP transfusion (units)	↑ lowest	↑ low	↑ moderate	↑↑ highest	<0.001
Number of imaging studies	–	–	–	–	0.312
Length of hospital stay (days)	–	–	–	–	0.416
Surgical intervention (%)	–	–	–	–	0.850

Comparisons were performed across AAST grades I–IV. Values are expressed as means or proportions, as appropriate. AAST: American Association for the Surgery of Trauma; FFP: Fresh Frozen Plasma; g/dL: Grams per deciliter; n: Number of patients.

Table 7. Factors associated with surgical management in liver lacerations (n=51)

Variable	B	SE	Wald	p-value	OR (Exp[B])	95% CI for OR
Age (years)	–0.047	0.039	1.44	0.229	0.95	0.88–1.03
Initial hemoglobin (g/dL)	0.470	1.040	0.20	0.651	1.60	0.21–12.30
Initial hematocrit (%)	–0.285	0.362	0.62	0.431	0.75	0.37–1.53
PT (sec)	0.029	0.201	0.02	0.886	1.03	0.69–1.53
ES suspension (units)	–1.081	0.869	1.55	0.213	0.34	0.06–1.86
FFP (units)	–0.697	1.158	0.36	0.547	0.50	0.05–4.82
Systolic BP (mmHg)	–0.024	0.061	0.16	0.690	0.98	0.87–1.10
Diastolic BP (mmHg)	–0.226	0.144	2.47	0.116	0.80	0.60–1.06
Heart rate (bpm)	0.143	0.089	2.58	0.108	1.15	0.97–1.37
Abdominal tenderness	–0.891	1.285	0.48	0.488	0.41	0.03–5.09
Constant	12.665	11.852	1.14	0.285	3.2×10 ⁵	–

Logistic regression analysis of factors associated with surgical management in patients with liver lacerations (n=51). OR: Odds ratio; CI: Confidence interval; SE: Standard error.

These findings indicate that, although most clinical parameters were not significantly influenced by AAST grade, transfusion requirements (both erythrocyte suspension and FFP) were significantly associated with increasing injury severity.

Logistic regression analysis was performed to identify factors associated with the need for surgical management in patients with liver lacerations (Table 7). None of the evaluated demographic, laboratory, or clinical variables emerged as statistically significant predictors of surgical intervention. Among the variables analyzed, transfusion requirement was the only parameter significantly correlated with higher AAST grades.

Specifically, age, initial hemoglobin, hematocrit, prothrombin time, erythrocyte suspension use, FFP use, systolic and diastolic blood pressure, heart rate, and the presence of abdominal tenderness all showed p-values >0.05. The corresponding

odds ratios demonstrated wide confidence intervals, indicating a lack of consistent associations (Table 7).

Overall, no independent predictor of surgical requirement was identified in the multivariable model.

DISCUSSION

In this retrospective cohort of 53 patients with radiologically or intraoperatively confirmed liver lacerations, clinical outcomes were favorable. The majority of patients (81.1%) were managed nonoperatively, while 18.9% required surgical intervention, and no in-hospital mortality was observed. These findings are consistent with the current management paradigm, which increasingly favors nonoperative strategies for both blunt and selected penetrating liver injuries. Recent multicenter studies and contemporary trauma guidelines re-

port NOM success rates exceeding 90% in stable patients, reinforcing its role as the standard of care in modern trauma practice.^[4-6]

Nonoperative Management and Clinical Outcomes

The NOM rate observed in our study (81.1%) is consistent with international evidence supporting NOM as the primary approach for blunt hepatic injuries in hemodynamically stable patients. The World Society of Emergency Surgery (WSES) 2020 guidelines report success rates above 90% in such cases.^[5] While the Eastern Association for the Surgery of Trauma (EAST) guidelines similarly recommend NOM as the standard of care, reserving operative intervention for patients with persistent instability or evidence of ongoing hemorrhage.^[6] The absence of in-hospital mortality in our cohort is notable and aligns with recent reports from tertiary care centers, where structured monitoring, serial imaging, and comprehensive supportive care in nonoperative liver injury management have been associated with improved survival outcomes.^[5]

AAST Grading and Surgical Requirement

We did not observe a statistically significant association between AAST grade and the need for surgical intervention, although patients with grade IV injuries demonstrated a trend toward higher transfusion requirements. This finding is consistent with previous evidence suggesting that anatomical injury grading alone may not reliably predict the need for operative management. While earlier studies reported correlations between higher AAST grades and increased rates of surgery or complications,^[7] more recent literature emphasizes the importance of physiological parameters—such as hemodynamic instability, transfusion burden, and contrast extravasation—as more robust predictors of clinical course.^[8,9] Our results support this perspective. Although changes in hemoglobin and hematocrit were not significantly associated with AAST grade, both erythrocyte suspension and FFP requirements increased significantly with injury severity, underscoring the clinical utility of transfusion patterns in injury stratification.

Laboratory Parameters and Transfusion

In our cohort, hemoglobin and hematocrit levels decreased modestly across all injury grades and were not associated with the need for surgical intervention. This finding contrasts with earlier literature, in which declining hemoglobin levels or ongoing transfusion requirements were considered early markers of nonoperative management failure.^[10,11] However, our findings support a growing body of evidence that dynamic parameters—particularly transfusion volume—may better reflect clinical severity than baseline laboratory values. Notably, both erythrocyte suspension and fresh frozen plasma requirements increased significantly with AAST grade ($p=0.006$ and $p<0.001$, respectively), consistent with studies identifying transfusion needs as key indicators of bleeding severity and risk of clinical deterioration.^[12] Recent series on solid organ trauma have similarly emphasized the prognostic value

of blood product utilization in guiding management strategies, particularly in resource-limited or nonoperative settings.^[13]

Imaging Utilization and AAST Progression

In our cohort, ultrasonography was the most frequently utilized imaging modality, while only 24% of patients underwent follow-up CT. This distribution likely reflects both institutional practice patterns and an emphasis on resource stewardship. Although contrast-enhanced CT is widely regarded as the preferred modality for evaluating hepatic injuries, particularly in higher AAST grades.^[14] Our findings suggest that careful clinical monitoring combined with selective imaging is sufficient in most cases. Notably, 96% of patients demonstrated stable or improved injury grade on follow-up, with only one case of radiological progression. These results support existing literature indicating that low- to moderate-grade liver injuries typically resolve without complication under NOM, and that routine serial imaging may be unnecessary in the absence of clinical signs of deterioration.^[15]

Predictors of Surgery

In our analysis, logistic regression did not identify any demographic, clinical, or laboratory variable as an independent predictor of surgical intervention. This likely reflects the complex and multifactorial nature of decision-making in liver trauma, where real-time dynamic clinical parameters often outweigh baseline measurements. In a prospective study of severe hepatic trauma, Leppaniemi et al.^[16] identified admission shock as the only independent predictor of early laparotomy, despite evaluating multiple anatomical and physiological variables. Similarly, Rouy et al.,^[8] in a multicenter study of 494 patients, demonstrated that high-grade injuries (AAST IV–V), hemoperitoneum, and contrast extravasation significantly increased the risk of NOM failure, particularly when present in combination. These findings are further reinforced by the WSES 2020 guidelines, which advocate for integrating imaging markers, such as contrast blush, hemodynamic instability, and the need for adjunctive interventions, into operative decision-making pathways, rather than relying solely on anatomical grade.^[9] Consistent with this contemporary evidence, our results suggest that surgical escalation is best guided by dynamic clinical judgment incorporating multiple parameters, rather than by isolated predictors.

In addition to the overall favorable outcomes observed in this cohort, a focused subgroup analysis of patients with high-grade liver injuries (AAST Grade III–IV) further supports the efficacy of nonoperative management. Despite the increased injury severity, 84.2% of these patients were successfully managed without surgery, and only three required operative intervention. Furthermore, no significant decrease in hemoglobin or hematocrit levels was observed in this group; however, transfusion requirements, particularly for erythrocyte suspension and fresh frozen plasma, were higher and reached statistical significance ($p=0.006$ and $p<0.001$, respectively). Importantly, among high-grade patients who underwent

follow-up imaging, only one case demonstrated radiological progression. These findings are consistent with recent studies suggesting that hemodynamically stable patients with high-grade liver injuries may benefit from conservative management, provided that close monitoring, early recognition of clinical deterioration, and adequate institutional resources are available.^[10] This study contributes to the existing literature by reporting transfusion-stratified NOM outcomes specifically in high-grade liver injury cases, supported by follow-up imaging in a substantial proportion of patients.

Study Limitations

This study contributes to the existing trauma literature by providing detailed insight into transfusion patterns, imaging follow-up, and clinical outcomes in a real-world tertiary care setting. The absence of in-hospital mortality and the exceptionally low complication rate underscore the safety and efficacy of a protocol-driven nonoperative approach to liver trauma. However, several limitations should be acknowledged. The retrospective, single-center design limits external validity, and the relatively small sample size may have reduced the statistical power to identify independent predictors of operative intervention. Although the sample size was relatively small (n=53), it reflects consecutive real-world experience at a tertiary trauma center and includes a substantial proportion of high-grade liver injuries, enabling meaningful subgroup analysis. Additionally, interventional radiology (IR) was not systematically utilized in our cohort, which may have influenced management decisions, particularly in patients with high-grade injuries or radiologic evidence of active bleeding. Despite these limitations, our findings provide valuable clinical context supporting selective imaging and transfusion-guided NOM strategies.

CONCLUSION

In this retrospective study of 53 patients with liver lacerations, nonoperative management was demonstrated to be safe and effective across all injury grades, including high-grade (AAST III–IV) injuries. The absence of in-hospital mortality, low complication rates, and high success rates of conservative treatment reinforce the role of protocol-based NOM in hemodynamically stable patients. These findings offer practical guidance, particularly for centers with limited access to interventional radiology, and underscore the importance of transfusion monitoring and the use of follow-up imaging in guiding management decisions.

Ethics Committee Approval: This study was approved by the Local Ethics Committee of Ankara Etlik City Hospital Ethics Committee (Date: 02.09.2025, Decision No: AEŞH-BADEK2-2025-365).

Peer-review: Externally peer-reviewed.

Informed Consent: The requirement for informed consent was waived by the ethics committee due to the retrospective

nature of the study and the use of anonymized clinical data.

Authorship Contributions: Concept: G.D.; Design: G.D.; Supervision: G.D.; Resource: M.H.Ç.; Materials: M.H.Ç.; Data collection and/or processing: M.H.K., M.Y.; Analysis and/or interpretation: G.D.; Literature review: D.K.; Writing: G.D., D.K.; Critical review: D.K.

Conflict of Interest: None declared.

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ORİJİNAL ÇALIŞMA - ÖZ

Karaciğer laserasyonlarında nonoperatif tedavinin güvenliği ve etkinliği: Retrospektif kohort çalışması

AMAÇ: Karaciğer travması, abdominal yaralanmalarda morbiditenin önde gelen nedenlerinden biri olmaya devam etmektedir. Hemodinamik olarak stabil hastalarda nonoperatif tedavi (NOM) yaygın olarak kabul görse de American Association for the Surgery of Trauma (AAST) yaralanma derecesi, laboratuvar parametreleri, transfüzyon gereksinimleri ve cerrahi ihtiyacı arasındaki ilişki hâlâ tartışmalıdır.

GEREÇ VE YÖNTEM: Bu retrospektif gözlemsel çalışmaya, üçüncü basamak bir cerrahi merkezde Ekim 2024-Mayıs 2025 tarihleri arasında yönetilen, radyolojik veya intraoperatif olarak doğrulanmış karaciğer laserasyonu olan 53 hasta dâhil edildi. Demografik veriler, vital bulgular, AAST derecesi, laboratuvar değerleri, transfüzyon gereksinimleri, görüntüleme kullanımı ve klinik sonuçlar kaydedildi. İstatistiksel analizlerde ANOVA, ki-kare/Fisher testleri ve lojistik regresyon kullanıldı.

BULGULAR: Hastaların ortalama yaşı 41.4 yıl olup, %67.9'u erkekti. Yaralanma mekanizması çoğunlukla trafik kazalarıydı (%56.6). Başvuru sırasında hastaların %64.2'sinde AAST derece I-II, %7.5'inde derece IV yaralanma saptandı. NOM başarısı %81.1 iken, %18.9 hastada cerrahi gereksinimi oldu. Hastane içi mortalite gözlenmedi. Hemogloblin ve hematokrit düşüşü, yaralanma derecesi veya cerrahi gereksinimi ile anlamlı ilişki göstermedi. Buna karşın, transfüzyon gereksinimleri şiddetle birlikte arttı: eritrosit süspansiyonu ($p=0.006$) ve taze donmuş plazma ($p<0.001$). Takip görüntülemelerinde ($n=25$) olguların %96'sında yaralanma derecesinin stabil veya iyileşmiş olduğu görüldü. Lojistik regresyon analizinde cerrahi için bağımsız bir prodüktör belirlenmedi.

SONUÇ: Karaciğer laserasyonlarında NOM, güvenli ve etkili bir tedavi seçeneğidir; bu kohortta mükemmel sonuçlar ve mortalite olmamasıyla dikkat çekmektedir. AAST derecesi tek başına cerrahi gereksinimini öngörmemiş olsa da, transfüzyon gereksinimleri yaralanma şiddeti ile korelasyon göstermiştir; bu da klinik karar verme sürecinde pratik göstergeler olarak değerlerini ortaya koymaktadır.

Anahtar sözcükler: de American Association for the Surgery of Trauma (AAST) derecesi, karaciğer travması, non-operative tedavi, transfüzyon

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