ORIGINAL ARTICLE

Intra-abdominal packing does not increase infection risk or mandate longer presumptive antibiotic therapy

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ABSTRACT

BACKGROUND: Damage control laparotomy allows for resuscitation and reversal of coagulopathy with improved mortality. Intra-abdominal packing is often used to limit hemorrhage. Temporary abdominal closure is associated with increased rates of subsequent intra-abdominal infection. The effect of increased duration of antibiotics is unknown on these infection rates. We sought to determine the role of antibiotics in damage control surgery.

METHODS: A retrospective analysis of all trauma patients requiring damage control laparotomy on admission to an ACS verified level one trauma center from 2011 to 2016 was performed. Demographic and clinical data including ability and time to attain primary fascial closure, as well as complication rates, were recorded. The primary outcome measure was intra-abdominal abscess formation following damage control laparotomy.

RESULTS: Two-hundred and thirty-nine patients underwent DCS during the study period. A majority were packed (141/239, 59.0%). No differences existed in demographics or injury severity between groups, and infection rates were similar (30.5% vs. 38.8%, P=0.18). Patients with infection were more likely to have suffered gastric injury (23.3% vs. 6.1%, P=0.003) than those without complication. There was no significant association between gram negative and anaerobic (Odds Radio [OR] 0.96, 95% confidence interval [CI] 0.87–1.05) or antifungal therapy (OR 0.98, 95% CI 0.74–1.31) and infection rate, regardless of duration on multivariate regression

CONCLUSION: Our study offers the first review of the effect of antibiotic duration on intra-abdominal complications following DCS. Gastric injury was more commonly identified in patients who developed intra-abdominal infection. Duration of antimicrobial therapy does not affect infection rate in patients who are packed following DCS.

Keywords: Antibiotics, damage control surgery, intra-abdominal abscess, packing, temporary abdominal closure.

INTRODUCTION

Trauma is the leading cause of death of patients ages 1–44 and hemorrhage is the leading cause of preventable death following injury. Key in the management of patients in hemorrhagic shock is to provide blood product resuscitation with correction of trauma-induced coagulopathy. Damage control surgery (DCL), first described in 1993, is an integral component of the overall damage control resuscitation strategy, as it allows for rapid hemorrhage control, temporary closure of the abdomen, followed by focused efforts on correction of coagulopathy and physiologic disturbances.[1] DCL has subsequently been widely adopted by the trauma community. However, the improvement in initial survival has led to recognition of increased infectious complications accompanying temporary closure of the abdominal wall.

Abdominal packing during DCL is an area of concern for development of post-operative infection. Retained packing material, typical cloth sponges, may serve as a reservoir for

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bacterial contamination, especially in the setting of a hollow viscous injury.[2,3] Among patients undergoing DCL, the rate of intra-abdominal abscess can be as high as 20–49% when abdominal packing is used.[4,5] A recent study demonstrated that the two variables that contributed most to postoperative abdominal infections were DCL and colon resections in trauma laparotomy patients.[6]

One strategy to mitigate these concerns is the use of presumptive antibiotics following DCL with intra-abdominal packing. Recommendations for presumptive antimicrobial therapy vary following DCL to 24 h or less or in other instances to a minimum of 24 h.[7] However, minimal evidence exists regarding the use or duration of presumptive antimicrobial therapy for DCL with retained intra-abdominal packing. Guidelines published by the Eastern Association of Trauma regarding prophylactic antibiotic use in abdominal trauma acknowledge that there were no studies identified to form an opinion on their use.[8] Therefore, we sought to evaluate risk factors associated with development of infection following DCL with intra-abdominal packing, as well as identify the influence of presumptive antibiotic duration on the rate of infectious complications.

MATERIALS AND METHODS

The University of Alabama at Birmingham Medical Center (UABMC) is an American College of Surgeons (ACS) verified level I trauma center that serves as a tertiary referral center for the state of Alabama, with approximately 3500 trauma admissions per year. We performed a retrospective review of all trauma patients admitted to UABMC from 2011 to 2016.

Study Population

Patients at least 18 years old admitted to the trauma service undergoing exploratory laparotomy at the time of admission were eligible for inclusion. Those patients undergoing damage control laparotomy, defined as laparotomy with temporary abdominal closure following injury, were included for analysis. Exclusion criteria included primary fascial closure at their initial operation or those with a traumatic hernia as the reason for temporary closure.

Study Parameters

The primary outcome of interest was the impact of prolonged presumptive antibiotic treatment on the prevention of intra-abdominal abscess following damage control laparotomy comparing those patients with and without packing. Secondary outcomes of interest were infectious complications among patients with and without intra-abdominal packing and hospital mortality.

Definitions

Prolonged antibiotic duration was defined as 5 days or greater of coverage against Gram-negative bacteria and anaerobes. Packing was identified exclusively as plain laparotomy pads. Wound complications were defined according to criteria determined by the Centers for Disease Control. Intra-abdominal abscess was defined by organisms cultured from a percutaneously sampled intra-abdominal fluid collection or the clinical identification of abscess upon re-exploration. Wound infection was defined as purulence in the superficial or deep space without intra-abdominal component or by positive bacterial culture. In addition, wounds requiring reopening due to clinical descriptions of infection were identified as infected.

Operative Procedure

Primary fascial closure was defined as primary suture approximation of the fascia. Fistula and dehiscence were identified clinically, with fistula defined as persistent communication between abdominal viscera and either the atmosphere or through the abdominal wall. Dehiscence was defined as any clinically apparent disruption of fascial closure.

The medical record was used to identify demographic and operative data. Operative reports were reviewed to determine the injury characteristics and reason and area for intra-abdominal packing. Antibiotic type and duration were identified from the medical record. Antimicrobials were broadly classified as providing Gram-positive (vancomycin and linezolid), Gram-negative and anaerobic (cefepime, pipercillin-tazobactam, and ertapenem), and antifungal (diflucan and micafungin) coverage. No other antimicrobials with broad spectrum coverage were utilized during the study period. Presumptive treatment with antibiotics for bacterial contamination, rather than established infection, was considered as treatment from the time of surgery on admission.

Statistical Analysis

Numeric values were expressed as mean ± standard deviation or proportion (percentage). Categorical variables were compared using Pearson's $\chi 2$ test, while continuous variables were compared using Student's t-test. Multivariate logistic regression was used to determine the association of prolonged presumptive Gram-negative and anaerobic antibiotic duration with development of intra-abdominal abscess. Covariates were identified during bivariate analysis as any comparator with $P<0.2$. Step-wise logistic regression was then performed to identify the appropriate covariates for multivariate analysis. An a priori $P\leq0.05$ was set to identify statistical significance.

RESULTS

During the study period, 239 patients were identified and included for analysis (Fig. 1). Patients overall were mostly male (82%) and injured by a penetrating mechanism (55.2%). The average age of patients was 38.1±14.70 years old. On average, patients suffered severe injury with a mean injury severity score of 25.7±13.77 and a mean lactate of 5.7±3.89 mMol/L.

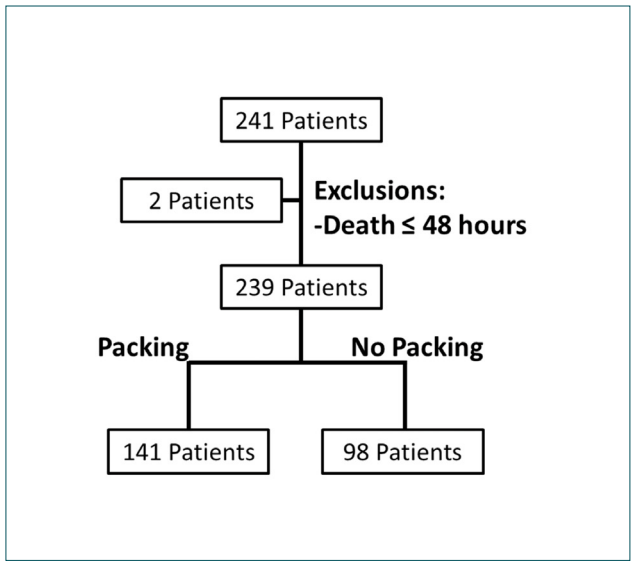

Figure 1. Flow diagram of patients managed with damage control laparotomy from 2011 to 2016

Transfusion volumes in the first 24-h were significant on average among all patients, with the number of units of packed red blood cells and total blood products transfused equal to 9.3±11.01 units and 19.5±22.29 units, respectively.

A slight majority of patients were managed with intra-abdominal packing during damage control laparotomy (141/239, 59.0%). There were no significant differences in demographics between the two groups (Table 1). Patients managed with or without intra-abdominal packing had similar markers of injury severity (Table 2). Mean injury severity score (P=0.37), admission lactate (P=0.40), and admission base excess (P=0.99) were all similar between the two groups. In addition, the proportion of patients requiring massive transfusion was the same (P=0.51).

Comparing antibiotic use between patients managed with or without intra-abdominal packing, there were no differences in the proportions of patients managed with presumptive broad spectrum Gram-positive (P=0.06), Gram-negative and anaerobic (P=0.07), or antifungal (P=0.59) therapy (Table 3). Further, there were no differences in mean duration (P=0.57) or duration of Gram-negative and anaerobic therapy after fascial closure (P=0.94). In regards to prolonged antimicrobial therapy, there were no differences between the two groups (P=0.24).

Intra-abdominal abscess was identified in 33.9% of patients managed with damage control laparotomy overall. There was no difference between patients managed with or without packing (P=0.18). In addition, there were no differences in rates of surgical site infection (P=0.21), enterocutaneous fistula (P=0.52), or anastomotic leak (P=0.65). Hospital mortality occurred in only 7.9% of patients and there was no difference between groups (P=0.92).

When comparing patients with damage control laparotomy and packing with or without intra-abdominal abscess formation, patients with abscess were more likely to suffer penetrating trauma (P<0.001) and were younger than those without abscess (P=0.004) (Table 4). Patients with abscess had a greater proportion of renal (P=0.01), gastric (P=0.003), and colorectal (P=0.01) injuries while those without abscess had a greater proportion of splenic injuries (P=0.01). Markers of injury severity were similar between patients with and with-

Table 1. Comparison of patients with damage control laparotomy with or without intra-abdominal packing

	Packing (n=141)	No packing (n=98)	P-value
Demographics			
Age (Years)	38.9±14.53	37.0±14.95	0.33
Gender (%)			
Male	114 (80.9)	82 (83.7)	0.58
Female	27 (19.1)	16 (16.3)	
Ethnicity (%)			
Caucasian	75 (53.2)	36 (36.7)	0.06
African American	63 (44.7)	58 (59.2)	
Latin American	3 (2.1)	3 (3.1)	
Asian American	0	1 (1.0)	
Mechanism of Injury (%)			
Blunt	74 (52.5)	33 (33.7)	0.004
Penetrating	67 (47.5)	65 (66.3)	

*Values presented as mean ± S.D. unless otherwise noted; **Estimates from Pearson's $\chi 2$ and Student's t-test for categorical and continuous variables, respectively.

Table 2. Comparison of patients with damage control surgery presence of packing

Injury	Packing (n=141)	No packing (n=98)	P-value
Injury Pattern (%)			
Hollow Viscus	89 (63.1)	54 (55.1)	0.21
Major Vascular	19 (13.5)	10 (10.2)	0.30
Pelvic	18 (12.8)	3 (3.1)	0.009
Splenic	49 (34.8)	22 (22.4)	0.04
Hepatic	23 (16.3)	49 (50.0)	<0.001
Renal	11 (7.8)	1 (1.0)	0.02
Pancreatic	11 (7.8)	10 (10.2)	0.52
Gastric	16 (11.3)	12 (12.2)	0.83
Small bowel	52 (36.9)	36 (36.7)	0.98
Colorectal	57 (40.4)	34 (34.7)	0.37
Number of Abdominal Operations	3.1±1.61	3.2±2.00	0.74
Time to Abdominal Closure (Days)	4.2±3.88	4.2±4.75	0.92
Achieve Primary Fascial Closure	131 (92.9)	90 (91.8)	0.76
Injury Severity Score	26.4±14.36	24.7±12.88	0.37
Admission Lactate	5.8±4.08	5.4±3.60	0.40
Admission Base Excess	−8.2±5.62	−8.2±5.83	0.99
Massive Transfusion (%)	46 (32.6)	36 (36.7)	0.51

*Values presented as mean ± SD unless otherwise noted; **Estimates from Pearson's $\chi 2$ and Student's t-test for categorical and continuous variables, respectively.

Table 3. Comparison of patients with damage control surgery by packing or not

Antimicrobial	Intra-abdominal packing (n=141)	No packing (n=98)	P-value
Additional broad spectrum gram positive therapy (%)	13 (9.2)	3 (3.1)	0.06
Duration (Days)	4.4±4.65	5.0±3.61	0.83
Aerobic and anaerobic therapy (%)	131 (92.9)	84 (85.7)	0.07
Duration (Days)	6.4±4.91	6.0±4.78	0.57
24 h	131 (92.9)	84 (85.7)	0.07
At least 5 days (%)	67 (47.5)	39 (39.8)	0.24
Duration following closure	3.2±4.46	2.8±4.29	0.48
Exceed closure (%)	89 (67.9)	59 (70.2)	0.72
Antifungal therapy (%)	14 (10.0)	12 (12.2)	0.59
Duration (Days)	6.7±4.08	6.9±7.29	0.94
Duration following closure	2.5±3.42	3.3±4.21	0.59
Exceed time to closure (%)			
Outcomes			
Length of stay (Days)	29.2±21.27	28.1±20.59	0.69
ICU length of stay (Days)	21.5±16.63	22.8±19.23	0.61
Hospital mortality (%)	11 (7.8)	8 (8.2)	0.92
Fascial dehiscence (%)	4 (2.8)	8 (8.2)	0.06
Enterocutaneous fistula (%)	6 (4.3)	6 (6.1)	0.52
Anastomotic leak (%)	8 (5.7)	7 (7.1)	0.65
Intra-abdominal abscess (%)	43 (30.5)	38 (38.8)	0.18
Surgical site infection (deep or superficial) (%)	52 (36.9)	44 (44.9)	0.21

*Values presented as mean ± S.D. unless otherwise noted; **Estimates from Fisher's exact or $\chi 2$ and Student's t-test for categorical and continuous variables, respectively.

Table 4. Comparison of patients with damage control surgery with intra-abdominal packing with or without intra-abdominal abscess

Demographics	Intra-abdominal abscess (n=43)	No abscess (n=98)	P-value
Age (Years)	33.6±11.70	41.2±15.09	0.004
Gender (%)			
Male	38 (88.4)	76 (77.6)	0.13
Female	5 (11.6)	22 (22.4)	
Ethnicity (%)			
Caucasian	15 (34.9)	60 (61.2)	0.02
African American	27 (62.8)	36 (36.7)	
Latin American	1 (2.3)	2 (2.0)	
INJURY			
Mechanism of Injury (%)			
Blunt	12 (27.9)	62 (63.3)	<0.001
Penetrating	31 (72.1)	36 (36.7)	
Injury Pattern (%)			
Hollow Viscus	34 (79.1)	55 (56.1)	0.009
Major Vascular	8 (18.6)	11 (11.2)	0.24
Pelvic	4 (9.3)	14 (14.3)	0.41
Splenic	9 (20.9)	40 (40.8)	0.02
Hepatic	8 (18.6)	15 (15.3)	0.63
Renal	7 (16.3)	4 (4.1)	0.01
Pancreatic	6 (14.0)	5 (5.1)	0.07
Gastric	10 (23.3)	6 (6.1)	0.003
Small bowel	16 (37.2)	36 (36.7)	0.96
Colorectal	24 (55.8)	33 (33.7)	0.01
Number of abdominal operations	3.3±1.87	3.0±1.48	0.29
Time to abdominal closure (Days)	4.9±4.85	3.9±3.35	0.14
Intra-abdominal packing (%)			
Perihepatic	2 (4.7)	9 (9.2)	0.36
Left upper quadrant	14 (32.6)	34 (34.7)	0.81
Mesenteric	11 (25.6)	23 (23.5)	0.79
Retroperitoneal	18 (41.9)	33 (33.7)	0.35
Pelvic	3 (7.0)	8 (8.2)	0.81
Injury severity score	24.3±12.26	27.2±15.16	0.27
Admission lactate	6.1±4.93	5.7±3.66	0.56
Admission base excess	−8.4±6.07	−8.1±5.44	0.76
Massive transfusion requirement (%)	12 (27.9)	34 (34.7)	0.43

*Values presented as mean ± S.D. unless otherwise noted, **Estimates from Pearson's $\chi 2$ and Student's t-test for categorical and continuous variables, respectively

out abscess. There were no differences in the proportion of patients with prolonged antibiotic therapy between patients with or without intra-abdominal abscess (P=0.87) (Table 5). Further, the duration of antimicrobial therapy was similar between groups.

Age, mechanism of injury, and gastric injury were identified as covariates for multivariate logistic regression. Prolonged Gram-negative and anaerobic therapy was not significantly associated with intra-abdominal abscess formation (P=0.88; OR 1.06) (Table 6). Regardless of duration of antimicrobial thera-

Table 5. Comparison of patients with damage control surgery with intra-abdominal packing with or without intra-abdominal abscess

Antımıcrobial	Intra-abdominal abscess (n=43)	No abscess (n=98)	P-value
Additional broad-spectrum gram-positive therapy (%)	0	13 (13.3)	0.01
Aerobic and Anaerobic Therapy (%)	39 (90.7)	92 (93.9)	0.50
Duration (Days)	6.1±4.57	6.6±5.06	0.59
24 h	39 (90.7)	92 (93.9)	0.50
At Least 5 Days (%)	20 (46.5)	47 (48.0)	0.87
Duration Following Closure	3.0±4.32	3.3±4.54	0.73
Exceed Closure (%)	24 (61.5)	65 (70.7)	0.31
Antifungal Therapy (%)	7 (16.3)	7 (7.2)	0.10
Duration (Days)	6.4±3.69	7.0±4.63	0.80
Duration Following Closure	3.3±4.19	1.9±2.70	0.45
Exceed Time to Closure (%)	6 (85.7)	5 (62.5)	

*Values presented as mean ± SD unless otherwise noted, **Estimates from Pearson's $\chi 2$ and Student's t-test for categorical and continuous variables, respectively

Table 6. Odds ratios (ORs) and associated 95% confidence intervals (CIs) for the association between duration of antimicrobial therapy and intra-abdominal infection among patients with damage control surgery and intra-abdominal packing.

	P-value	Odds Ratio	95% Confidence interval	
Intra-abdominal abscess			**Lower**	**Upper**
Broad gram negative and anaerobic coverage	0.70	0.75	0.176	3.225
At Least 24 h Antimicrobial Therapy	0.70	0.75	0.176	3.225
5 Days	0.88	1.06	0.483	2.333
7 Days	0.63	0.81	0.348	1.887
Duration	0.56	0.97	0.893	1.063
Past Closure	0.43	0.06	0.175	1.048
Antifungal	0.80	0.84	0.219	3.207

*Multivariate logistic regression adjusted for age, mechanism of injury, and gastric injury.

py, continuance past fascial closure, or type of antimicrobial, there were no significant associations with intra-abdominal abscess formation.

DISCUSSION

In this study, we identified that intra-abdominal packing was not associated with significantly increased rates of surgical site infection, either superficial or deep, when compared with patients managed with DCS without packing. Further, there was no difference in duration of antimicrobial therapy when comparing patients who did or did not develop intra-abdominal abscess. Most important, on multivariate regression, there was no significant association between antibiotic use or prolonged duration of therapy.

With the evolution of modern trauma care, DCL has taken a pre-eminent role in the initial operative management of the severely injured patient. However, there is increasing recognition that DCL is not without consequences of its own. Patients undergoing DCS suffer an increase in post-operative abdominal complications, including incisional hernia, fascial dehiscence, enterocutaneous fistula, and organ/space surgical site infection.[9-12] In addition, DCL is associated with increase in length of hospital stay, increased intensive care unit stay, and increase ventilator days.[13] As a result, there is growing sentiment questioning the current role of DCS in the current era of hemostatic, damage control resuscitation.[14]

For those patients with abdominal packing, the best way to decrease infectious rates is to remove packs as early as possi-

ble; this must be balanced with keeping the packs in place long enough to augment hemorrhage control during treatment of trauma-induced coagulopathy. Common practice is that packs should stay no <24 h with optimal time of removal around the 48-h mark.[1,6] The total duration of packing does not appear to be related to the development of intra-abdominal collections when looking at a 2–3-day time frame.[6] Similarly, we found no significant difference in infectious complications between groups that were packed versus those that were not. Importantly, we noted no significant difference in abscess formation, surgical site infection, enterocutaneous fistula, anastomotic leak, or hospital mortality. This opposes traditional thought that retained sponges increase risk of infectious complications due to the possibility of biofilm formation.[2,3]

During our study, we identified that prolonged use of antibiotics did not lead to a significant decrease in infectious complications between patients with and without packing. Importantly, we identified on both bivariate and multivariate analyses that the addition of broad spectrum antimicrobial coverage as well as increased duration of coverage for 5 days, 6 days, or simply beyond closure, were not significantly associated with decreased abscess formation. This appears to correspond to current literature of those undergoing DCL, with a rate of intra-abdominal abscess formation of 30–46%.[4,5]

Our study highlights the current trend in the literature away from prolonged presumptive antibiotic use after trauma laparotomy.[7,8,15] As seen in one study, describing patterns of antibiotic use in DCL for abdominal trauma identified that pre-operative antibiotics were a negative predictor of infection. Interestingly in that study, prolonged use of antibiotics and bowel injuries were positive predictors of increased infection rates.[16] Contrary to previously held beliefs and recommendations, our study suggests that prolonged antimicrobial use for presumptive therapy in patients following trauma laparotomy does not reduce infectious complications.

At present, it is unclear as to why some patients are more likely to develop surgical site infections over others. Injury patterns likely play some role as demonstrated in our study and through the literature. We identified that those with gastric injuries and requiring packing did have a significant increase in infectious complications, but this was true for both groups (those left packed versus no packs left) undergoing DCL. Curiously, we also demonstrated that patients with intra-abdominal abscess were significantly more likely to be associated with renal and colonic injuries as well. Likely, this mixture of associated injuries may reflect the higher rate of penetrating injury among patients with abscess. It is unclear if any one specific organ injury results in a higher rate of abscess of if there is a synergistic relationship among these injuries resulting in our findings.

One injury not seen in significantly higher rates among patients with intra-abdominal abscesses was those with splenic injuries. While it has been hypothesized that splenic injury and splenectomy be associated with higher rates of abscess, we saw no evidence of this in our population. Similarly unexpected, we identified that intra-abdominal abscess occurred in patients with a significantly younger age than those without this complication. We hypothesize that this likely relates to the higher rate of penetrating trauma among those patients with abscess and the multiple associated injuries they likely suffered, although this remains unclear.

The previous studies have identified decreased rates of intra-abdominal abscess formation with continuous peritoneal lavage when compared to patients with only negative pressure temporary closure of the abdomen.[17] Further, patients undergoing temporary abdominal closure with negative pressure therapy demonstrate decreased rates of intra-abdominal abscess formation compared with other techniques.[18] The ability to effectively drain the peritoneal cavity may allow for clearance of inflammatory cytokines that typically predispose patients for possible infection. This would seem to be supported in our study, given that the presence of retained packing material, antimicrobial use, and duration do not appear to influence the development of post-operative infection.

Our study is limited by its retrospective design as well as limitations in our medical record. As a result, we were unable to grade the degree of peritoneal contamination on initial or return laparotomy. In addition, differences in practice patterns may have further influenced outcomes. Finally, given that our study is from a single center, it is possible that our local microbiome may result in outcomes not applicable to all centers.

Conclusion

Despite its limitations, our study offers the only examination of the effect of antibiotic duration with packing during DCL. In patients that require DCL, intra-abdominal packing is not associated with significantly increased rates of surgical site infection, either superficial or deep, when compared with patients managed with DCS without packing. Antibiotics should be started before operation. There is no association between duration of antibiotic use and whether a patient managed with DCL developed intra-abdominal abscess. Further study is needed to identify the best antibiotic regimen for those patients that require DCL.

Presentation: This study was presented as a quick-shot presentation at the 2018 Clinical Congress of the ACS in 2018.

Ethics Committee Approval: This study was approved by the University of Alabama at Birmingham Clinical Research Ethics Committee (Date: 01.10.2017, Decision No: X161219003).

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J.K.; Design: P.H., R.U., P.B.; Supervision: P.H., J.K., P.B.; Fundings: J.K.; Materials: P.H., V.P., J.K., P.B.; Data: P.H., R.U., V.P., T.C.; Analysis: P.H., R.U., V.P., T.C., J.K., P.B.; Literature search: P.H., R.U., V.P., T.C., J.K., P.B.; Writing: P.H., R.U., V.P., T.C., J.K., P.B.; Critical revision: P.H., R.U., V.P., T.C., J.K., P.B.

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ORİJİNAL ÇALIŞMA - *ÖZ*

Karıniçi tampon enfeksiyon riskini artırmaz veya daha uzun sürecek tahmini antibiyotik tedavisini zorunlu kılmaz

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AMAÇ: Hasar kontrol laparotomisi, mortaliteyi iyileştirerek resüsitasyona ve koagülopatinin tersine çevrilmesine olanak sunar. Kanamayı sınırlamak için genellikle karıniçi tampon kullanılır. Geçici batın kapama, müteakip batın içi enfeksiyon oranlarının artmasıyla ilişkilidir. Uzamış antibiyotik süresinin bu enfeksiyon oranları üzerindeki etkisi bilinmemektedir. Bu çalışmada, antibiyotiklerin hasar kontrol cerrahisindeki rolünü belirlemeye çalıştık.

GEREÇ VE YÖNTEM: 2011-2016 yılları arasında ACS onaylı bir birinci düzey travma merkezine kabul edildikten sonra hasar kontrol laparotomisi gerektiren tüm travma hastalarının retrospektif analizi yapıldı. Komplikasyon oranlarının yanı sıra, primer fasiyal kapanma aşamasına ulaşma durumu ve süresi dahil olmak üzere demografik ve klinik veriler kaydedildi. Birincil sonuç ölçütü, hasar kontrol laparotomisini takiben karıniçi apse oluşumuydu.

BULGULAR: Çalışma süresi boyunca 239 hastaya hasar kontrol cerrahisi uygulandı. Çoğunluğuna tampon yerleştirildi (141/239, %59.0). Gruplar arasında demografik bilgiler veya yaralanma şiddeti açısından fark yoktu ve enfeksiyon oranları benzerdi (%30.5'e karşı %38.8, p=0.18). Enfeksiyonu olan hastalarda komplikasyon olmayanlara göre mide hasarı gelişme olasılığı daha yüksekti (%23.3'e karşı %6.1, p=0.003). Çok değişkenli regresyon analizinde süreden bağımsız olarak gram negatif ve anaerobik (OR 0.96, %95 CI 0.87-1.05) veya antifungal tedavi (OR 0.98, %95 CI 0.74-1.31) ve enfeksiyon oranları arasında anlamlı bir ilişki yoktu.

TARTIŞMA: Çalışmamız, antibiyotik süresinin hasar kontrol cerrahisi sonrası karıniçi komplikasyonlar üzerine etkisinin ilk derlemesidir. Mide hasarı, karıniçi enfeksiyon gelişen hastalarda daha yaygın olarak tanımlanmıştır. Hasat kontrol cerrahisi sonrası tampon yerleştirilen hastalarda antimikrobiyal tedavinin süresi enfeksiyon oranını etkilememektedir.

Anahtar sözcükler: Antibiyotikler; geçici batın kapama; hasar kontrol cerrahisi; karıniçi apse; tampon.

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