

Abstract

Introduction: Damage control surgery (DCS) has been widely used in trauma patients and its use in Acute Care Surgery (ACS) has been rapidly expanding; however, surgical strategies and factors associated with success of definitive fascial closure (DFC) are not as clearly defined as in the trauma literature. The objective of our study was to identify risk factors for failure of DFC in ACS in patients with severe secondary peritonitis (SSP).
Methods: A retrospective review (2004-2010) of a prospectively collected data on patients with SSP and DCS was performed at a level one trauma/ACS center. Demographics, presentation, and management variables were used to compare primary DFC and failure of fascial closure after the initial laparotomy.
Results: A total of 217 patients, (54% male) median age 55 (IQR 40-70) underwent DC for SSP. Post-operative adverse events (failure of anastomosis) were the cause of peritonitis in 141 (65.6%) and primary inflammatory (perforated viscus /abscess) caused peritonitis in 74 (34%). Median APACHE was 16 (11-21). DFC was achieved in 111/217 (51%). Failure of DFC occurred in 106 (49%) patients; of these, 72 were managed with skin only closure (SOC) 72/106 (68%), 6 underwent split thickness skin grafting (STSG), and 5 closed by wound granulation. DFC failure patients also presented greater incidence of persistent infections (56.3% vs. 23.4%, p<0.001) anastomotic leaks (21.2% vs. 6.3%, p=0.001), and longer length of stay in hospital and ICU (Median 30 days [IQR=17-47] vs. 21 days [IQR=14-32], p=0.006 and Median 13 days [IQR=7-24] vs. 9 days [IQR=5-16], p=0.002 respectively). The median number of laparotomies after the index (re-laparotomies) was two (IQR 1-3) in the DFC versus four (IQR= 2-7) laparotomies in the SOC group (p<0.001). Median DFC closure time was 5 days (IQR 3-10) compared to 12 days (IQR=8-18) in the SOC group (p<0.001). Overall mortality was 42 (19.5%), mortality in patients with DFC was 12/111 (10.8%) compared to 30/106 (28.3%) in failure of DFC (p<0.001).
Conclusion: The most significant factors associated with DFC are the total number of laparotomies and time required to obtain control of abdominal cavity contamination from the original insult. Our data show that the median of two re-laparotomies carried out preferably in the first 5 days from the initial surgery are conducive to DFC success. DFC failure is associated with increased intra-abdominal septic complications. Furthermore, SOC is successful in approximately 70% of DFC failure patients and it may take up to a week longer in order to achieve SOC.

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Damage control surgery (DCS) has been widely used in trauma patients and its use in Acute Care Surgery (ACS) has been rapidly expanding; however, surgical strategies and factors associated with success of definitive fascial closure (DFC) are not as clearly defined as in the trauma literature. The objective of our study was to identify risk factors for failure of DFC in ACS in patients with severe secondary peritonitis (SSP).

Methods

A retrospective review (2004-2010) of a prospectively collected data.

Design: Case-control study.

Site: A civilian private hospital, level one trauma/ACS center, with 60 beds in ICU.

Patients:

CASES: Patients with severe secondary peritonitis and Damage control surgery with success of definitive fascial closure

CONTROLS: Patients with severe secondary peritonitis and Damage control surgery with failure of definitive fascial closure

Data:

From web-based Institutional registry PERIT, that included: demographics, and surgical management variables. This study was approval by institutional IRB

Statistical Analysis: Discrete variables are presented as amounts and percentages. Continuous variables as range, median and interquartile range (IQR). Categorical variables were compared by the Fisher exact test. Continuous variables were compared by the two sided Kruskal-Wallis equality-of-populations rank test. Calculations were made by Stata 12 (StataCorp, College Station, TX, USA). A p value of less than 0.05 was considered statistically significant. A bivariate analysis was performed.

Results

Table 1. General characteristics

	Global n=217
Age, median (IQR), years	55 (40-70)
Sex, male, n(%)	117 (54)
APACHE II, median (IQR)	16 (11-21)
DFC, n(%)	111 (51)
Failure DFC, n(%)	106 (49)
Stay, mean±SD, days	
ICU	14.1 ± 9.4
Hospital	33.2 ± 31.1
Overall mortality, n(%)	42 (19.5)

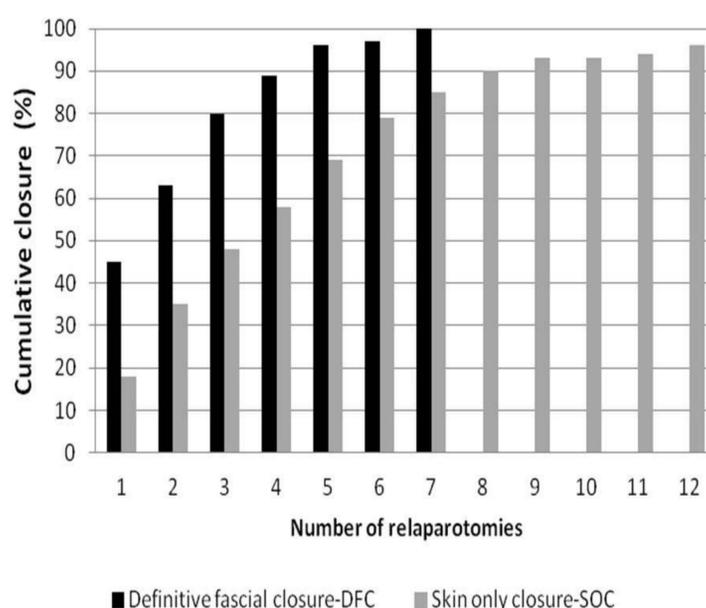
Table 2. Abdominal Closure and complications by group.

Variables	DFC, n=111	Failure DFC, n=106	p value
Abdominal Closure, n(%)			NA
Fascial Closure	111 (100)	0	
Skin Only Closure		72 (68)	
Split thickness skin grafting		6 (5.7)	
Wound granulation		5 (4.7)	
Closure Time,Median (IQR), days	5 (3 – 10)	12 (8 – 18)	<0.001

Table 2.(cont.) Abdominal Closure and complications by group.

Variables	DFC, n=111	Failure DFC, n=106	P value
Complications, n(%)			
Persistent Infections	26.4	56.3	<0.001
Anastomotic leaks	6.3	21.2	0.001
Stay, Median (IQR), days			
ICU	9 (5 – 16)	13 (7 – 24)	0.002
Hospital	21 (14 – 32)	30 (17 – 47)	0.006
Number of relaparotomies, median (IQR)	2 (1 – 3)	4 (2 – 7)	<0.001
Mortality, n(%)	12 (10.8)	30 (28.3)	<0.001

Abdominal wall closure by numbers of relaparotomies



Conclusion

The most significant factors associated with DFC are the total number of laparotomies and time required to obtain control of abdominal cavity contamination from the original insult. Our data show that the median of two re-laparotomies carried out preferably in the first 5 days from the initial surgery are conducive to DFC success. DFC failure is associated with increased intra-abdominal septic complications. Furthermore, SOC is successful in approximately 70% of DFC failure patients and it may take up to a week longer in order to achieve SOC.