



Role of Laparoscopy in Abdominal Blast Injuries

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Abstract

Abdominal organ injury in an impact type is continuously trying for finding. An air holding back stomach viscus is generally helpless against impacts of impact injury. Impact Injuries coming about when an individual is hit by particles induced with savage power from a blast. To assess the role of laparoscopy in administration of stomach impact wounds. This was a review, forthcoming, case series study that conducted on 40 patients with stomach shoot wounds at Maadi military clinic Kasr elainy clinical school from September 2018 to September 2020. Comparative statistics between 2 groups revealed; highly significant decrease Grade injury, Operative time, Intraoperative complications, successful group; compared failed group. Comparative study between 2 groups revealed; highly significant decrease First bowel motion days, post-operative pain Hospital stay days, successful group; significant decrease wound infections increase seroma, successful group, significant decrease mortality, successful group (4.5%); compared failed group (33.3%) ($p = 0.018$). There was no statically significant difference between regarding basic clinical data, Laparoscopic exploration multiple extra-abdominal injuries and Re-surgery. Logistic regression analysis shows that; after applying (Forward method) entering some predictor variables; increase age; increase Grade injury Multiple extra-abdominal; had independent effect on increasing probability conversion occurrence; with significant statistical difference. Laparoscopy patients with stomach injury, shown protected viable demonstrative remedial device, with better post-employable results including: less torment, difficulties mortality, short emergency clinic stay, alongside prior first gut movement.

Keywords: Abdominal Trauma, Blast Injuries, Injuries, Laparoscopy.

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1. Introduction

Impact Injuries coming about when an individual is hit by particles induced with savage power from a blast. Impact causes pneumonic blackout and discharge, gash of other thoracic and stomach viscera, cracked ear drums, and minor impacts in the focal sensory system [1]. Stomach organ injury in an impact wave is continuously trying for determination. An air holding back stomach viscus is generally powerless against impacts of impact wave. In any persistent presented to an impact wave who gives an intense mid-region, a stomach organ injury is to be kept in a clinical doubt [2]. Most normal stomach viscera helpless against the impact wave are those that containing air. Nearness to site of impact wave, bearing and power of essential impact wave (PBW), relative place of body and a piece of the midsection struck by essential impact wave and the impact of different items in mid-region and in the empty viscera foresee type and number of the stomach organs harmed [3]. PBW might prompt inside hole, drain, mesenteric shear wounds, strong organ slashes, and testicular break. A careful clinical consciousness of show of stomach organ wounds, sharp clinical perception commended with X-beam and

sonography mid-regions are helpful in finding of PBI [4]. Liver injury in essential impact wave includes sub capsular hematoma or the slash that can be disengaged or connected with other organ injury. Liver slash can be single, different or totally broke. In splenic injury, frequently essential impact wave causes huge inclined toward full thickness cut or the hilar injury, which considers splenectomy alluring in the vast majority of cases. Sub capsular hematoma and little gash can be available in few cases [5]. Unmistakable preoperative determination and the choice to have careful intercession depend on sharp clinical evaluation and perception and the utilization of plain radiograph of midsection and FAST (Focused Assessment with Sonography for Trauma). Laparoscopy keeps on being unequivocal figure last determination [6]. In laparoscopic, the overall dreariness and mortality, complexity rates, and missed injury rates are low and equivalent with open methodologies. Moreover, a wide assortment of intra-stomach pathology can be addressed laparoscopically including wounds to the entrail, stomach, liver, spleen, and pancreas [7]. The aim of the study was to assess the role of laparoscopy in administration of stomach impact wounds.

2. Patients and methods

This was a review, forthcoming, case series study that conducted on 40 patients with stomach shoot wounds at Maadi military clinic Kasr Elainy clinical school from September 2018 to September 2020.

2.1. Inclusion criteria

Patients who haemo-powerfully steady, Patients with thought stomach wounds, Age over 12 years age and Spleen all injury grades.

2.2. Exclusion criteria

Patients with respiratory cardiovascular issues, sever significant shock (septic shock), Pregnant female third trimester, Patients with Recent stomach medical procedure and Loss area that forestall pneumoperitoneum.

2.3. Techniques

Mid-region was insufflated by veress needle, single port over umbilicus for camera more 2 ports were embedded by site injury for making demonstrative laparoscopy. Every patient had revived by Advanced Trauma Life support at Accident Emergency Department before admission careful ward. Injured patients were ordered by organ injury scaling framework which evaluated 1 through 6 for every organ, 1 being least extreme 5 most serious injuries from which patient might make due Grade 6 wounds not salvageable. All patients were exposed to full clinical evaluation, C.B.C, pee investigation, plain X-beam erect mid-region, Focused stomach sonography for injury (FAST) and Pelvi-Abdominal figured tomography (CT) stable patient with negative FAST.

2.4. Post-employable workup

The first entrail movement primary oral admission, Amount of anti-toxin pain relieving treatment, The span clinic stay, Postoperative Complications (seroma, postoperative agony, chest confusions, fever without liquid assortment, careful injury hematoma, port site hernia, careful injury contamination, intraabdominal cancer) and Need for re-investigation because missed wounds.

3. Results and discussion

Impact injury phenomenal remains inadequately grasped by most clinicians outside areas dynamic fighting. PBI results from cooperation shoot wave with body normally influences gas-containing organs such as ear, lungs, gastrointestinal plot [2]. PBI produces range injury from minor, single various organ injury. Genuine rate stomach injury obscure. related wounds rarely found regular citizen practice [2]. Our study showed that comparative statistics between 2 groups revealed non-significant difference regards all basic clinical data ($p > 0.05$). Cocco et al., announced that, mean age of these patients was 32.24 years. These patients, 121 had sign for guaranteed laparotomy 197 didn't [8]. Lin et al., detailed that, 2 gatherings were comparable regarding sex, age, important

bodily functions ED, related wounds, TAE before medical procedure, critical wounds requiring remedial mediations (all, $P > .05$) [9]. Near concentrate on between 2 gatherings uncovered; exceptionally huge expansion hemoglobin, platelets, fruitful bunch; contrasted with bombed bunch ($p < 0.05$ separately). Matsevych et al., announced that, SBP, Ps, Hb, pH, lactate, values couldn't indicator factors for confusion two gatherings [10]. Near concentrate on between 2 gatherings uncovered; exceptionally huge reduction Grade injury, Operative time, Intraoperative entanglements, effective bunch; contrasted with bombed bunch ($p < 0.05$ separately). Nicolau et al., likewise announced that, usable time length emergency clinic stays including escalated care was decreased for contrasted with changes. that may, degree injury was higher last option [11]. Then again, Gao et al., detailed that, activity time was comparable these two gatherings (LP versus LT: 202.2 versus 194.11 min, $p = 0.295$) while post-usable entanglement rate was somewhat decreased LP bunch (7.7% versus 13.5%) with no measurable importance ($p = 0.383$) [12].

Butler et al., detailed that, most widely recognized stomach injury was entrail injury (64.6%), trailed by splenic injury (11.4%) [13]. Amutha et al., likewise announced that, most widely recognized discoveries during were injury strong organs (both spleen and liver) which happened around 14 patients. Spleen most regularly harmed organ. Grade I II splenic wounds happened around 10 patients (10%). Grade I II liver wounds happened around 4 patients (13.2%). Retroperitoneal hematoma, alongside omental draining mesenteric draining was tracked down around 5 patients (16%). Mesenteric vascular injury little entrail hole was tracked down each 2 patients (6.6%). There were no discoveries around 7 patients (23%) [14]. Near concentrate on between 2 gatherings uncovered; exceptionally critical abatement First entrail movement days, post-usable agony Hospital stay days, effective bunch; contrasted with bombed bunch ($p < 0.05$ separately). Matsevych et al., detailed that, was utilized 318 stable injury patients. 35 patients gave obtuse 283 with infiltrating stomach wounds. Change rate was 11.7% for entering 22.9% for gruff stomach injury patients. most well-known justification for transformation was consistent intraabdominal draining that couldn't controlled rapidly. Was trailed by various complex wounds, hemodynamic unsteadiness, intraoperative perception issues. Demonstrative was acted 45%, remedial 55% cases. There were no missed wounds [10]. Abo-Elhoda et al., likewise detailed that, general frequency mortality was 5.4% [15]. Then again, Cocco et al. announced that, most widely recognized difficulty was pneumonia (7/121, 5.8%). death rate was 2.5% all patients who passed on were haemodynamically temperamental on show kicked bucket working room [8].

Table 1: Comparison between 2 groups regards basic clinical data.

Variable		Failed laparoscopy group (18)	Successful laparoscopy group (22)	Mann-Whitney's U test
		Median (IQR)	Median (IQR)	P value
Age (years)		40.5 (27 – 43)	25.5 (22 – 48)	= 0.4869
MAP (mmHg)		86 (76 – 90)	81.5 (77 – 87)	= 0.4696
HR (beat/min)		103 (95 – 110)	110 (95 – 112)	= 0.5290
RR (breath/min)		22 (20 – 24)	21.5 (20 – 22)	= 0.1538
Variable		Failed laparoscopy group (18)	Successful laparoscopy group (22)	Chi square test
		P value		
DM	+ve	5 (27.8%)	6 (27.3%)	= 0.9720
HTN	+ve	8 (44.4%)	8 (36.4%)	= 0.6083

Comparative statistics between 2 groups revealed non-significant difference regards all basic clinical data ($p > 0.05$).

Table 2: Comparison between 2 groups regards injury data.

Variable		Failed laparoscopy group (18)	Successful laparoscopy group (22)	Chi square test
				P value
Lower thorax (Diaphragm)	+ve	2 (11.1%)	4 (18.2%)	= 0.5384
Rt hypochondrium	+ve	4 (22.2%)	6 (27.3%)	= 0.7171
Lt hypochondrium	+ve	1 (5.6%)	8 (36.4%)	= 0.021*
Rt iliac	+ve	9 (50%)	0 (0%)	= 0.0002**
Lt iliac	+ve	3 (16.7%)	2 (9.1%)	= 0.4767
Rt flank	+ve	6 (33.3%)	0 (0%)	= 0.0037**
Lt flank	+ve	2 (11.1%)	1 (4.5%)	= 0.4387
Back	+ve	0 (0%)	0 (0%)	= 1.000
Umbilical	+ve	9 (50%)	12 (54.5%)	= 0.7773
Epigastric	+ve	4 (22.2%)	10 (45.5%)	= 0.1302
Supra-pubic	+ve	1 (5.6%)	6 (27.3%)	= 0.0758
Rt lumbar	+ve	3 (16.7%)	3 (13.6%)	= 0.7920
Lt lumbar	+ve	2 (11.1%)	2 (9.1%)	= 0.8343

Comparative study between 2 groups revealed; significant increase Lt hypochondrium, successful group; compared failed group ($p < 0.05$). Comparative study between 2 groups revealed; highly significant decrease Rt iliac, Rt flank, successful group; compared failed group ($p < 0.05$ respectively). Comparative study between 2 groups revealed non-significant difference regards all remaining ($p > 0.05$).

Table 3: Comparison between 2 groups regards operative data.

Variable		Failed laparoscopy group (18)	Successful laparoscopy group (22)	Mann-Whitney's U test
		Median (IQR)	Median (IQR)	P value
Grade of injury (1 to 6)		3 (3 – 4)	2 (2 – 3)	= 0.00015**
Operative time (min)		160 (150 – 185)	110 (100 – 120)	< 0.0001**
Variable		Failed laparoscopy group (18)	Successful laparoscopy group (22)	Chi square test
Injured organs	Bladder	1 (5.6%)	2 (9.1%)	= 0.022*
	Collection	0 (0%)	1 (4.5%)	
	Diaphragm	0 (0%)	3 (13.6%)	
	Kidney	4 (22.2%)	1 (4.5%)	
	Large bowel	3 (16.7%)	1 (4.5%)	
	Liver	5 (27.8%)	0 (0%)	
	Pancreas	1 (5.6%)	0 (0%)	
	Small bowel	1 (5.6%)	5 (22.7%)	
	Spleen	1 (5.6%)	6 (27.3%)	
	Stomach	2 (11.1%)	3 (13.6%)	
Multiple extra-abdominal injuries	+ve	12 (66.7%)	8 (36.4%)	= 0.0597
Intraoperative complications	+ve	12 (66.7%)	2 (9.1%)	= 0.0002**
Laparoscopic exploration	Intraabdominal injury	18 (100%)	22 (100%)	= 1.000

Comparative statistics between 2 groups revealed; highly significant decrease Grade injury, Operative time, Intraoperative complications, successful group; compared failed group (p < 0.05 respectively). Comparative statistics between 2 groups revealed non-significant difference regards Laparoscopic exploration multiple extra-abdominal.

Table 4: Comparison between 2 groups regards post-operative outcome data.

Variable		Failed laparoscopy group (18)	Successful laparoscopy group (22)	Mann-Whitney's U test
		Median (IQR)	Median (IQR)	P value
First bowel motion (days)		2.5 (2 – 3)	1.5 (1 – 2)	= 0.0001**
Post-operative pain (VAS)		8.5 (8 – 9)	5 (5 – 6)	< 0.0001**
Hospital stay (days)		9 (6 – 11)	5 (5 – 6)	= 0.0008**
Variable		Failed laparoscopy group (18)	Successful laparoscopy group (22)	Chi square test
Complications	Intraabdominal abscess (A)	2 (11.1%)	1 (4.5%)	= 0.015*
	Chest complications (C)	6 (33.3%)	3 (13.6%)	
	Fever without fluid collection (F)	3 (16.7%)	6 (27.3%)	
	Leakage (L)	3 (16.7%)	0 (0%)	
	Surgical wound hematoma (WH)	0 (0%)	1 (4.5%)	
	Surgical wound infection (WI)	4 (22.2%)	2 (9.1%)	
Mortality rate	+ve	6 (33.3%)	1 (4.5%)	= 0.018*
Re-surgery	+ve	4 (22.2%)	1 (4.5%)	= 0.0968

Comparative study between 2 groups revealed; highly significant decrease First bowel motion days, post-operative pain Hospital stay days, successful group; compared failed group (p < 0.05 respectively). Comparative study between 2 groups revealed; significant decrease wound infections increase seroma, successful group; compared failed group (p = 0.015). Comparative study between 2 groups revealed; significant decrease mortality, successful group (4.5%); compared failed group (33.3%) (p = 0.018).

Table 5: Relation between conversion rate some parameters.

Variable		Conversion group (18)	No conversion group (22)	Mann-Whitney's U test
		Median (IQR)	Median (IQR)	P value
Age		40.5 (27 – 43)	25.5 (22 – 48)	= 0.4869
Grade of injury (1 to 6)		3 (3 – 4)	2 (2 – 3)	= 0.00015**
Variable		Conversion group (18)	No conversion group (22)	Chi square test
Injured organs	Bladder	1 (5.6%)	2 (9.1%)	= 0.022*
	Collection	0 (0%)	1 (4.5%)	
	Diaphragm	0 (0%)	3 (13.6%)	
	Kidney	4 (22.2%)	1 (4.5%)	
	Large bowel	3 (16.7%)	1 (4.5%)	
	Liver	5 (27.8%)	0 (0%)	
	Pancreas	1 (5.6%)	0 (0%)	
	Small bowel	1 (5.6%)	5 (22.7%)	
	Spleen	1 (5.6%)	6 (27.3%)	
Stomach	2 (11.1%)	3 (13.6%)		
Multiple extra-abdominal injuries	<u>+ve</u>	12 (66.7%)	8 (36.4%)	= 0.0597
Mortality rate	<u>+ve</u>	6 (33.3%)	1 (4.5%)	= 0.018*
Re-surgery	<u>+ve</u>	4 (22.2%)	1 (4.5%)	= 0.0968

Comparative study between 2 groups revealed; highly significant increase Grade injury, kidney liver mortality, Conversion group (p < 0.05 respectively). Comparative study between 2 groups revealed non-significant difference regards age, multiple extra-abdominal Re-surgery (p > 0.05).

Table 6: Logistic regression model for Factors affecting conversion occurrence using Forward method.

Predictor Factor	Coefficient	OR	P value
(Constant)	-9.50397		
Grade of injury	2.73078	15.3449	0.0025**
Multiple extra-abdominal injuries	2.78496	16.1992	0.01*

Logistic regression analysis shows that; after applying (Forward method) entering some predictor variables; increase age; increase Grade injury Multiple extra-abdominal; had independent effect on increasing probability conversion occurrence; with significant statistical difference.

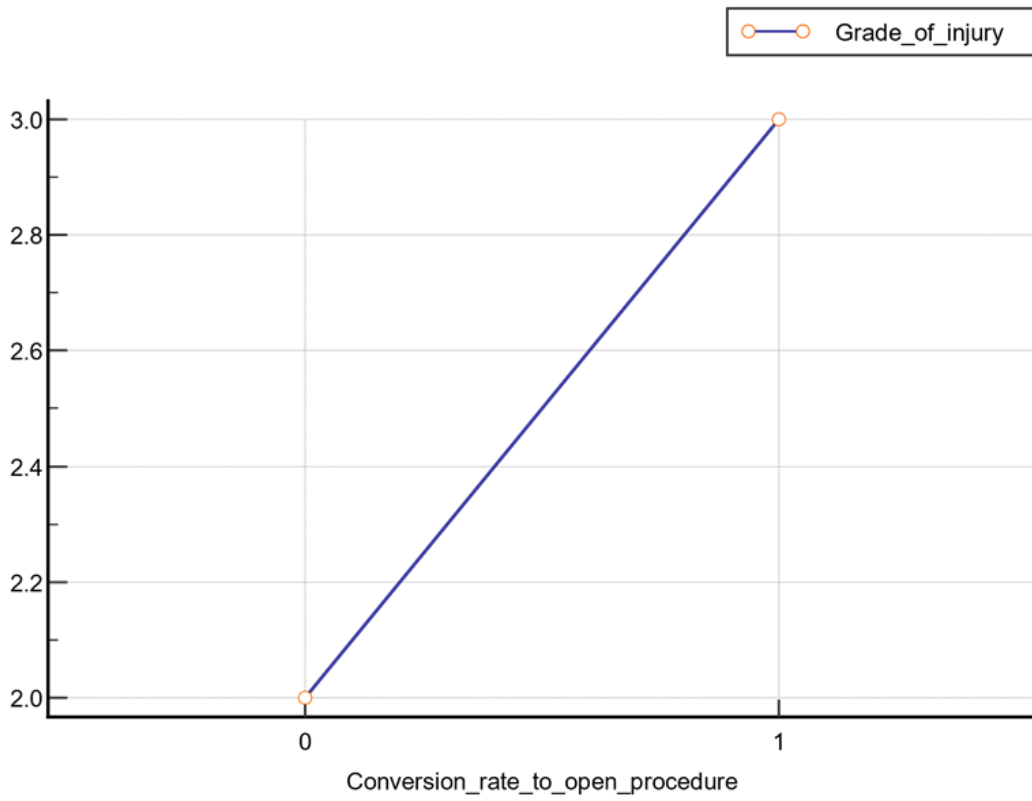


Figure 1: Correlation between conversion occurrence Grade injury.

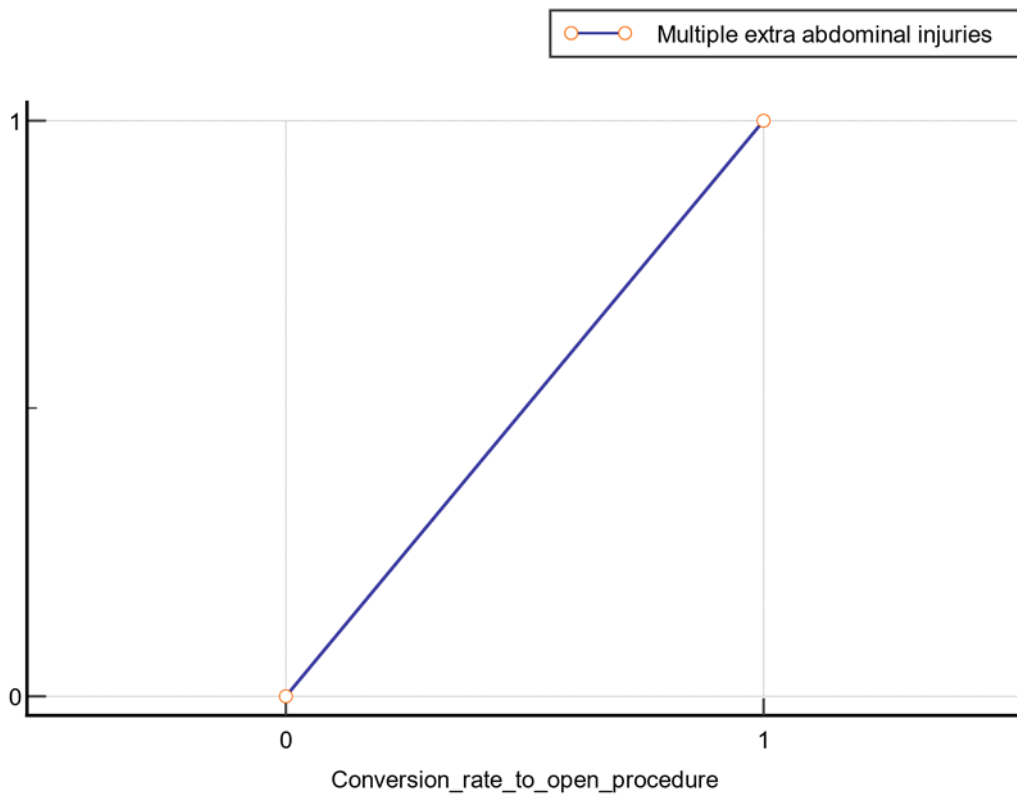


Figure 2: Correlation between conversion occurrence multiple extra-abdominal.

4. Conclusions

Laparoscopy patients with stomach injury, shown protected viable demonstrative remedial device, with better post-employable results including: less torment, difficulties mortality, short emergency clinic stay, alongside prior first gut movement. In any case, high grade wounds numerous additional stomach wounds advanced age significantly affected expanding likelihood change wounds. Further relative examinations with enormous scope huge number cases expected work on logical proof review.

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