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Original Research Article

Pattern and outcomes of colonic injuries among a sample of Iraqi patients

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ABSTRACT

Background: Colonic injury is one of the frequent injuries affecting different age groups especially young population. It is potentially lethal in its course and commonly associated with significant injuries to other organs. The aim of this study was to describe the pattern of presentation, management modalities and mortality of colonic injuries among a sample of Iraqi patients.
Methods: This is prospective study on 75 patients who were admitted to the general surgical ward of Al-Khadimya teaching hospital, Baghdad-Iraq, with colonic injury and had surgical treatment during a period of two years. The clinical parameters included: site of colonic injuries, mode of colonic injury management shock presenting in the emergency room degree of contamination (mild, moderate, and severe), and associated intra-&extra- abdominal injuries.
Results: Majority of patients were male. Mean age of sample was 28.47 years. The commonest site of injury was transverse, sigmoid, and descending colon. Primary repair was the first modality followed by repair and proximal colostomy. The overall mortality was 26/75 (35%). Eighteen deaths (71%) occurred in the first 24 hours most of them due to associated major injuries and irreversible shock. Eight deaths (29%) occurred after 24 hours all of them due to septic complications.
Conclusions: Primary repair is the main approach in colonic repair. In the absence of shock, associated injuries, or gross faecal soiling, primary repair may be considered. Mortality is considered high and need to be investigated in future research.

Keywords: Colonic, Injuries, Iraq, Outcomes

INTRODUCTION

Over recent years trauma surgeons have seen a revolution in the management of colonic injury. In 1944, Ogilvie stated ‘‘the greatest single factor in the improved results is the exteriorization of colon injuries.[1] This wartime strategy of colostomy or exteriorization led post war surgeons to consider primary repair to be unsafe. Stone published the first trial to randomize between primary repair and colostomy in1979 and since then, surgeons have expanded the use of primary repair to a point where a consensus has been reached about the safety and efficacy of primary repair or resection and primary anastomosis for the majority of colonic wounds.[2-8]

Some authors have suggested colostomy should be abandoned in the urban trauma setting.[9-12] In recent years, primary repair and resection and primary anastomosis have also been used successfully in wartime injuries of the colon.[13,14] Patients who have been injured by higher calibre weapons or with altered ammunition. Use of these weapons means increasing numbers of patients present

with exsanguination and critical physiological instability. Ongoing hemorrhage leads to the onset of a cycle of three inter-related variables, metabolic acidosis, profound hypothermia and a clinically obvious coagulopathy. These factors reinforce each other, with hypothermia and acidosis worsening the coagulopathy in severely injured patients.[16,17] The triad of hypothermia, acidosis and coagulopathy has been called a 'bloody vicious cycle', which if not interrupted is rapidly fatal.[18,19] This realization has led to the concept of 'damage control', which sees surgery as part of the process of resuscitation rather than an end in itself.

In a 'damage control' laparotomy for a critically wounded and exsanguinations patient the surgeon focuses on achieving hemostasis and preventing uncontrolled spillage of intestinal contents and urine, the laparotomy is abbreviated, and the surgeon expends his or her efforts restoring the patient's deranged physiology in the surgical intensive care unit.[18,20] Delayed gastrointestinal reconstruction can then be achieved following full hemodynamic resuscitation and restoration of coagulation variables to normal.[21-23]

There are essentially three therapeutic strategies in the surgical management of colonic injuries. Primary repair, colostomy, and lastly, exteriorized repair. Colostomy and exteriorized repairs minimize the risk of leakage at the expense of requiring a second operation. Primary repairs are desirable provided they do not leak.

The conditions under which primary repair can safely be performed in which diversion remains controversial, although few investigators have demonstrated that virtually all abdominal colon injuries can be safely managed by primary repair, the majority of reports advocate that primary repair be considered only under certain guidelines: less than 6 hours between injury and operation, hemodynamically stable/minimal blood loss, less than 50% circumferential colonic wall is injured, no gross faecal contamination, absence of associated other intra-abdominal injury. Little is known about the presenting features of colonic injuries in a country with long standing history of war. The aim of this study was to describe the pattern of presentation, management modalities and mortality of colonic injuries among a sample of Iraqi patients.

METHODS

This is prospective study included 75 patients with mean age of 28.47 years who were admitted to the general surgical ward of Al-Khadimya teaching hospital, Baghdad-Iraq. The patients suffered colonic injury and had surgical treatment during a period of two years. The clinical parameters included: time from injury to surgery, shock presenting in the emergency room (systolic blood pressure less than 90 mmHg), site and nature of injury, degree of contamination (mild, moderate, severe) type of surgical treatment, associated intra and extra- abdominal injuries, type of wound closure, septic complications related to colonic injury.

The duration of hospital stays (in days) was taken as the total number of nights spent in the hospital. For diagnosis of cases we depend on clinical examination, plain X-ray of abdomen and chest, and sometimes ultrasound while other diagnostic aids were not used in patients' assessment. Follow up of the patients after removal of stitches, for 20 days and so, long term follows up were not included, because the study was completed in two years. The limited use of investigations specially imaging techniques was mostly due to non-availability, rather than failure to appreciate their importance in the decision making.

RESULTS

Nine patients (12%) were females and 66 patients (88%) were males. Of the total 75 patients, 35 (47%) patients had shell injury, 29 (39%) had bullet injury, 6 (8%) had stab wound, 3 (4%) had blunt trauma, and 2 (2%) had iatrogenic injury.

Table 1: Characteristics of the sample.

Age	No.	%
< 10	6	7.5%
10-20	5	7.5%
20-30	34	45%
30-40	15	20%
40-50	11	15%
> 50	4	5%
Sex		
Male	66	87.5%
Female	9	12.5%

Twenty eight of 75 patients (37.5%) undergo primary repair, this include simple repair or repair and primary anastomosis. Another 19 of 75 patients (25%) undergo repair with proximal diversion colostomy. right hemicolectomy was done among 8 of 75 patients (10%). While 9 of 75 patients (12.5%) undergo Hartmann's procedure, and11 of 75 patients (15%) undergo exteriorization of the injured part as colostomy (Table 2).

Table 2: Modes of colonic injury management.

	No.	%
Primary repair	28	37.5%
Repair and proximal colostomy	19	25%
Hemicolectomy	8	10%
Hartmann's procedure	9	12.5%
Exteriozation of the injured part as colostomy	11	15%

Table 3 depicts the proportion of each site of injury. It was shown that majority of injuries were in the ascending, transverse and sigmoid colon for those treated

with primary repair while ascending, transverse and descending colon were more in another repair group.

Table 3: Site of colonic injury by type of repair.

Site	Primary repair group		Other groups	
	No.	%	No.	%
Ascending	3	10	4	8
Hepatic flexure	4	13.3	2	4
Transverse	8	26.54	12	24
Splenic flexure	-	-	2	4
Descending	2	6.66	9	20
Sigmoid	10	40	3	6
Cecum	1	3.5	2	4
Rectal	-	-	-	-
Two sites	-	-	13	30
Total	28	100	47	100

Table 4 shows type of management by mechanism of injury. Among cases of shell injury, 13 of 35 patients (38%) had primary repair. And 22 (62%) had other modality of management. In case of bullet injury: 9 of 29 patients (31%) had primary repair, and 20 (69%) had other groups. In case of stab wound: 4 of 6 patients (66.6%) had primary repair, and 2 (33.3%) had other groups. In case of blunt trauma: 3 of 3 patients (100%) had other group of management. And in case of iatrogenic injury: Two patients (100%) had primary repair.

Table 4: Type of management according to the mechanism of injury.

		Primary repair group		Other groups	
		No.	%	No.	%
Shell	35	13	38	22	62
Bullet	29	9	31.03	20	68.9
Stab	6	4	66.6	2	33.3
Blunt	3	-	-	3	100
Iatrogenic	2	2	100	-	-
Total	75	28	37.5	47	62.5

The mortality among cases was distributed as follow. There were 26 deaths (35%), 18 of them (71%) died in the first 24 hours, and 8 of them (29%) died after 24 hours from time of injury. 4 of the 26 deaths (15%) had primary repair, while the remaining 22 (85%) are of other groups.

DISCUSSION

The significant morbidity and financial costs associated with creation and reversal of colostomy, and the destructive effect of colostomy on the patients' quality of life have been cited as evidence to support the primary repair of colonic wounds.[24-26]

The age of the patients with colonic injury range from 7 to 68 years. Mean age of (28.4 years) and 87% of patients were males, the mean age is slightly less than other studies.[27] In present study, the commonest cause of injury was shell, 35 (47%): 13 had primary repair and 35 had other mode of treatment, this figure is much high in comparison to other studies.[28] The 2nd common cause of injury is bullet 28/75 (38%) which is low in comparison to other studies.[28] Stab wound was 6/75 (8%) which is similar to other studies.[27] The least cause is blunt trauma which is mostly due to road traffic accident which is similar to other studies.

Usually the correct diagnosis of colonic injury is made at laparotomy performed for suspected intra-abdominal injury and indication for exploration is clear with bullet and stab, and slightly difficult for shell injury, but it is more difficult in blunt trauma because of associated multiple injuries. For our patients we depend on close and thorough clinical assessment and use of para-clinical parameters for diagnosis such as abdominal and chest X-ray, peritoneal tapping, and sometimes FAST. The commonest site of colonic injury were transverse and sigmoid colon (44%) and the least is splenic flexure (4%), this figure is different from other studies.[28] In our study the commonest extra-abdominal injury is head and neck, and lower limbs, while in other studies, the commonest is the thorax. In this study, as in other studies, no isolated traumatic colonic injury, so that thorough exploration of the abdominal cavity is important for the diagnosis of the associated injuries. The commonest intra-abdominal injury is the small bowel and mesentery (40%), followed by liver, spleen and retroperitoneum in this study.

More than half of our patients with shell injury had shock, and about half of our patients with bullet injury had shock, and all with blunt trauma had shock, but no one with stab wound presented to the emergency unit with shock, this is not significantly different from other studies.[29]

Gross faecal contamination is the strongest contraindication for primary repair.[30] Peritoneal contamination is described as severe, if faecal material is seen freely in the peritoneal cavity, it is seen in 40 patients, this is not significantly different from other studies.[31] In our patients with shell injury, only 13 had primary repair, and with bullet injury, only 9, while, in stab wound 4 out of 6 had primary repair, the selection of these patients was guided by the above factors. Although some thought that primary repair should be limited to the right sided injury, with its lower bacterial counts and more liquid content than that of the left side, our conclusions and those of others did not coincide with those restrictions. Prophylactic antibiotics are essential to cover gram -ve, gram +ve, and anaerobic microorganisms in the management of large bowel injury in general, and it is vital in colonic primary repair. Ogilvie et al, reported through the 1940s that mortality and morbidity from colonic injury could be reduced several folds if the

principle of faecal stream diversion was applied.[32]

The overall mortality was 26/75 (34.6%), this figure is somewhat high when compared with other studies.[27] Most of deaths occurred in the 1st 24 hours 18/26 (71%) which is mainly due to injury to vital organs and the majority of them represent a challenge to surgeon to deal with it. Seventeen deaths (64.2%) were due to primary irreversible shock, 2 deaths (7%) due to associated thoracic injury. Eight deaths (29%) occurred after 24 hours and all of them were due to septic complications. In regard to overall mortality, four deaths were in the primary repair group, and twenty-two deaths in the other groups.

CONCLUSION

Primary repair is the main approach in colonic repair. In the absence of shock, associated injuries, or gross faecal soiling, primary repair may be considered. Mortality is considered high and need to be investigated in future research.

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