

“Clinical Abdominal Scoring System”: Role of Clinical Judgement in Patients of Solid Organ Injury in Blunt Abdominal Trauma in Age of Emerging Technology

Dr.Divyang Dave¹, Dr.Nipun Bansal², Dr.Hardik Astik³

¹(Additional Professor, Department of General Surgery, Govt. Medical College & New Civil Hospital, Surat, India)

²(Resident, Department of General Surgery, Govt. Medical College & New Civil Hospital, Surat, India)

³(Assistant Professor, Department of General Surgery, Govt. Medical College & New Civil Hospital, Surat, India)

Corresponding Author:Dr.Nipun Bansal

Abstract:

Introduction: Abdominal trauma accounts for a large number of deaths around the world. The rapid growth of automobile industry and increase in crime has caused rapid increase in number of victims of blunt abdominal trauma. Management of blunt abdominal trauma depends on carefully judging patients for whom laparotomy might be necessary.

Methods: This Observational study was a prospective study of 30 cases of blunt abdominal injuries during the period from May 2017 to August 2018 in New Civil Hospital attached to Government Medical College, Surat. Objective: To observe the outcome of the patients in view of need for laparotomy and to assess the solid organ injuries through CASS-Clinical Abdominal Scoring System.

Conclusion: This observational study concludes that patients with low CASS score can be managed conservatively. Patients with High CASS score are associated with High Mortality. This scoring system may prove helpful in quick diagnosis and treatment of patients and reducing unnecessary expenses in setting of hospitals serving the poor population.

Keywords: Abdominal trauma, ambulance, CASS, laparotomy, Time of presentation

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I. Introduction

Trauma is among the major causes of death around the world, especially in the younger group of population. Abdominal trauma holds the third rank in prevalence after head and chest traumas, with majority of cases being Blunt Abdominal Trauma.^{1,2}

The main causes of blunt abdominal trauma are Road Traffic accidents (collisions), fall from bikes, fall from heights, assault with blunt objects, sport injuries, industrial accidents, rail accidents etc. In spite of the advancement in diagnostic and supportive care, the morbidity and mortality remain at large. The reason for this could be due to the interval between trauma and hospitalization (especially in the developing countries where ambulance services are not sufficient and road discipline is not upto the mark), delay in diagnosis, inadequate surgical treatment and associated trauma especially to head, chest & extremities.

Blunt abdominal trauma may be missed if not carefully looked for. In the presence of altered mental status from associated head trauma, abdominal injury may be under-estimated or not detected at all; resulting in otherwise preventable mortality.

This may pose a significant diagnostic challenge to the surgeon. A carefully and timely performed physical examination remains the most important method to determine the need for exploratory laparotomy.

Diagnostic modalities in the form of abdominal ultrasonography (US), computed tomography (CT) scanning and laparoscopy may provide valuable assistance in making a diagnosis, but they can only supplement the clinical evaluation and cannot replace it in the diagnosis of blunt abdominal trauma.⁹ There is no substitute for proper clinical judgement.

As Surat is one of the fastest developing cities of India in terms of rapid Industrialization and Urbanization, there has been significant increase in number of road traffic accidents and incidents of assault due to increase in crime rate. So, this study was chosen to study the cases of blunt abdominal trauma with reference to the patients presenting at New Civil Hospital, attached to Government Medical College, Surat. The present

study is an endeavour to observe the outcome of the patients in view of need for laparotomy and to assess the solid organ injuries through CASS.

II. Materials and Methods

This observational study is a prospective study of 30 patients of Solid Organ Injury in blunt abdominal Trauma during the period from May 2017 to August 2018 in New Civil Hospital & Government Medical College, Surat. This study was approved by Ethics Committee of GMC & New Civil Hospital Surat on 05 May 2017.

The study was carried out on patients coming to emergency room and then admitted to surgery wards after initial resuscitation.

Data was collected from the patients by their history&clinical examination in the Emergency Room after initial resuscitation & achievement of hemodynamic stability and then the outcome of those patients was observed.

Documentation included identification, nature & time of accident, history, time of presentation after trauma, vitals, clinical findings, GCS,operative findings, any complications during hospital stay were all observed &recorded.

Inclusion criteria:

- a) Age: 18- 55 years
- b) Blunt abdominal trauma with or without Head Injury

Exclusion criteria:

- a) Paediatric-Adolescent age group (<18 Years)
- b) Elderly Patients (>55 Years)
- c) Chest trauma, Injuries to extremities & Spine injury

Clinical Abdominal Scoring System (CASS) included five parameters: first, the time of arrival, in which a high score of 3 is given to cases presenting after 6 hours, which is enough time for evolution of the consequences of internal haemorrhage if present. Second, the pulse rate, which was given a high score of 3 when it exceeded 110 beats/min denoting hypovolemia. The same principle applied to the third parameter, which included the systolic blood pressure, in which a high score of 3 was given to cases presented with a systolic pressure lower than 90 mmHg. The fourth parameter included the Glasgow coma scale (GCS), which was given a high score of 3 when GCS below 9 in order to compensate for the altered response to the abdominal examination, which is the fifth parameter included in the score.

The outcome of patients with blunt abdominal trauma was observed and it was correlated with the CASS Scores.

Table 1: Parameters of CASS and the allotted score

PARAMETER	SCORE
Time of presentation after trauma	
Less than 2 hours	1
2-6 hours	2
More than 6 hours	3
Pulse rate	
Less than 90 beats/min	1
90-110 beats/min	2
More than 110 beats/min	3
Systolic blood pressure	
Above 120 mm Hg	1
90-120 mm Hg	2
Below 90 mmHg	3
Glasgow Coma scale (GCS)	
13-15	1
9-12	2
Less than 9	3
Abdominal clinical findings	

Abdominal pain	1
Tenderness	2
Guarding, Rigidity	3

III. Observation and Discussion

Total no. of patients studied were 30. In the present series of study, 30 patients were divided into 4 age groups. Maximum no. of patients (36.67%) fell in 18-25 years age group.

In the 30 cases studied, 27 cases were males, with females accounting for only about 3 cases. Incidence of Blunt abdominal Trauma in males is much more than those in females, as, in India males are the chief bread earner for family and are more involved in outdoor activities.

The road traffic accident is the most common mode of injury. It was responsible for 60% of blunt abdominal trauma cases. This is due to the rapid development in automobile industry where the first priority has been given to speed rather than safety. Fall from heights accounted for 23% of cases and assault was responsible for 6.67% of injuries.

Considering our important parameter i.e. Time of presentation after Trauma, it was found that majority of patients (43.3%) presented within 2 hours. This is due to the improved and quick Emergency Ambulance Services available in Surat city & South Gujarat. 40% of patients presented after 6 hours of injury. This time lag is due to the site of accidents, which are usually rural, and the time taken to transport them to the hospital and is very crucial in management.

12 patients out of 30 were found to have head injuries. Out of 12 patients associated with Head Injuries, 2 patients had GCS 14/15, another patient was brought with GCS E₄V₂M₅ (11/15) while rest of the patients were having GCS scale 15/15.

In the Mode of Presentation, 4 patients had abdominal pain only, 11 patients had guarding or rigidity while rest of the patients had abdominal tenderness.

The signs & symptoms in abdominal injuries are notoriously unreliable and are often masked by concomitant head injuries. Significant injuries to the retroperitoneal structures may not manifest signs and symptoms immediately predisposing the patients to grave consequences of missed injuries. This emphasizes the importance of continuing observation and repeated careful examination of individuals with blunt abdominal trauma.

Vitals of Patients measured in Emergency room have been depicted in the Table 2.

Table 2: Vitals of patients studied in Emergency Room

Vitals		Number of patients
Pulse	Less than 90 beats/min	10
	90-110 beats/min	16
	More than 110 beats/min (Tachycardia)	4
Systolic Blood Pressure	Above 120 mm Hg	6
	90 – 120 mm Hg	22
	Less than 90 mm Hg	2

In the study, Spleen was the most common organ to be injured in blunt abdominal trauma. 11 patients had splenic involvement, 10 had liver involvement, 4 had renal involvement and 3 had pancreatic involvement. 2 patients had combined injuries. These injuries were evident on basis of USG Abdomen-pelvis or CECT. On observation, Patients with High CASS score 12 or more than 12 were only 3 in number, out of which 2 were managed conservatively. But both of them expired. The operated patient survived and was discharged.

Table 3: Comparison of CASS Scores with previous studies.

CASS Score	No. of patients	Conservative	Operative	Expired	T Vanitha, Madurai ⁴	PeymanErfantal ab-Avini, Tehran ¹
12- 15	3 (10%)	2	1	2	20%	4.25%
9- 11	13 (43.3%)	13	0	1	20%	32.75%
8 or below	14 (46.7%)	14	0	0	60%	63%

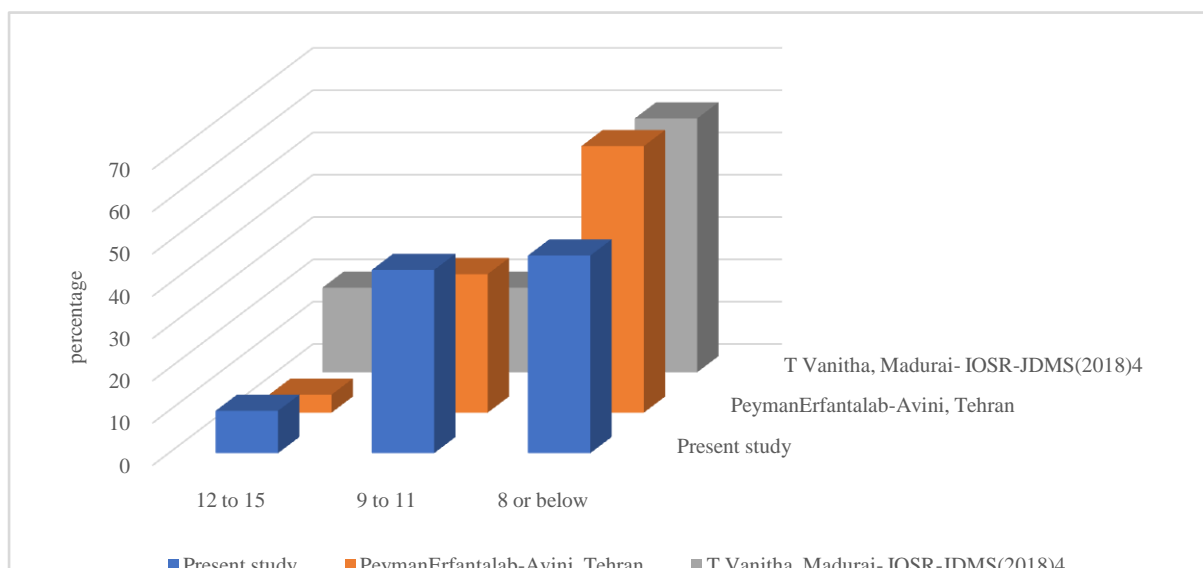


Figure 1: Comparison of CASS scores in our study with previous studies.

29 patients (96.67%) were treated with conservative management while 1 patient (3.33%) was operated. It also shows that there is an increasing trend towards conservative management.

Table 4: Comparison of number of patients treated conservatively with the previous studies.

Management	No. of patients in this study	Percentage	T Vanitha, Madurai- IOSR-JDMS (2018) ⁴	Amuthan et al ⁹
Conservative	29	96.67%	63%	52%
Operative	1	3.33%	37%	48%

Out of 29 patients who were managed conservatively, 3 got expired and only 1 patient with High CASS Score was operated. He survived.

Table 5: Comparison of outcome with previous study

		No. of patients	Percentage	Amuthan et al ⁹
Outcome of Conservative Management	Success	26	89.7%	24
	Expired	3	10.3%	0
Outcome of Operative Management	Success	1	100%	20
	Expired	0	0 %	2

Table- 6: Comparison of overall success and failure rate

	No. of patients	Present study	Amuthan et al ⁹
Overall Success	27	90%	95.66%
Overall Failure	3	10%	4.34%

IV. Conclusion

From this study, the following conclusions can be made. Young Males are predominantly affected (90%). Road traffic accident forms the most common mode of injury (60%). Hence measures should be taken to prevent these accidents. Well established trauma care centres with disciplined ambulance services should be established, thereby reducing the time of Presentation. EMT and paramedical personnel should be trained for Basic life support so as to reduce the mortality.

A thorough clinical examination on admission can lead to successful decision making in these patients and then regular follow-up examinations should be done.

Our limited experience showed that Clinical Abdominal scoring system based on clinical manifestation and examination may decrease unnecessary CT scans, save time, and reduce healthcare cost especially in developing countries like India. CASS is a good scoring system in rapid detection of the need for laparotomy

Conservative management is gaining increased acceptance and is successful in carefully selected patients. Conservative line of management is safe and effective in a hemodynamically stable patient without any signs of peritonitis.

The most common injured organ in the present study is spleen (36.7%) & most of them were managed by conservative management. Liver injury is the second most commonly injured organ (33.3%). Associated head & neck injuries were found in 12 cases.

The only 1 patient operated for Exploratory Laparotomy belonged to category with High CASS Score. Patients with High CASS Score but managed conservatively had Higher Mortality Rate. So, it was high risk category. Patient with High CASS Score and operated had better survival rate than those whose were managed conservatively at High CASS Score.

Patients with low CASS Score are associated with no need of laparotomy.

The present study showed an overall mortality of 10%. However, the present observational study had only 30 cases. It requires a major study on larger scale to further support and affirm the results.

References

- [1]. Peyman Erfantalab-Avini, Nima Hafezi-Nejad, Mojtaba Chardoli* and Vafa Rahimi-Movaghar, Evaluating clinical abdominal scoring system in predicting the necessity of laparotomy in blunt abdominal trauma, Chinese Journal of Traumatology 2011; 14(3), 156-160.
- [2]. Raafat Y. Affi, Blunt Abdominal Trauma : Back to Clinical Judgement in the era of Modern Technology, International Journal of Surgery (London, England), (2008) 6, 91-95
- [3]. Van der Vlies et al, Changing patterns in diagnostic strategies and the treatment of blunt injury to solid abdominal organs, International Journal of Emergency Medicine 2011 4, 47.
- [4]. Dr. T. Vanitha, Prospective Study Comparing The Clinical Abdominal Scoring System (Cass) With Blunt Abdominal Trauma Severity Scoring (Batss) In Predicting The Necessity of Laparotomy. IOSR Journal of Dental and Medical Sciences (IOSR-JDMS) Volume 17, Issue 3 Ver.16 March. (2018), PP 25-33
- [5]. L.D. Britt, Robert A. Maxwell, Management of Abdominal Trauma; in Maingot's Abdominal Operations. 12th edition (2013). P247-253.
- [6]. Mohsin Raza et al, Non-Operative Management of abdominal trauma- a 10 years review - World Journal of Emergency Surgery 2013, 8:14
- [7]. George A Giannopoulos et al, Non operative management of blunt abdominal trauma. Is it safe and feasible in a district general hospital? Scandinavian Journal of Trauma, Resuscitation Emergency Medicine, 2009, 17:22: <http://www.sjtem.com/content/17/1/22>.
- [8]. George C. Velmahos; Konstantinos G. Toutouzas, Randall Radin, Linda Chan, Demetrios Demetriades, Non-Operative Treatment of Blunt Injury to Solid Abdominal Organs; A Prospective Study, Arch Surg/ Vol138, Aug 2003 p844-851.
- [9]. J Amuthan, A Vijay, C Pradeep, Heber Anandan, A Clinical Study of Blunt Injury Abdomen in a Tertiary Care Hospital Tamil Nadu - International Journal of Scientific Study, April 2017, Vol 5, Issue 1.

Dr. Divyang Dave. “Clinical Abdominal Scoring System”: Role of Clinical Judgement in Patients of Solid Organ Injury in Blunt Abdominal Trauma in Age of Emerging Technology.” IOSR Journal of Dental and Medical Sciences (IOSR-JDMS), vol. 18, no. 4, 2019, pp 10-14.