Original Article

A study of accuracy of diagnostic laparoscopy in blunt abdominal trauma patients

Utkarsh Ghavghave[1], Meghraj J Chawada[2*]

[1]Senior Resident, Department of Surgery, Government Medical College, Nagpur, Maharashtra, INDIA.
[2]Assistant Professor, Department of Surgery, Government Medical College, Latur, Maharashtra, INDIA.
Email: dr.meghrajchawada244@gmail.com, utkarshv.ghavghave@gmail.com

Abstract

Introduction: Incidence of blunt trauma to abdomen is increasing day due to increase in incidence of Road Traffic Accident. Various diagnostic tests can be used to evaluate patients with blunt abdominal trauma. These include ultrasonography (US), diagnostic peritoneal lavage (DPL), computed tomography (CT) and diagnostic laparoscopy (DL). Laparoscopy has gained widespread acceptance as a useful tool in the diagnosis and management of patients with blunt abdominal injuries. **Aims and objective:** To study the accuracy of Diagnostic Laparoscopy in Blunt Abdominal Trauma Patients **Materials and Method:** Total 40 cases of blunt abdominal trauma were enrolled in the present study. Diagnostic laproscopic was performed in all the patients using standard guidelines. Hemodynamic parameters were watched meticulously during the procedure. Postoperatively, the patients were observed for vital parameters, hemoglobin level and return of bowel functions and wound complications. The patients were discharged after return of normal bowel functions, drain removal and ruling out complications if any. Information regarding mean duration of surgery, blood transfusion required, post operative nbm, drain in situ, hospital stay and stitch removal was also recorded. The collected data was analyzed and presented with appropriate table and graphs. **Results:** The most common mode of injury in the present study was road traffic injury (60%) followed by fall (15%) and assault (20%). It was seen that majority of the patients (75%) were less than 40 years of age. Majority of the patients were male (80%). It was observed that out of total 40 patients explorative laprotomy was required in 10 cases. There was no negative laproscopy done in the present study. Thus the accuracy diagnostic laproscopy was 100% in the present study. **Conclusion:** Thus we conclude that laparoscopy is newly emerging diagnostic as well as therapeutic modality in management of blunt abdomianal injury which is getting acceptance worldwide, subjective to availability of equipment and skilled item. The accuracy of diagnostic laproscopy was 100% in the present study.

Keyword: diagnostic laproscopy, accuracy, blunt abdominal trauma.

[*]**Address for Correspondence:**
Dr. Meghraj J Chawada, Assistant Professor, Department of Surgery, Government Medical College, Latur, Maharashtra, INDIA.
Email: dr.meghrajchawada244@gmail.com
Received Date: 04/11/2015 Revised Date: 12/12/2015 Accepted Date: 16/01/2016

Access this article online	
Quick Response Code:	Website: www.statperson.com
	DOI: 20 January 2016

INTRODUCTION

Incidence of blunt trauma to abdomen is increasing day due to increase in incidence of Road Traffic Accident. Various diagnostic tests can be used to evaluate patients with blunt abdominal trauma. These include ultrasonography (US), diagnostic peritoneal lavage (DPL), computed tomography (CT) and diagnostic laparoscopy (DL). Laparoscopy has gained widespread acceptance as a useful tool in the diagnosis and management of patients with blunt abdominal injuries.[1] It was first used for a trauma patient in 1956 by Lamy, who observed two cases of splenic injury and later, it was noted that laparoscopy is useful for determining the need for laparotomy.[2] In 1991, Berci *et al* reported that he had reduced the number of non-therapeutic laparotomies performed for hemoperitoneum by 25% by laparoscopy in patients with blunt abdominal trauma.[3] Laparoscopic evaluation of the abdominal cavity has been established as sensitive and specific in the trauma setting (sensitivity 94% and specificity 98%).[4] The inspection of the abdominal cavity and solid viscera is relatively easy to perform, but the complete examination of the intestine

How to site this article: Utkarsh Ghavghave, Meghraj J Chawada. A study of accuracy of diagnostic laparoscopy in blunt abdominal trauma patients. *MedPulse – International Medical Journal* January 2016; 3(1): 60-63. http://www.medpulse.in (accessed 22 January 2016).

presents a greater challenge, with a 9-18% missed injury rate per patient.[5] A diagnostic laparoscopy with therapeutic option should only be attempted in stable patients.[6] Three trocars are usually used and the abdomen is expired systematically, beginning with the right upper quadrant and continuing clockwise. Hollow viscus injuries and injuries to the diaphragm and mesentery can be detected and sutured laparoscopically. Injuries to parenchymal approach They usually no longer bleed in stable patient and can be sealed with tissue adhesive and collagen tamponade to prevent re-bleeding. The routine use of laparoscopy can achieve a sensitivity of 90-100% in abdominal trauma. This can reduce the number of unnecessary laparotomies and the related morbidity.[7]

MATERIALS AND METHOD

The present study was conducted after receiving the permission from institutional ethical committee. Total 40 cases of blunt abdominal trauma were enrolled in the present study with reference to below mentioned inclusion and exclusion criteria.

Inclusion Criteria

- Patients with blunt abdominal trauma who sustained Hemoperitoneum or Pneuperitoneum and who are positive for Diagnostic peritoneal lavage, FAST or USG studies with relatively stable hemodynamics (Systolic BP > 90 mmHg and urine output > 15 ml/hr)
- Patients of age group between 20 years and 65 years of either sex having

Exclusion Criteria

- Hemodynamically unstable patients eg. Systolic BP < 90 mm of Hg and urine output <15 ml/hr.
- A clear indication for immediate celiotomy such as frank peritonitis, hemorrhagic shock, evisceration etc.
- Patients with an uncorrectable coagulopathy or uncorrectable hypercapnia.
- History of multiple previous abdominal surgeries.
- Associated severe head injuries like Extra Dual Hematoma pr Sub Dural Hematoma, compound fracture, spine fracture, severe chest trauma with low Sp02 (< 90 %), late pregnancy.
- Patients of blunt abdomen trauma with stable parameters and normal imaging findings.
- Immunocompromised patients.

Informed written consent was obtained from all the enrolled patients. Basic demographic information of all the patients was entered in the prestructured proforma. Detail clinical examination was done in all the patients. Necessary laboratory investigations were done as per requirement and the findings were entered in the proforma. Diagnostic laproscopic was performed in all the patients using standard guidelines. Hemodynamic parameters were watched meticulously during the procedure. Postoperatively, the patients were observed for vital parameters, hemoglobin level and return of bowel functions and wound complications. The patients who underwent spleenectomy were given vaccination against meaningful, pneumococcal, and H. influenza type B infections. The patients were discharged after return of normal bowel functions, drain removal and ruling out complications if any. Information regarding mean duration of surgery, blood transfusion required, post operative nbm, drain in situ, hospital stay and stitch removal was also recorded. The collected data was analyzed and presented with appropriate table and graphs.

RESULTS

Table 1: Distribution of patients according to demographic parameters

Variable		No. of patients	Percentage
Mode of injury	RTA	24	60
	Fall	6	15
	Assault	8	20
	Other	2	5
Age	20-30	18	45
	31-40	12	30
	41-50	6	15
	51-60	2	5
	>60	2	5
Sex	Male	32	80
	Female	8	20

The most common mode of injury in the present study was road traffic injury (60%) followed by fall (15%) and assault (20%). It was seen that majority of the patients (75%) were less than 40 years of age. Majority of the patients were male (80%).

Table 2: Distribution according to incidence of negative laprotomy and accuracy of laproscopy

Variable	No of patients	%
Laparoscopy	30	75
Laparotomy	10	25
No. of Negative laperotomies	0	0
Accuracy diagnostic laproscopy	40	100

It was observed that out of total 40 patients explorative laprotomy was required in 10 cases. There was no negative laproscopy done in the present study. Thus the accuracy diagnostic laproscopy was 100% in the present study.

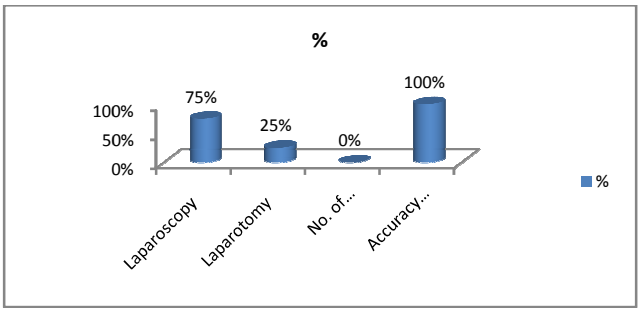

Table 3: Distribution according to various post operative parameters

Mean duration of parameter	No. of patients
Duration of surgery	45 min
Blood transfusion required	2 unit
Post operative NBM	1.5 days
Drain in situ	5 days
Hospital stay	7 days
Stitch removal	7 days

It was observed that the mean distortion of surgery was 45min. Average amount of blood required in present study was 2 unit (1 unit=350 cc) of whole blood. The mean duration of NBM postoperatively was 1.5 days. In majority of the patients the drain was removed on 5th day. The mean duration of hospital stay was 7 days. In majority of the patients the stitches were removed on 7th day.

DISCUSSION

In present study we studied the 40 cases of blunt abdominal trauma undergoing diagnostic laproscopy. It was seen that the road traffic accidents (60%) was the most common mechanism of blunt abdominal trauma. It was followed by assault (20%), fall from heights (15%) and others (5%). Increased transportation and mobilization of people mainly through the vehicles was the most common reason which makes individual susceptible to road traffic accident. Jason Smith *et al*[8] also observed road traffic accidents as most common mechanism of Blunt abdominal trauma. It was observed that the maximum incidence of blunt trauma to abdomen was in the young age group. The higher incidence in young age group is mainly because of high mobility and increased in utilization of vehicles by this young age groups and exposure to bad environment and alcohol abuse etc particularly in India. Similar findings were also observed by Timothy-C Fabian *et al*[10] and YB Chol *et al*[6] in their series. The incidence of blunt trauma to abdomen was observed more in males with ratio of Male: Female as 4:1. This is due to involvement of male in travelling, drug abuse and earnings. Similar findings were also observed by Timothy-C Fabian *et al*[10] and YB Chol *et al*[6].

It was observed that out of total 40 patients explorative laprotomy was required in 10 cases. There was no negative laproscopy done in the present study. Similar findings were also observed by Mayer *et al*[10] in their study. In contrary Caschieri *et al*[11] and Townsend at al[12] observed 10% and 7% incidence of negative laprotomy in their studies respectively. The accuracy diagnostic laproscopy was 100% in the present study. Gustavo Kuster *et al*[13] and Hamish Foster[14] observed 98% and 89% accuracy of diagnostic laproscopy in their study. In present study we had used 3-4 ports. Most commonly 3 in number out of which 1 is of 10 mm at umbilicus which is common in all cases. 2 are of 5 mm placed according to findings on scope and region of injury. 4th tracer usually needed in complex injuries to left lobe of liver, posterior pole of spleen or for diaphragmatic or stomach injuries to better visualization. It is usually taken in subxiphoid /eipgastric region. In YB Chol *et al*[6] series, the numbers of port used were three: 1 umbilical port (10 mm), right and left port-5 mm, 10 mm and 12mm. In the present it was observed that the mean distortion of surgery was 45min. Thus the average duration of surgery this was quite less than for standard laparotomy (which requires at least 1hour). Hence patient had less surgical stress and less post aesthetic complication. In YB Chol *et al*[6] series average duration of surgery was 42 minute which was comparable with the present study. Average amount of blood required in present study was 2 unit (1 unit=350 cc) of whole blood. It was seen that most of the patients were kept NBM for only one day and started liquids on 2nd post-operative day. 12patients kept NBM for more than two (5 for 3rd POD and 6 for 4th POD and 1 for 5th post-operative day). The mean duration of NBM postoperatively was 1.5 days. Almost 80% of patients were made mobile on 3rd POD with or without drain in situ which helpful in early recovery. This is the main advantage of patients treated laparoscopically. In study by Pascal Fabian *et al*[15] 19 patients made mobile on average 4th POD. In majority of the patients the drain was removed on 5th day. The mean duration of hospital stay was 7 days. In majority of the patients the stitches were removed on 7th day. YB Chol *et al*[6] mentioned mean

hospital stay was 9.8 days while Pascal-Fabian *et al*[15] has mentioned 4 days of hospital stay in their study. Apparently there was no any complication found related to laparoscopic procedure in present series. There was a one patient having persistent low SPO2 level even with continuous O2 inhalation (6 to 8 lit. per minute). This was post aesthetic complication hence not calculated in presence study. In YB Chol *et al*[6] series the complication had occurred only in three cases (would infection -1, Paralytic ileums -1, Atelectsis -1). In present study there was no morbidity observed. These findings were comparable with the study done by YB Chol *et al*[6] and Timothy C Fabian *et al*[9]. Thus laparoscopy is quite safe and effective method. The role of aparoscopy in diagnosis and management of blunt abdominal trauma is a topic of much debate in this present series we have reported 40 cases of blunt abdominal trauma in which laparoscopy was used as a diagnostic and therapeutic tool in the management of blunt abdominal injury with hemoperitoneum. Though in patients with spleen or liver injury, we have city scan or USG report, we are more comfortable only after seeing the organ injury by laparoscopy and knowing the amount of hemoperitoneum. The other main advantage of laparoscopy is that it significantly reduced the hospital stay. Patients with laparoscopy have very small incision with less surgical manipulation with early mobilization from very 3rd day in our study. This allows the patients with to send home early as compared to patients who had undergone laparotomy, Hence it is helpful in terms cost effectiveness and early resumption of work. Laparoscopy provide patient an early mobilization, early oral intake. Hence patient had good nutrition with less chances of complication to develop because of prolonged bedridden condition in patients of laparotomy that need at least 5 days NBM and bed rest to recover from stress of abdominal open surgery. With the improvement of laparoscopic techniques and instrumentation more blunt injuries can probably be managed laparoscopicaly with the from open to laparoscopic, and it is likely that laparoscopy will finds its place as an integral part of evaluating and treating patients with blunt abdominal injury.

CONCLUSION

Thus we conclude that laparoscopy is newly emerging diagnostic as well as therapeutic modality in management of blunt abdomianal injury which is getting acceptance worldwide, subjective to availability of equipment and skilled item. The accuracy of diagnostic laproscopy was 100% in the present study.

REFERENCES

1. Bender JS, Talamini MA. Diagnostic laparoscopy in critically ill intensive care patients. Surg Endosc 1992; 6:302-4.
2. Gazzaniga AB, Slanton WW, Bartlett RH. Laparoscopy in the diagnosis of blunt and penetrating injuries to abdomen. Am J Surg 1996; 131:315-8.
3. Berci G, Sackier JM, Paz-Parlow M. Emergencey laparoscopy. Am J Surg 1991; 161:332-5
4. Renz BM, Feliciano DV. The length of hospital stay after an unnecessary laparotomy for trauma: a prospective study. J Trauma 1996; 40:187-190.
5. Mazuski JE, Shapiro MJ, Kaminski DL. Diagnostic laparoscopy for evaluation of penetrating abdominal trauma. J Trauma 1997; 42:163.
6. Chol YB and Lim KS (2003): Therapeutic laparoscopy for abdominal trauma. Surg Endosc ; 17: 421-7.
7. Gorecki PJ Cottam D, Angus LD and Shaftan GW (2002): Diagnostic and therapeutic laparoscopy for trauma: a technique of safe and systematic exploration. Surg Laparosc Endosc Percutan Tech; 12:195-8.
8. Jason Smith, *et al*. Laparoscopy in pediatric Blunt Trauma Abdomen. A case report, surg.l endosc 2002;16:358-63
9. Timothy C, Fabian, *et al*: A prospective analysis of laparoscopy in trauma. Annals of surgery 217(5):557-65.
10. Meyer Richard A, crass Robert C, lim Jr R, Brooke Jeffrey Michael P, Federle Donald D, trunkey. New concepts in abdominal trauma Arch surg 1985; 120 (5): 550-54.
11. A Cuschieri, TP Hennessy, RB Stephens, G Berci. Diagnosis of significant abdominal trauma after road traffic accidents: preliminary results of a multicentre clinical trial comparing minilaparoscopy with peritoneal lavage. Ann R Coll Surg Engl May 1988; 70(3):153-55
12. Townsend MC, Flancbaum L, Choban PS, Cloutier CT. Diagnostic laparoscopy as an adjunct to selective conservative management of solid organ injuries after blunt abdominal trauma. J Trauma 1993; 35:647-51
13. Kuster, Gustavo, Fructuoso Biel. Accuracy of laparoscopic diagnosis. The American Journal of Medicine. 1967; 42(3): 388 – 393
14. Hamish Foster; Waters, David chM, Laparoscopy… A useful technique for the general surgeon 58(1):47-50.
15. Pascal Fabiani, *et al* j. of lap endosc and adv surge tech oct 2002; 13(5): 309-12.

Source of Support: None Declared
Conflict of Interest: None Declared