10.5005/jp-journals-10033-1306

REVIEW ARTICLE

# Laparoscopy in Blunt Abdominal Trauma

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## ABSTRACT

**Introduction:** This review describes the role of laparoscopy in patients with blunt abdominal trauma.

**Materials and methods:** Keywords, such as laparoscopy, blunt, abdominal, trauma were entered into PubMed search engine and filtered for peer-reviewed articles written in the last 5 years.

**Results and discussion:** The findings from these articles are collated and discussed.

**Conclusion:** Laparoscopy is a safe approach both for diagnosis and treatment of patients with blunt abdominal trauma and is associated with the benefits of laparoscopic approach.



**Keywords:** Blunt abdominal trauma, Diagnostic laparoscopy, Missed visceral injuries, Therapeutic laparoscopy.

**How to cite this article:** Nnamonu MI. Laparoscopy in Blunt Abdominal Trauma. World J Lap Surg 2017;10(2):66-68.

**Source of support:** Nil

**Conflict of interest:** None


## INTRODUCTION

The use of laparoscopy in trauma has lagged behind in the otherwise rapid progression of this groundbreaking surgical tool. Although reports exist of the use of laparoscopy for the diagnosis of hemoperitoneum as far back as the 1920s, there is still a paucity of literature on this subject to this day.[1,2]

There is no doubt that this is related to the nature of trauma. There is often anxiety and concern to optimize the patient with the quickest possible intervention. It should be stated early in this discourse that there is no role for laparoscopy in the management of the patient with abdominal trauma who is hemodynamically unstable. The priority in this situation follows the standard life-saving principles of resuscitation, with quick access for hemostasis, which must in those situations be open surgery. Associated extraabdominal injuries like head injuries may also be worsened by the hemodynamic effects of carbon dioxide pneumoperitoneum and may preclude laparoscopy. The gasless laparoscopy technique has been described to attenuate this as well as to prevent air embolism and also pneumothorax in patients with occult diaphragmatic injuries.[3]

Laparoscopy can be safely used when an intraabdominal injury is suspected in a patient, i.e., hemodynamically stable. These are patients with a systolic blood pressure of >100 mm Hg, diastolic blood pressure of >60 mm Hg, a heart rate of <110 beats per minute, and crystalloid resuscitation requirements of <2 L.[4]

The objective of this review is to determine the scope of the diagnostic and therapeutic uses of laparoscopy in blunt abdominal trauma, and also to delineate the benefits, complications, as well as prospects of laparoscopy in patients with blunt abdominal trauma.

## MATERIALS AND METHODS

The PubMed search engine was used to search for peer-reviewed articles. The keywords entered were laparoscopy, blunt, abdominal, and trauma. The search was filtered to include only articles written in the last 5 years. All 55 articles obtained from the database were then reviewed for relevance and sample size. Case reports were excluded.

## RESULTS

Several articles discussed the uses of laparoscopy in blunt abdominal trauma. The role of laparoscopy as the most sensitive detector of a breach of the peritoneum in penetrating abdominal trauma is immediately apparent.[5] It is instructive that the authors reviewed equally acknowledged the role of laparoscopy in diagnosis in blunt abdominal trauma. Johnson et al[5] started their study on the established premise that diagnostic laparoscopy (DL) had decreased the rate of nontherapeutic laparotomies in patients with penetrating abdominal injuries. They sort to determine whether DL similarly lowered nontherapeutic laparotomy in blunt abdominal injury. They found that coupled with diagnostic computed tomography (CT) scan, DL yielded a nontherapeutic laparotomy rate of 0% in patients with blunt abdominal trauma. They concluded that when combined with CT scan, DL is a useful tool in the initial evaluation of patients with blunt abdominal trauma. Lee et al[6] had similar findings demonstrating that the use of laparoscopy in patients with abdominal trauma safely decreased the laparotomy rate.


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Furthermore, Talutis et al[7] and Borgialli et al[8] demonstrated the value of DL in the diagnostic workup for blunt abdominal trauma in the pediatric age group. This would be of value in this age group where clinical symptoms and signs of peritonism may be equivocal. Tharakan et al[9] also found that laparoscopy reliably resolves uncertainty in hemodynamically stable pediatric patients with blunt abdominal trauma with a concerning clinical examination and inconclusive imaging. They further reported that laparoscopy provided sensitive diagnostic capability and opportunity for definitive repair with decreased surgical morbidity. Wisner et al[10] equally included laparoscopy in the evaluation protocol in their large study involving 12,044 children.

In other articles, additional benefits accruing from the use of DL in patients with blunt abdominal trauma are conclusively demonstrated. Trejo-Avila et al[11] compared outcomes following laparoscopic *vs* open surgery in patients with abdominal trauma. They came to the conclusion that laparoscopic surgery for abdominal trauma is safe and feasible in hemodynamically stable patients. Furthermore, they found that laparoscopic surgery was associated with shorter operative time, lower estimated blood loss, faster return to normal diet, and shorter hospital length of stay. Lim et al[12] had similar findings. In their series of 111 patients with abdominal trauma, 41 were explored laparoscopically and 70 by open surgery. The patients who had laparoscopic surgery had less wound infection, passed gas earlier, and had a shorter hospital stay. Operative times were similar and neither approach was complicated by missed injury or postoperative intraabdominal abscesses. Khubutiya et al[13] in a larger study involving 628 patients equally found that compared with patients who had open surgery, patients who had laparoscopic surgery had quicker recovery time, less pain, shorter hospital stay, and a lower complication rate. There were no missed abdominal organ injuries at laparoscopy.

Laparoscopy for abdominal trauma is useful in the diagnosis of diaphragmatic rupture, an often missed injury.[14,15] Lin et al[16] have described a new approach for management of high-grade splenic injury laparoscopically. They, however, emphasize the need for adequate training on laparoscopy in trauma.

## DISCUSSION

Evaluation of diagnostic tools in blunt abdominal trauma remains a contemporary issue to clarify the need for appropriate surgical intervention.[17] This study clearly describes the safety of DL as an approach in blunt abdominal trauma. With the increasing trend for limited intervention in appropriately selected hemodynamically stable patients with blunt abdominal trauma, the role of DL is brought to the fore.[18-20]

As minimal access surgery becomes more prominent, laparoscopic surgeons should equally remain aware of the potential complications that could arise when this approach is adopted in the management of patients with blunt abdominal trauma.[21]

## CONCLUSION

Laparoscopy can be safely used both diagnostically and therapeutically in hemodynamically stable patients with blunt abdominal trauma.

## ACKNOWLEDGMENT

The author would like to acknowlege Prof RK Mishra, Dr Chowhan, The Society of Laparoscopic Surgeons, Laparoscopy for Trauma, Ransom KJ, Smith RS, Staff of World Laparoscopy Hospital, Gurgaon, India, March 2017 batch of FMAS and DMAS, World Laparoscopy Hospital, Gurgaon.

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