

# Review of laparoscopy in trauma cases in a Singaporean trauma centre

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## Introduction

Laparoscopic surgery has made major advances over the past few decades and gained success in the setting of elective surgery. However, the use of laparoscopy in the trauma setting as a diagnostic and therapeutic tool is still undergoing serious debate and there is insufficient data available to date. Potential advantages of the minimally invasive approach include high diagnostic accuracy and reduced rates of negative laparotomies, improved respiratory function, reduced rates of surgical site infection, reduced post operative pain and faster recovery. We describe our experience with trauma laparoscopy cases in this poster.

## Materials and Methods

Tan Tock Seng Hospital is level one trauma centre situated in a region with high population density. A retrospective descriptive study of patients who were admitted for trauma-related injuries between the years of 2013 to 2022 and underwent trauma laparoscopy was reviewed and analyzed. Data included are demographics (age, sex, injury severity scale), mechanism of injury, indication for trauma laparoscopy, procedures performed, intra-operative findings, conversion to laparotomy and outcomes (length of hospital stay (LOS) and mortality). Given the expected heterogeneity, statistical analysis was not performed.

## Results

A total of 14 patients who underwent trauma laparoscopy were included. The median age was 27.5 years (range: 17-89). 78.6% of patients were male (n = 11/14). The median injury severity scale was 15 (range: 4-33).

Most of the injuries were penetrating in nature, which accounted for 71.4% (n = 10/14). Blunt trauma accounted for the remaining 28.6% (n = 4/14). Among the 10 patients with penetrating trauma, 9 patients sustained stab wounds and 1 patient sustained a penetrating wound from falling onto glass.

The majority of patients, 64.3% (n = 9/14) had computed tomography (CT) scan performed prior to trauma laparoscopy, while 1 patient underwent abdominopelvic ultrasound imaging as she was in the first trimester of pregnancy.



Image 1: abdominal stab wound

Indications for laparoscopy	n
Exploration of depth of penetrating wounds	5
Free fluid for evaluation with no evidence of solid organ injury	4
Pneumoperitoneum for evaluation of potential hollow viscus injury	2
Hemoperitoneum for evaluation	2
Evaluation of possible splenic laceration	2
Evaluation of possible diaphragmatic injury	2

3 patients underwent purely diagnostic laparoscopy with no therapeutic interventions performed. 4 patients received therapeutic laparoscopic interventions which included repair of diaphragmatic lacerations (n = 3/4), packing of liver laceration (n = 1/4) and hemostasis of splenic laceration (n = 1/4).

A total of 7 cases (50%) were converted to laparotomy. Indications for conversion to laparotomy included breach of penetrating wounds beyond abdominal musculature layer (n = 4), small bowel injury (n = 2), active bleeding from avulsed mesocolon (n = 1).

The median LOS was 5 days for the laparoscopy group, compared to 8 days for the laparoscopy converted to laparotomy group. There were no missed injuries or mortality.

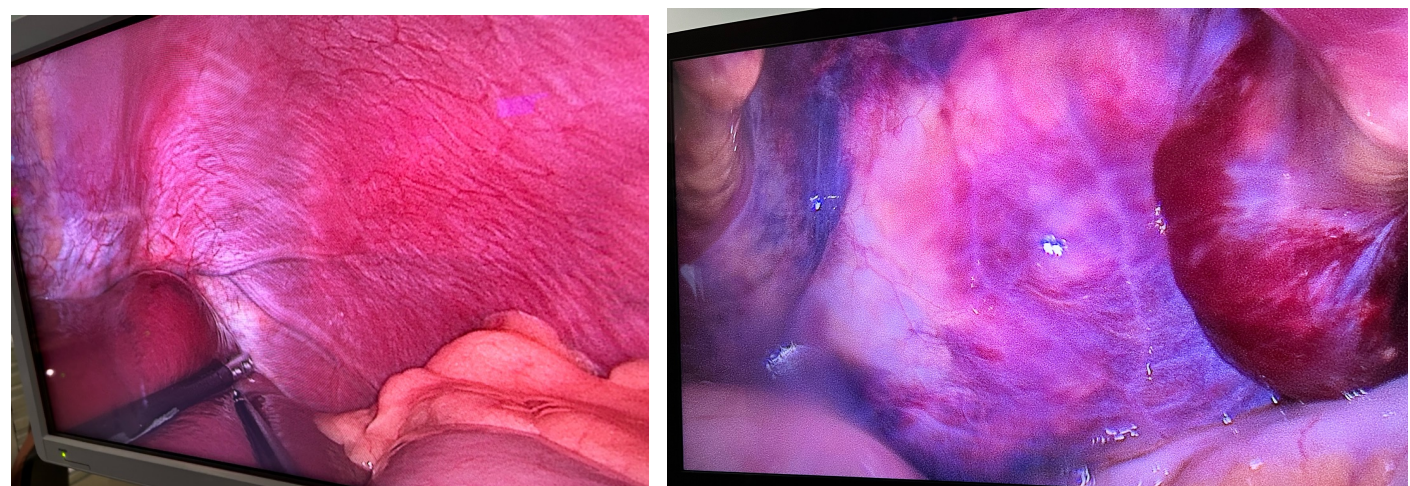


Image 2 (left): laparoscopic view of diaphragm to exclude diaphragmatic injury

Image 3 (right): pelvic hematoma, laparoscopy performed to exclude intraperitoneal bladder perforation

## Discussion

Laparoscopy in trauma has both diagnostic and therapeutic roles. CT scan may not accurately identify hollow viscus injuries compared to laparoscopy. 3 patients underwent diagnostic laparoscopy without therapeutic intervention required and there were no missed injuries. Hence, laparoscopy can reduce the number of negative laparotomies, which can reduce post operative pain and surgical wound infection rate. As our laparoscopic skills advance, we are also able to proceed with repairing injuries that are identified laparoscopically. The 4 patients who received therapeutic laparoscopic interventions recovered well. Hospital LOS was shorter in the laparoscopy group compared to the laparoscopy converted to laparotomy group.

## Conclusion

Laparoscopy has a role in carefully selected trauma patients. With increasing experience, we can expect the usage to grow which can translate into patient's benefit via reduced pain and length of hospital stay. As our experience managing trauma patients matures, we hope to develop a protocol for suitability of laparoscopy in the trauma setting to improve their outcomes.