



Research Article

A SAFE METHOD OF OPEN LAPAROSCOPY BY INTRODUCING BLUNT CANNULA INTO THE PERITONEAL CAVITY INSTEAD OF DIRECT TROCAR INSERTION INTO THE PERITONEAL CAVITY

Govindarajalu Ganesan

Dept. of General Surgery Indira Gandhi Medical College and Research Institute Puducherry- 605009

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ABSTRACT

Objective: To do a safe technique of open laparoscopy by using a blunt cannula without the sharp trocar to introduce into the peritoneal cavity instead of direct trocar insertion into the peritoneal cavity.

Methods: From 13th October 2015 to 18th December 2019 for a period of 4 years and 1 month, open laparoscopy was done by the technique of using a blunt cannula without the sharp trocar to introduce into the peritoneal cavity while doing laparoscopic operations like laparoscopic appendectomy and laparoscopic cholecystectomy instead of direct trocar insertion into the peritoneal cavity.

Results: From 13th October 2015 to 18th December 2019 for a period of 4 years and 1 month, while following the technique of open laparoscopy by using a blunt cannula without the sharp trocar to introduce into the peritoneal cavity while doing laparoscopic operations like laparoscopic appendectomy and laparoscopic cholecystectomy instead of direct trocar insertion into the peritoneal cavity, no patient had injury to the intra-abdominal organs, viscera and blood vessels.

Conclusion: Hence the technique of open laparoscopy by using a blunt cannula without the sharp trocar to introduce into the peritoneal cavity while doing laparoscopic operations instead of direct trocar insertion into the peritoneal cavity is extremely useful since it avoids the complications of injury to the intra-abdominal organs, viscera and blood vessels.

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INTRODUCTION

The technique of open laparoscopy by using a blunt cannula without the sharp trocar to introduce into the peritoneal cavity under direct vision while doing laparoscopic operations instead of direct trocar insertion into the peritoneal cavity is extremely useful since it avoids the complications of injury to the intra-abdominal organs, viscera and blood vessels.

MATERIALS AND METHODS

This study was conducted in the department of General surgery, Indira Gandhi Medical College and Research Institute, Puducherry. From 13th October 2015 to 18th December 2019 for a period of 4 years and 1 month, open laparoscopy was done by a technique of using a blunt cannula without the sharp trocar to introduce into the peritoneal cavity under direct vision while doing laparoscopic operations like laparoscopic appendectomy and laparoscopic cholecystectomy instead of direct trocar insertion into the peritoneal cavity.

RESULTS

From 13th October 2015 to 18th December 2019 for a period of 4 years and 1 month, while doing 102 laparoscopic

operations which included 42 laparoscopic appendectomies, 28 laparoscopic cholecystectomies, 18 laparoscopic hernia repair (TAPP) and 14 diagnostic laparoscopic procedures by a technique of using a blunt cannula without the sharp trocar to introduce into the peritoneal cavity under direct vision instead of direct trocar insertion into the peritoneal cavity, no patient had injury to the intra-abdominal organs, viscera and blood vessels.

DISCUSSION

Technique of our open laparoscopy

1. Umbilical stalk is given strong upward and backward traction with Allis forceps to expose the junction of the umbilical stalk with the linea alba (Fig 1).
2. The junction of the umbilical stalk with the linea alba is the thinnest part of the abdomen and at this point peritoneum is fused with linea alba as a single layer (Fig 1). The correct identification of this point is important, as a simple vertical incision starting from the junction of the umbilical stalk with the linea alba provides direct access to the peritoneum (Fig 2).

*Corresponding author: Govindarajalu Ganesan

Dept. of General Surgery Indira Gandhi Medical College and Research Institute Puducherry- 605009

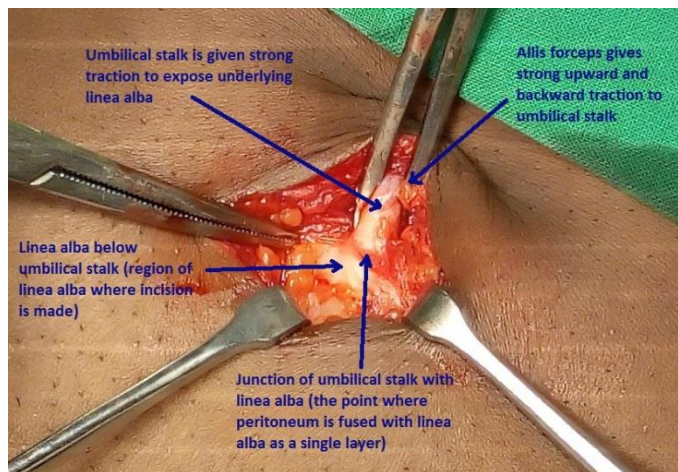


Fig 1 Umbilical stalk is given strong traction with Allis forceps to expose the junction of the umbilical stalk with the linea alba (the point where peritoneum is fused with linea alba as a single layer) where incision is started.

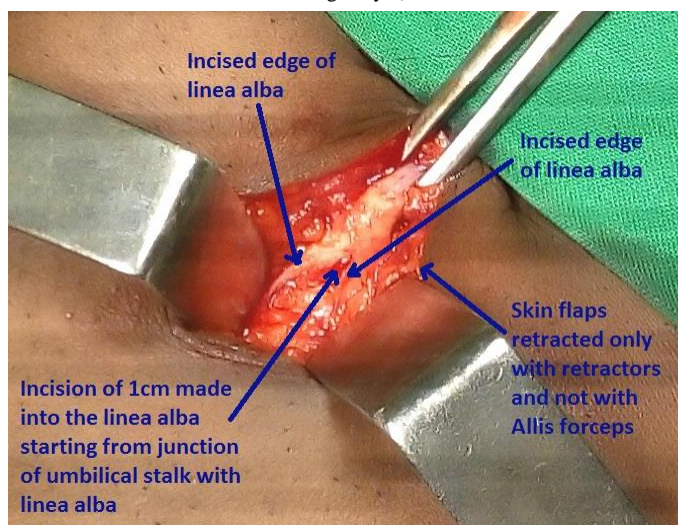


Fig 2 Incision of 1cm is made into the linea alba starting from the junction of the umbilical stalk with the linea alba.

3. The incised edges of the linea alba are held with straight artery forceps and retracted to expose the underlying peritoneum (Fig 3). The peritoneum is opened with the help of blunt tipped medium sized curved artery forceps and not with the help of the knife or blade (Fig 3).
4. Abdominal wall is kept away from the underlying viscera at all times by grasping the umbilical stalk at the depth of wound with Allis forceps (Fig 4). Now the 10mm trocar is removed from its underlying cannula. Then only the blunt cannula without the sharp trocar is inserted into the peritoneal cavity under direct vision (Fig 4).
5. Since incision is made only at the junction of the umbilical stalk with the linea alba where peritoneum is fused with linea alba as a single layer, peritoneum is opened only with the help of blunt medium sized curved artery forceps and only the blunt cannula without the sharp trocar is inserted into the peritoneal cavity under direct vision, none of the 102 patients who underwent open laparoscopy by our technique had injury to the intra-abdominal organs, viscera and blood vessels.

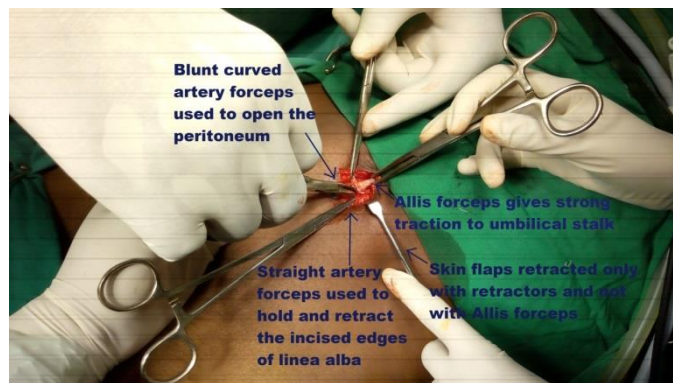


Fig 3 The incised edges of the linea alba are held with straight artery forceps and retracted to expose the underlying peritoneum. The peritoneum is opened with the help of blunt tipped medium sized curved artery forceps and not with the help of the knife or blade.

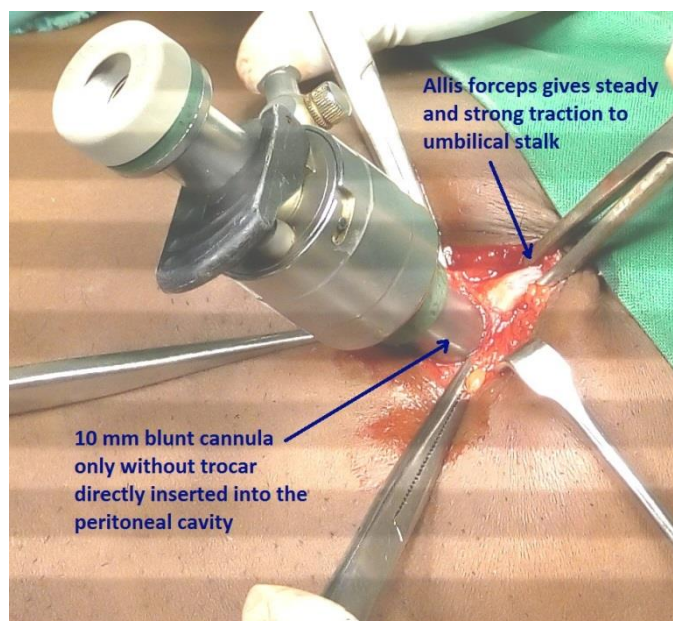


Fig 4 Abdominal wall is kept away from the underlying viscera at all times by grasping the umbilical stalk at the depth of wound with Allis forceps and only the 10mm blunt cannula without sharp trocar is inserted into the peritoneal cavity.

Discussion of advantages and complications of direct trocar insertion into the peritoneal cavity

1. One of the advantages of the direct trocar entry technique is the reduced number of blind insertions required to gain abdominal access(1). However, entry-related complications can occur despite adequate surgical experience and up-to-date equipment(1); surgeons should therefore use the techniques that they are familiar with and feel most comfortable(1).
2. In the study of direct trocar entry method conducted by Jacobson *et al* in 1223 patients, 2 major complications occurred: one omental herniation and one bowel herniation(1).
3. One patient had an omental herniation and required a repeat laparoscopy on postoperative day 2. The second patient had a repeat laparoscopy on the 12th postoperative day to repair a bowel herniation(1).
4. Late minor complications included abdominal wall ecchymosis, wound infection or discharge, granulation tissue formation, delayed healing and minor oozing(1).
5. 11 out of 1223 patients (0.9%) had abdominal wall ecchymosis. 6 out of 1223 patients (0.5%) had wound

infection or discharge. 5 out of 1223 patients (0.41%) had granulation tissue formation(1).

6. 1 out of 1223 patients (0.08%) had delayed healing and 2 out of 1223 patients (0.16%) had minor oozing(1).
7. Direct trocar insertion was first reported in the literature by Dingfelder in 1978 (1 to 3). The suggested advantages of this method of entry is the avoidance of the carbon dioxide embolism(2,4).
8. Laparoscopic entry is initiated with only one blind step (trocar insertion) (2). The direct entry method is faster than any other method of entry(2,5, 6). However it is the least performed laparoscopic technique in clinical practice today(2,7).
9. However being a blind procedure it does not eliminate the risk of bowel and vascular injuries (4).
10. Minor complications resulting from direct trocar insertion include abdominal wall hematoma, wound infection, fascial dehiscence and herniation (4).
11. Copeland *et al* reported on 2000 unselected women with whom direct trocar insertion was utilized(8). Eight cases (0.4%) required conversion to insufflation with Veress needle and one of these resulted in bowel injury. Two additional bowel injuries were encountered with the direct trocar entry (0.1%) (8).
12. Hill and Maher perforated the omentum with the direct trocar in 26 of 542 patients (4.8%), as it was elevated with peritoneum(9).
13. Molloy *et al* reported on a review of 16 739 direct entries(7). Entry-related bowel injury rates were 0.05% (direct entry) (7). Case reports of major vessel injury with direct entry have been reported (10,11). Sharp trocars are recommended for direct insertion technique(2).

CONCLUSION

1. Since incision is made only at the junction of the umbilical stalk with the linea alba where peritoneum is fused with linea alba as a single layer, peritoneum is opened only with the help of blunt medium sized curved artery forceps and only the blunt cannula without the sharp trocar is inserted into the peritoneal cavity under direct vision, none of the 102 patients who underwent open laparoscopy by our technique had injury to the intra-abdominal organs, viscera and blood vessels.
2. Hence the technique of open laparoscopy by using a blunt cannula without the sharp trocar to introduce into the peritoneal cavity under direct vision while doing laparoscopic operations instead of direct trocar insertion into the peritoneal cavity is extremely useful since it avoids the complications of injury to the intra-abdominal organs, viscera and blood vessels.

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