



Research Article

A SAFE METHOD OF OPEN LAPAROSCOPY BY INTRODUCING BLUNT CANNULA INTO THE PERITONEAL CAVITY INSTEAD OF CLOSED METHOD OF INSERTION OF VERESS NEEDLE INTO THE PERITONEAL CAVITY

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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 closed method of insertion of veress needle into the peritoneal cavity and its advantages.

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 closed method of insertion of veress needle 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 closed method of insertion of veress needle 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 closed method of insertion of veress needle 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 closed method of insertion of veress needle 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 closed method of laparoscopy by insertion of veress needle 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 closed method of laparoscopy by insertion of veress needle into the peritoneal cavity, no patient had injury to the intra-abdominal organs, viscera and blood vessels.

DISCUSSION

Technique of Our Open Laparoscopy

1. Our technique begins with transverse infra-umbilical skin incision made well below the umbilicus and grasping the umbilical stalk at the depth of the wound with an Allis forceps (Fig. 1).
2. 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).

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- 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 stab incision over this fibrous structure provides direct access to peritoneum (Fig 2).

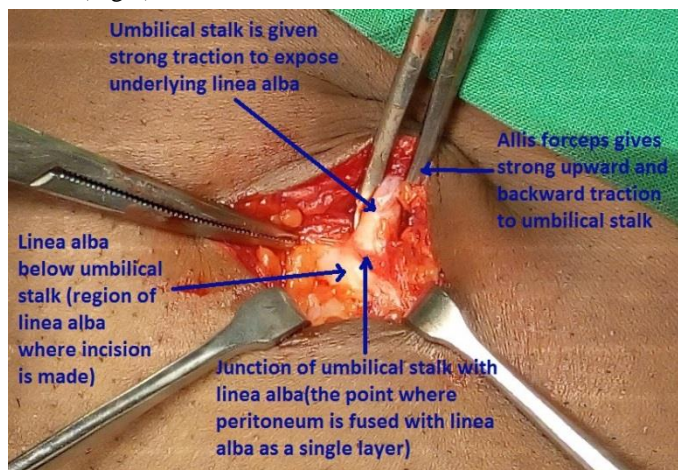


Fig 1 Umbilical stalk is given strong traction with Allis forceps to expose junction of the umbilical stalk with the linea alba (the point where peritoneum is fused with linea alba as a single layer) where incision is started.

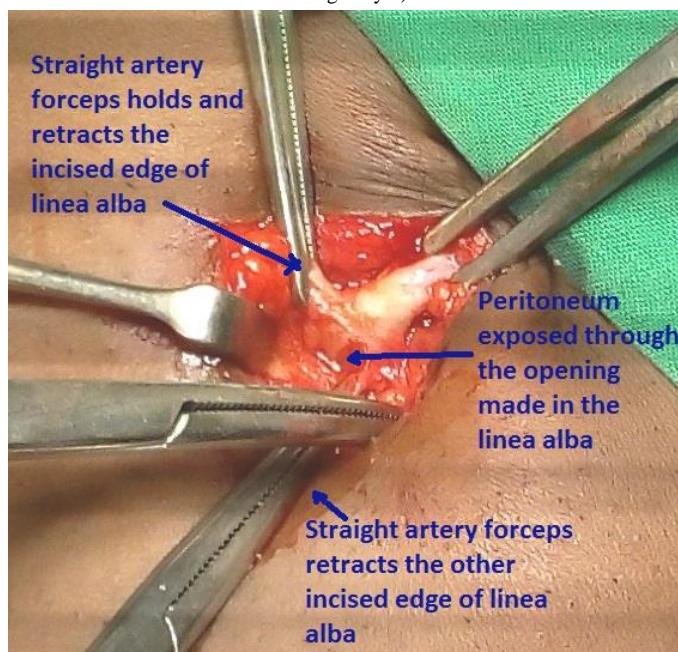


Fig 2 Incision of 1cm is made into the linea alba starting from the junction of the umbilical stalk with the linea alba. The incised edges of the linea alba are held with straight artery forceps and retracted to expose the underlying peritoneum.

- 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 3). The opening in the peritoneum is widened with blunt tipped medium sized curved artery forceps to enter into the peritoneal cavity (Fig 3).
- 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).

- 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

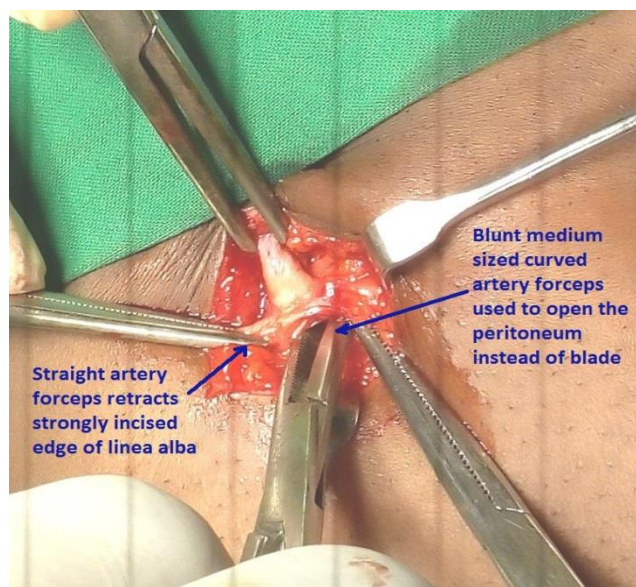


Fig 3 The peritoneum is opened with the help of blunt tipped medium sized curved artery forceps and not with the help of the knife or blade. The opening in the peritoneum is widened with blunt tipped medium sized curved artery forceps to enter into the peritoneal cavity.

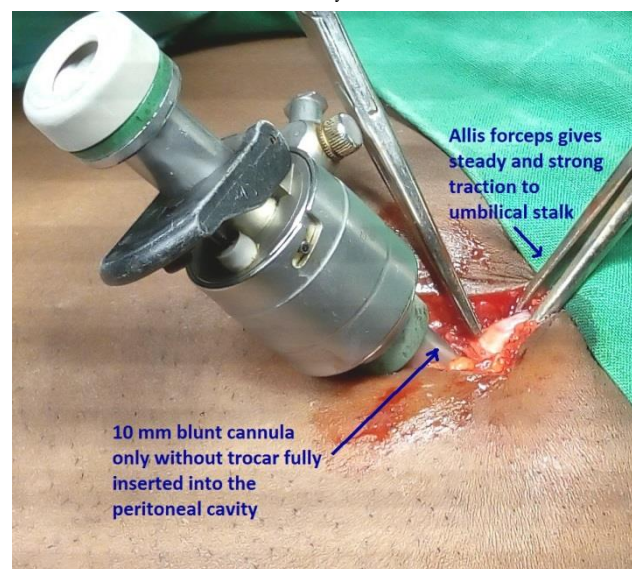


Fig 4 Abdominal wall is kept away from the underlying viscera at all times by grasping the umbilical stalk at the depth of wound with Allis forceps and only the 10mm blunt cannula without sharp trocar is inserted into the peritoneal cavity

Discussion of complications of closed method of insertion of veress needle into the peritoneal cavity

- Comparison between closed and open techniques is inevitable, desirable, and essentially revolve around ease of execution and attendant complications (1 to 4). Extensive meta analysis has shown that the open

- technique, on an average is associated with lower incidence of complications and is cheaper and faster than veress needle technique(1 to 3, 5). As opposed to the veress needle technique, open technique and subsequent insufflation is associated with less insufflation related complications and gas embolism (1, 6).
2. Port placement and creation of pneumoperitoneum is the essential key step in laparoscopic surgery(1 to 3, 7 to 9). Most commonly it is performed by introducing veress needle(1 to 3, 10, 11). It is a safer technique but it is essentially a blind procedure. It is also associated with complications like bowel perforation, major vessels injury, subcutaneous emphysema, etc(2, 3).
 3. In the study of blind insertion of veress needle and closed method of trocar insertion by Bathla V et al (2) in December 2014 in 50 patients, 15 out of 50 patients had port site wound infection(2). Wound infection was common in closed technique. It was superficial and involved only skin and subcutaneous tissue. They resolved by antibiotics and anti inflammatory agent. It didn't require any surgical intervention.
 4. Abdominal wall hemorrhage was seen in in 4 out of 50 patients and gastrointestinal injury was seen in 2 out of 50 patients. (2). In this study there was subcutaneous emphysema in 10 out of 50 patients and port site hernia was seen in 4 out of 50 patients.
 5. In the study of closed technique using insertion of veress needle by Bathla V et al (3) in January 2016 in 100 patients, 15 out of 100 patients had port site wound infection(3). Wound infection was common in closed technique. It was superficial and involved only skin and subcutaneous tissue. They resolved by antibiotics and anti inflammatory agent. It didn't require any surgical intervention(3).
 6. Port site hematoma was seen in 4 out of 100 patients and gastrointestinal injury was seen in 2 out of 100 patients. (3). In this study there was subcutaneous emphysema in 10 out of 100 patients and port site hernia was seen in 4 out of 100 patients(3).
 7. In the study of blind insertion of veress needle and closed method of trocar insertion by Yogendra D Shah (12) in 50 patients, 2 out of 50 patients had port site wound infection(12) and there was no reported case of port site hernia.
 8. Abdominal wall hemorrhage was seen in in 4 out of 50 patients(12). Coagulation or ligation of the bleeding point externally or internally with a laparoscopic approach is the method. Finally, if all such methods fail, a laparotomy should be done to stop the bleeding (12).
 9. Gastrointestinal injury was seen in 2 out of 50 patients (12). It included small bowel (jejunum) injury by trocar inserted for laparoscopic appendectomy and one case of mesenteric laceration. It occurred due to adhesion of peritoneum and bowel to abdominal wall and pointed trocar with sudden give up in the peritoneal cavity(12).
 10. Though both modified open and closed technique were commonly used according to surgeon preference, closed technique was known to have more complications as compared to modified open technique. This is similar to study done by Merlin TL, Hiller JE, Maddern GJ, Jamieson GG, Brown AR, Kolbe A(2003). (2,3, 8,12)
 11. In the era of modern surgery, laparoscopic surgery has gained much popularity amongst the doctor as well as the patients due its advantages like minimal access approach, shorter hospital stay, early return to daily activity and minimal post operative morbidity and good cosmesis(2,3, 12).
 12. However, in laparoscopic surgery, adequate training and surgical expertise is a must(2,3, 12). Primary trocar insertion is a crucial step in laparoscopic surgery(2,3, 12).
 13. Modified open technique comprises insertion of trocar in peritoneal cavity under vision, thus it is more advantageous in hands of inexperienced surgeon, in presence of intra abdominal adhesions and there are less chances of bowel and major vascular injuries(2,3, 12). The appeal of entering the peritoneal cavity through a stab at the depth of umbilical cicatrix lies in its simplicity and relative safety and can be easily mastered (1 to 4, 13 to16).
 14. The success of this technique depends on identifying the umbilical stalk or umbilical cicatrix pillar and the junction of the umbilical stalk with the linea alba(3,9, 17). After making a one cm vertical incision at the junction of umbilical stalk or umbilical cicatrix pillar with the linea alba it is possible to have the peritoneal cavity opened (3,9, 17)while the abdominal wall is kept away from the underlying viscera at all times using Allis forceps or towel clamp (3,9, 17).
 15. Modified open technique of trocar insertion was far better than the closed technique, as it was done under direct vision(2,3). The most common dangerous complications of which surgeon is worried during the primary trocar insertion, like gastrointestinal perforation, major vascular injury and bladder perforation were very less(2) rather nil (3)as compared to the closed technique of trocar insertion.
 16. There was no reported case of gastrointestinal and major vascular injury noted in open technique of trocar insertion, as trocar was introduced under vision in peritoneal cavity in the study done by by Yogendra D Shah (12).
 17. This is similar to the study done by Hasson HM (1999) where incidence of bowel injury in open technique was 0% and also in the study done by Catarci M, Carlini M, Gentileschi P, Santoro E (2001) where incidence was 0.5%.(12, 18, 19).
 18. Hence, the modified open technique of trocar insertion is advocated as a technique of choice in primary trocar insertion as it counts more on patient safety as compared to the closed technique(2,3, 12).

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 closed method of laparoscopy by insertion of veress needle 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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