

Research Article

A SAFE METHOD OF OPEN LAPAROSCOPY BY INTRODUCING BLUNT CANNULA INTO THE PERITONEAL CAVITY INSTEAD OF PRE INSUFFLATED ENTRY METHOD WITH VERESS NEEDLE

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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 the pre-insufflated entry method with Veressneedle and its advantages. **Methods:** From October 13th, 2015, to December 18th, 2019, for a period of 4 years and 2 months, open laparoscopy was done using 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 instead of the pre insufflated entry method with Veressneedle. **Results:** From October 13th, 2015, to December 18th, 2019, for a period of 4 years and 2 months, 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 instead of the pre insufflated entry method with Veress needle, no patient had injury to the intra-abdominal organs, viscera, or 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 the pre insufflated entry method with Veress needle 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 blunt cannula without the sharp trocar to introduce into the peritoneal cavity under direct vision while doing operations instead of the pre insufflated entry method with Veress needle is is extremely useful since it avoids the complications of injury to intra-abdominal organs, viscera, and blood vessels.

MATERIALS AND METHODS

This study was conducted in the department of general surgery at Indira Gandhi Medical College and Research Institute, Puducherry. From October 13th, 2015, to December 18th, 2019, for a period of 4 years and 2 months, open laparoscopy was done using the technique of using a blunt cannula without the sharp trocar to introduce into the peritoneal cavity under direct vision while doing operations like laparoscopic appendectomy and laparoscopic cholecystectomy instead of the pre insufflated entry method with Veress needle.

RESULTS

From October 13th, 2015, to December 18th, 2019, for a period of 4 years and 2 months, while doing 102 laparoscopic operations, which included 42 laparoscopic appendectomies, 28 laparoscopic cholecystectomies, 18 laparoscopic herniarepair (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 the entry method with Veress needle, no patient had injury to the intra-abdominal organs, viscera, and blood vessels.

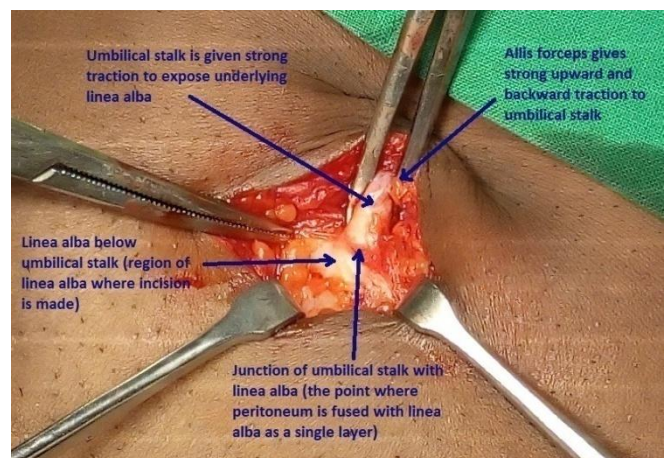


Fig.1 Umbilical stalk is given strong traction with Allis forceps to expose the junction of the umbilical stalk with the linea alba (the point where peritoneum is fused with linea alba as a single layer) where incision is started.

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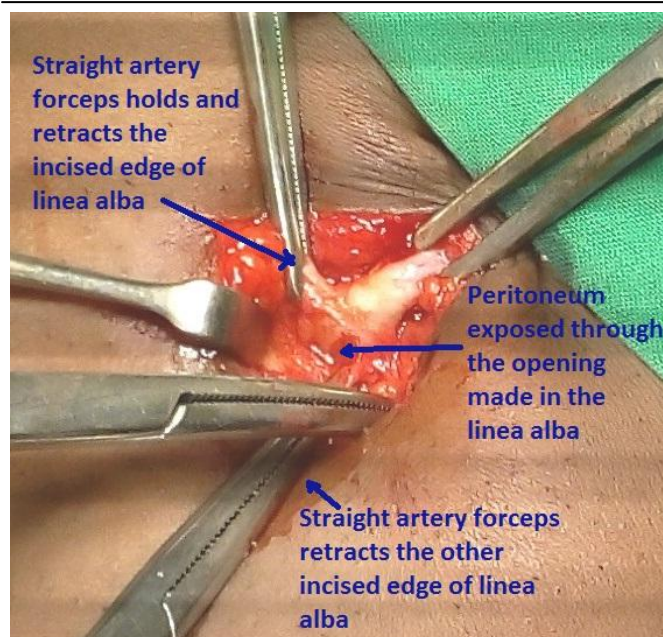


Fig. 2 Incision of 1 cm is made in to the linea alba starting from the junction of the umbilical stalk with the linea alba. The incised edges of the linea alba are held with straight artery forceps and retracted to expose the underlying peritoneum.

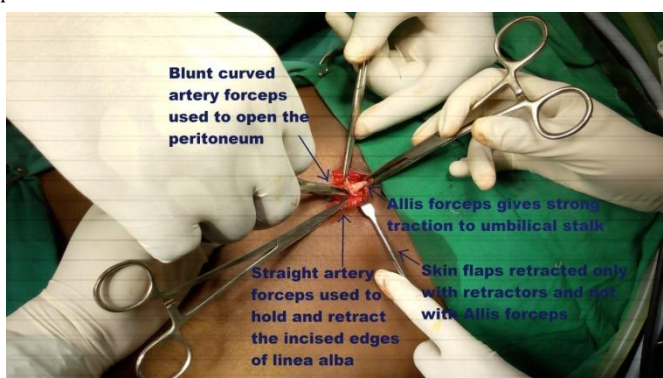


Fig. 3 The peritoneum is opened with the help of blunt tipped medium sized curved artery forceps and not with the help of the knife or blade.

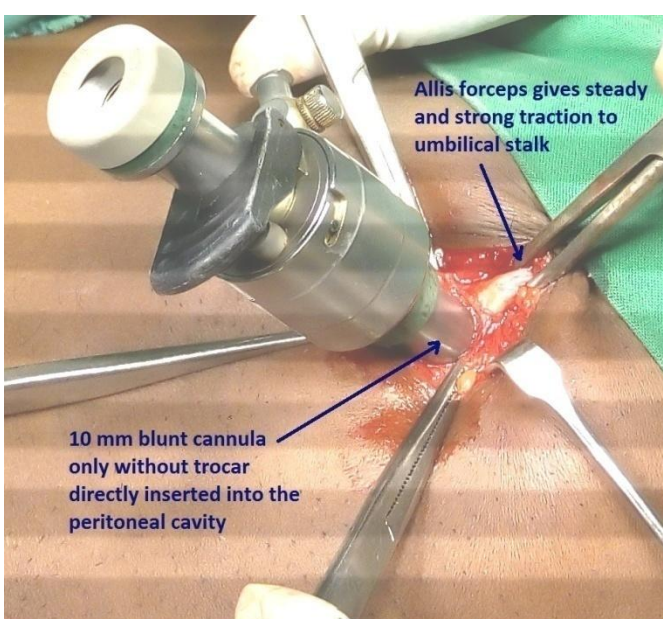


Fig. 4 Abdominal wall is kept away from the underlying viscera at all times by grasping the umbilical stalk at the depth of wound with Allis forceps and

only the 10 mm blunt cannula without sharp trocar is inserted in to the peritoneal cavity

DISCUSSION

Technique of our open laparoscopy

1. The 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, the peritoneum is fused with the linea alba as a single layer (Fig. 1). Hence, an incision of 1 cm is made into the linea alba, starting from the junction of the umbilical stalk with the linea alba (Fig. 2).
3. The incised edges of the linea alba are held with straight artery forceps and retracted to expose the underlying peritoneum (Fig. 2). 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. The abdominal wall is kept away from the underlying viscera at all times by grasping the umbilical stalk at the depth of the wound with Allis forceps (Fig. 4). Now the 10-mm trocar is removed from its underlying cannula. Then only the blue 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 the peritoneum is fused with the linea alba as a single layer, the 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.

Discussion of advantages and complications of the pre insufflate dentistry method with Veress needle

1. Preinsufflate edentry methods with Veress needle mainly include the conventional closed Veress needle insufflation primary entry technique (1) or the closed trocar entry after Veress needle insufflation (1) and the radially expanding access system (1, 2).
2. All injuries to the great vessels caused by the Veress needle reported in the literature resulted from midline punctures in the umbilical region (3, 4). Azevedo et al. claim that insertion of the Veress needle into the left hypochondrium has been reported as safe and effective and potential injuries are less severe (4).
3. The Veress needle is the oldest method, developed by Dr. Veress in 1938, and it is the most used technique, especially in gynecological procedures (4).
4. The radially expanding access system was introduced in 1994. It consists of a 1.9-mm Veress surrounded by an expanding polymeric sleeve. The abdomen may first be insufflated using the Veress needle. The needle is removed, and the sleeve acts as a tract through the abdominal wall that can be dilated up to

- 12 mm by inserting a blunt obturator with a twisting motion (2, 5, or 7).
5. Advantages of this system include elimination of sharp trocars, application of radial force, stabilization of the cannula's position (cannula does not slide in and out), avoidance of injury to abdominal wall vessels, and elimination of the need for suturing of fascial defects (2).
 6. In addition, radially expanding devices demonstrated less postoperative pain and more patient satisfaction than with conventional trocar entry techniques (2, 8, and 11).
 7. Several case series and randomized studies have reported no injury to major vessels and no deaths (2, 5). Abdominal wall bleeding and Veress needle injury to mesentery have been encountered with the radially expanding access system (2, 5).
 8. Commercially available Veress needles vary from 12 to 15 cm in length, with an external diameter of 2 mm. A bezel-shaped tip enables the needle to pierce the tissues of the abdominal wall (4).
 9. Nevertheless, despite this safety device, incorrect insufflations occur. Injuries to major vessels are the leading intraoperative cause of death associated with laparoscopic procedures (4, 12).
 10. The classic location of the Verres needle puncture is the midline of the abdomen near the umbilical scar. Due to the short distance between the anterior abdominal wall and the retroperitoneal vascular structures in this region, less than two centimeters in thin people, punctures pose risks of injury to these large vessels (4, 13). The abdominal aorta, the inferior vena cava, and the common iliac vessels are especially vulnerable to injury during puncture with the Veres sneedle in proximity of the umbilical scar (4).
 11. There are two important factors in the insertion of a veress needle. First, the insertion should not be excessive to avoid the risk of vascular injury. Second, it should be adequate to avoid extra peritoneal in sufflation, because this will lead to failure of the pneumoperitoneum with associated operative difficulty due to inappropriate distension of the anterior abdominal wall and postoperative pain (4).
 12. A study reported that complication rates during the introduction of Veress needle are one attempt 0.8-16.3%, two attempts 16.3-37.5%, three attempts 44.4-64%, and more than three attempts 84.6-100%. The complications associated were extra peritoneal insufflation, omental and bowel injuries, and failed laparoscopy (4, 14).
 13. The rate of carbon dioxide embolism was 0.001% in a review of 489, 335 closed laparoscopies (4, 15). Several case reports have shown fatal or near-fatal coronary, cerebral, or other gas embolisms. Such a complication has not been reported at open laparoscopy (4).
 14. Major vascular injuries caused by the insertion of the Veress needle into the abdominal midline occur even in the hands of experienced surgeons. Schafer et al. analyzed 26 major vascular injuries and reported that only four of them (15%) had been caused by inexperienced surgeons (surgeons who had

performed fewer than 50 laparoscopic procedures). The other 22 injuries (85%) had been caused either by experienced surgeons (those who had performed between 51 and 100 procedures) or by very experienced surgeons (over 100 procedures performed) (4, 16). Thus, it is essential that the position of the needle tip after insertion be determined as accurately as possible (4).

15. Though the complications of operative laparoscopy are low, they can be severe and life-threatening. A search of the Manufacturer and User Facility Device Experience Database (MAUDE) from the Medical Device section of the Food and Drug Administration's Web site (17, 18) lists 25 serious iatrogenic injuries involving Veress needle entry between March 1992 and May 2000. Seventeen (68%) vascular injuries and four (16%) bowel perforations occurred, all requiring exploratory laparotomy (17, 18). One death, as a result of an aortic laceration, was reported (17, 18).

CONCLUSION

1. Since incisions are made only at the junction of the umbilical stalk and the linea alba, where the peritoneum is fused with the linea alba as a single layer, the 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 injuries to the intra-abdominal organs, viscera, and blood vessels.
2. Hence, the technique of open laparoscopy involves using a blunt cannula without a sharp trocar to introduce into the peritoneal cavity under direct vision while doing laparoscopic operations instead of the pre-insufflated entry method, which is extremely useful since it avoids the complications of injury to the intra-abdominal organs, viscera, and blood vessels.

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