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Research Article

A SAFE TECHNIQUE OF OPEN LAPARASCOPY BY USING A BLUNT CANNULA WITHOUT THE SHARP TROCAR TO INTRODUCE INTO THE PERITONEAL CAVITY

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A R T I C L E I N F O

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A B S T R A C T

Objective: To do a safe technique of open laparoscopy by using a blunt cannula without the sharp trocar to introduce into the peritoneal cavity and its advantages.
Methods: From 13th October 2015 to18th 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.
Results: From 13th October 2015 to18th 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, 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 is extremely useful since it avoids the complications of injury to the intra-abdominal organs, viscera and blood vessels.

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 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 to18th 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.

RESULTS

From 13th October 2015 to18th 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 , no patient had had injury to the intra-abdominal organs , viscera and blood vessels.

DISCUSSION

Technique of our open laparoscopy

1. Transverse infra-umbilical incision is made well below the umbilicus (Fig. 1).
2. Skin of the umbilicus is not held with traumatic instruments like Allis forceps or towel clip (Fig 1).
3. Skin flaps are retracted only with retractors and are not held with Allis forceps (Fig 2, 3). Superficial facia is thoroughly dissected beneath the skin flaps.
4. Now a pearly white structure is seen running from linea alba to umbilical cicatrix. Retraction of the skin flaps exposes this ligament like structure running from linea alba to the dermis of umbilical cicatrix. This structure in literature is described as umbilical stalk(1) (Fig 2). This fibrous structure is the embryological remnant of umbilical veins, arteries and urachus(1).
5. 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 2).
6. 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(1) (Fig 2). The correct identification of this point is important, as a simple vertical stab incision over this

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fibrous structure provides direct access to peritoneum(1).

7. Hence a vertical incision is made with15 number knife starting at the junction of the umbilical stalk with the linea alba and extending below for1cm into the linea alba (Fig 3).
8. The incised edges of the linea alba are held with straight artery forceps and retracted to expose the underlying peritoneum (Fig 4).
9. 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). The opening in the peritoneum is widened with blunt tipped medium sized curved artery forceps to enter into the peritoneal cavity(Fig 4).
10. 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 5). 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 5).
11. Since peritoneum is opened only with the help of blunt medium sized curved artery forceps and not with the help of the knife or blade, there is no risk of injury to the intra-abdominal organs, viscera and blood vessels.
12. Since only the blunt cannula without the sharp trocar is inserted into the peritoneal cavity under direct vision, there is no risk of injury to the intra-abdominal organs, viscera and blood vessels.
13. 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

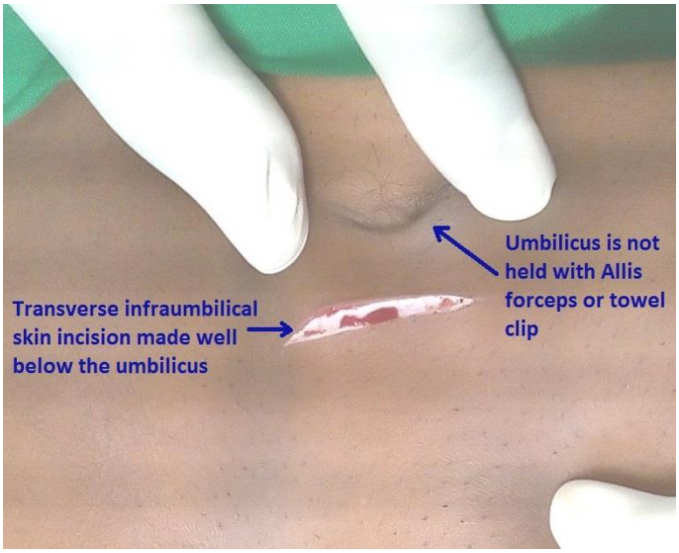

Fig 1 Transverse infra-umbilical incision is made well below the umbilicus and the skin of the umbilicus is not held with Allis forceps or towel clip.

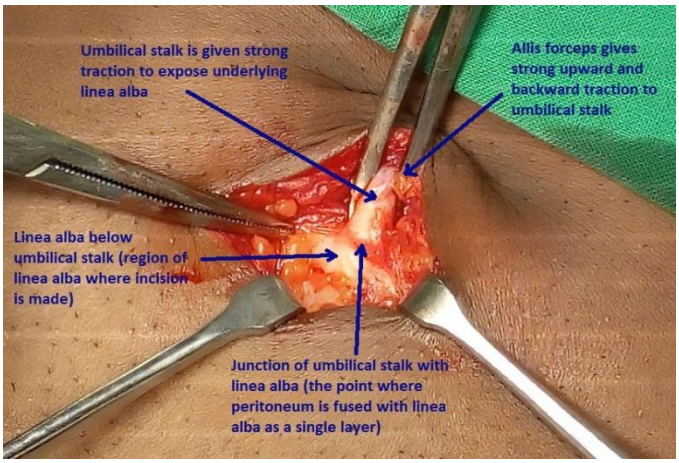

Fig 2 Umbilical stalk is given strong traction with Allis forceps to expose junction of the umbilical stalk with the linea alba(the point where peritoneum is fused with linea alba as a single layer) where incision is started. Skin flaps are retracted only with Langenbeck's retractors and not held with Allis forceps.

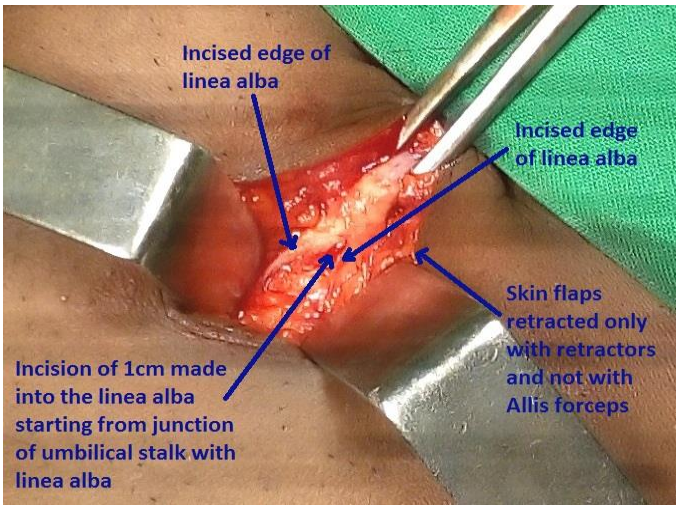

Fig 3 Incision of 1cm is made into the linea alba starting from the junction of the umbilical stalk with the linea alba. Skin flaps are retracted only with retractors and not held with Allis forceps.

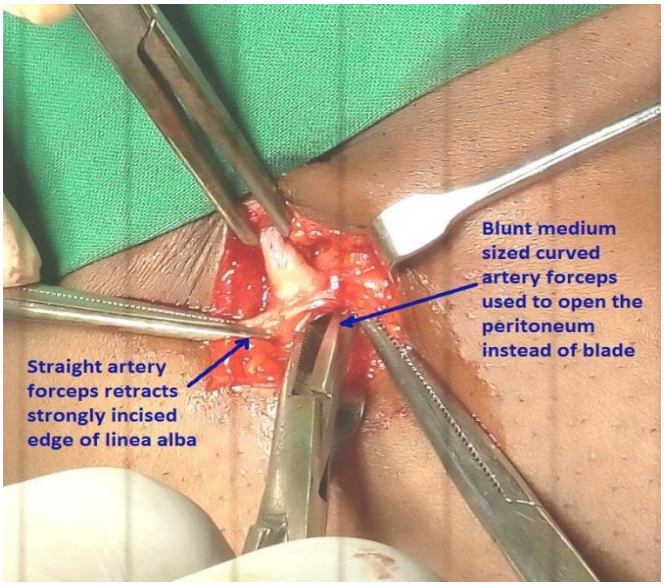

Fig 4 The incised edges of the linea alba are held with straight artery forceps and retracted to expose the underlying peritoneum. The peritoneum is opened with the help of blunt tipped medium sized curved artery forceps and not with the help of the knife or blade .The opening in the peritoneum is widened with blunt tipped medium sized curved artery forceps to enter into the peritoneal cavity.

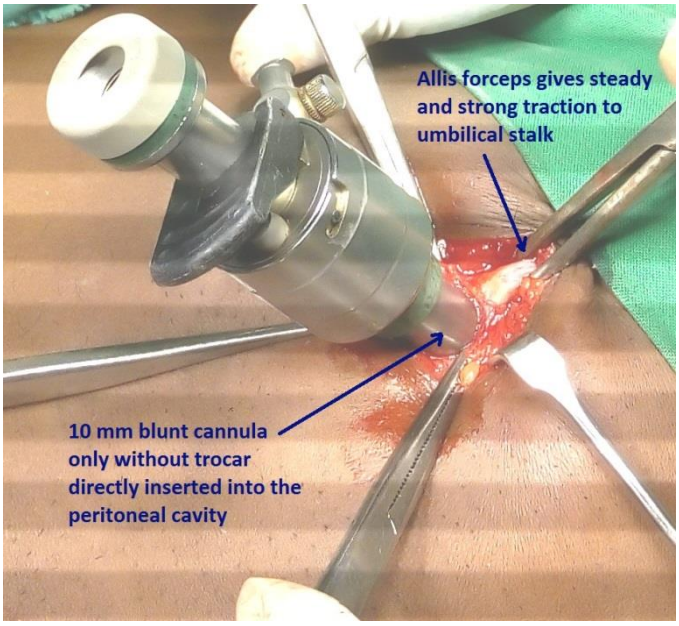

Fig 5 Abdominal wall is kept away from the underlying viscera at all times by grasping the umbilical stalk at the depth of wound with Allis forceps and only the 10mm blunt cannula without sharp trocar is inserted into the peritoneal cavity

Discussion of similarity of our technique with other techniques of open laparoscopy

1. A technique similar to our technique is described before and begins with infra-umbilical skin incision and grasping the umbilical stalk at the depth of wound with an Allis forceps (1 to 6).
2. After making an infra-umbilical transverse skin incision, the subcutaneous tissue is dissected using an artery forceps (1 to 3, 7).
3. This reveals a short glistening white ligament like structure running from the linea alba to the dermis of the umbilical cicatrix (7).
4. This structure has been variously described as umbilical pillar/tube (1, 4, 7) or umbilical stalk (1,5, 7) or umbilical cicatrix pillar (3, 4, 8,9) or umbilical cicatrix tube(4). This fibrous tissue is the embryological remnant of umbilical veins, arteries and urachus(1, 7).
5. Sustained upward traction on the umbilical stalk (7) by grasping the umbilical stalk at the depth of the wound with an Allis forceps (1 to 6) elevates the abdominal wall away from the vital organs and creates a space into which instruments could be safely introduced(7) .
6. This could be difficult in obese patients and requires retraction of the skin edges with Langenbeck's retractors to reach down to the umbilical stalk(1,7, 10)
7. In addition, the junction of the umbilical pillar/ umbilical stalk with the linea alba is the thinnest part of the abdomen and at this point the peritoneum is fused to the linea alba as a single layer (1, 7).
8. A simple stab over this fibrous structure provides direct access to peritoneum (1, 7).
9. Now a vertical incision is made over that structure with15 number knife (1) and the peritoneal cavity is entered (1, 7) with a medium sized artery forceps. The entry wound is enlarged with a medium sized artery forceps (1, 7) and blunt cannula is inserted under direct vision (11).
10. The simplicity, rapidity and inherent safety of this technique merit wider applications(1).
11. The concept of direct peritoneal access through a stab at the depth of umbilical cicatrix lies in its simplicity, relative safety associated with less complications ,easy closure at the end of the procedure and it can be easily mastered(1).
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 3, 7,12 to 15).
13. The success of this technique depends on identifying the umbilical cicatrix pillar and the junction of the pillar with linea alba (3,9, 16). After making a one cm vertical incision at the junction of umbilical cicatrix pillar with the linea alba it is possible to have the peritoneal cavity opened (3,9, 16).
14. The vertical incision at this point provides a rapid, safe and easy access to peritoneal cavity. This technique is safe, effective, easy to learn and quick to perform. This technique clearly displays the point on the abdominal wall where the peritoneum is tightly fused and adherent to the peritoneal cavity in the majority of the cases, while the abdominal wall is kept away from the underlying viscera at all times using Allis forceps or towel clamp(3,9, 16).
15. In the study of open laparoscopy conducted by by Lal P, Vindal A, Sharma R, Chander J, Ramteke VK (9) in January 2012, a transverse subumbilical incision was made showing the umbilical cicatrix pillar and the junction of the umbilical cicatrix pillar with the linea alba. After the incision (1 cm) at the junction of the umbilical cicatrix pillar with the linea alba it is possible to have the peritoneal cavity opened(9, 17). This technique is safe, effective, easy to learn, and quick to perform. The method clearly displays the point on the abdominal wall where the peritoneum is tightly fused and allows direct entry to the peritoneal cavity in the majority of the cases, while the abdominal wall is kept tented and away from the underlying viscera at all times (9, 17).
16. Despite numerous recent technical advances in minimally invasive surgical technique, the potential exists for serious morbidity during initial laparoscopic access. Safe access depends on adhering to well-recognized principles of penetration under direct vision, knowledge of abdominal anatomy, and recognition of hazards imposed by previous surgery (16).
17. Applying these principles, Antevil JL et al describe a safe, rapid, and cost-effective technique for laparoscopic access using readily available instruments (16).
18. This technique emphasizes identification and incision of the point at which the midline abdominal fascia is fused with the base of the umbilicus, and the importance of the application of counter traction directly at the point of insertion (16,17). This method allows penetration under direct vision with minimal controlled axial force, and without the requirement for fascial sutures or other cumbersome aspects of the traditional open technique(16, 17).

19. Knowledge and application of the anatomy of the umbilicus is critical to this method of access. The success of this method depends on identifying the single point where the umbilical fascia and the peritoneum are fused. The incision of this point provides a rapid, safe, and easy access to the peritoneal cavity(16,17).

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 while doing laparoscopic operations is extremely useful since it avoids the complications of injury to the intra-abdominal organs , viscera and blood vessels.

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