

## Open Access Technique in Laparoscopic Surgery - our experience of initial 100 cases

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### ABSTRACT

**Aim:** To evaluate the safety and efficacy of open access technique in laparoscopic surgery.

**Design:** Retrospective study of one hundred patients who underwent laparoscopic surgery.

**Setting:** Avicenna medical college and allied hospitals Lahore.

**Methods:** One hundred consecutive patients from June 2016-july 2017, who had laparoscopic cholecystectomy at Avicenna medical college hospitals were included in this study. All patients had open first port entry before creating pneumoperitoneum. Patients were evaluated for success / failure, time taken to create pneumoperitoneum of 12mmHg pressure and complications of open access technique.

**Results:** Open first port entry was successful in all except one patient to create complete pneumoperitoneum. Average time taken was 4 minutes and 45 seconds. No incidence of bowel, vascular and omental injury was noted. Gas leak around port occurred in 12 cases.

**Conclusion:** Open access technique for first port insertion in laparoscopic surgery is a safe and effective method with very low complication rate.

**Keywords:** Open access, Laparoscopy, Pneumoperitoneum.

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### INTRODUCTION

First challenge of laparoscopic surgery is access through small incisions. Most of the specific complications of laparoscopic surgery occur during access to peritoneum<sup>1,2</sup>.

Iatrogenic Injuries appear to occur most frequently during insertion of trocar into the abdomen or pelvis. Several studies suggest that most of these injuries occur at the first trocar insertion. A study found that 83% of vascular injuries, 75% of bowel injuries, and 50% of local hemorrhage injuries were caused during primary trocar insertion<sup>3</sup>. Such injuries are likely to occur more frequently than reported and can have mortality rate as high as 13%<sup>4,5</sup>.

To minimize entry-related injuries, several techniques, instruments and approaches have been introduced during the last century. These include the Veress-pneumoperitoneum trocar; classic or closed entry,<sup>6</sup> the open (Hasson) technique,<sup>7</sup> direct trocar insertion without prior pneumoperitoneum<sup>8</sup>, use of shielded disposable trocars<sup>9</sup>, optical Veress needle<sup>10</sup> optical trocars<sup>11</sup> radially expanding trocars<sup>12</sup> and a trocar less reusable visual access cannula.<sup>[13]</sup> Among these techniques classic closed entry using Veress needle for pneumoperitoneum before first trocar insertion is still the most common technique used for access<sup>14,15</sup> followed by open (Hasson) technique. Open technique is becoming more popular now as it is considered safer but there are concerns regarding

visceral and vascular injuries, gas leak, time required to gain access and wound complications.

We examined safety and efficacy of our open laparoscopic access technique for successful creation of pneumoperitoneum and incidence of major or minor complications.

### METHODS

One hundred consecutive patients who had laparoscopic surgery at Avicenna medical college hospitals in a period starting from February 2013 till June 2016 were included in this study. All patients had open first port entry before creating pneumoperitoneum. Patients with midline abdominal scars were not included in this study. Patients were evaluated for success / failure of the technique, time taken to create pneumoperitoneum of 12 mm Hg pressure and any major or minor complications of open access technique.

Our technique of access is a little modification of classical Hasson technique and we start by making a curved transverse incision just below the umbilicus. The upper skin flap is elevated with an Allis forceps. The lower flap is retracted using a small right angled retractor. Subcutaneous tissue is dissected till the junction of umbilicus with the linea alba. Rectus sheath is elevated by pulling umbilicus with the help of Allis forceps and a small incision is made in the midline under direct vision. Peritoneum is punctured by a blunt artery forceps carefully. Care is also taken

to avoid big incision as cannula dilates the small incision to make it air tight. If any adhesions are encountered, tip of the little finger is used to separate them. Sharp trocar is removed and blunt cannula is inserted in the peritoneal cavity under vision. High flow insufflation is started to reach pressure of 12mmHg. Finally laparoscope is inserted and the abdominal organs inspected.

## RESULTS

Open technique was successful in creating pneumoperitoneum of 12 mm Hg in all except one patient. This patient had unexpected bowel adhesions just below the umbilicus and peritoneum could not be entered from that area. Pneumoperitoneum was instead achieved at the Palmer's point by open technique followed by a supra umbilical port insertion under vision. Time taken to establish pneumoperitoneum ranged from 3 to 12 minutes with an average of 4 minutes and 45 seconds.

No incidence of bowel, vascular, omental or bladder injuries occurred in these patients. Twelve patients had problem of gas leak around primary port which was managed by purse string suture in the rectus sheath around the port.

## DISCUSSION

In our study, we found that open laparoscopic entry did not cause any bowel, bladder, omental or vascular injury.

Lack of fatal vascular injuries in open access technique is most significant as it has a high mortality and disproportionately higher incidence of litigation<sup>16</sup>. In literature, there are no reported cases of fatal vascular injury and very few cases of non-fatal aortic injury associated with the open access<sup>17</sup>. One of these had aorta injured at the time of skin incision by scalpel and the other was injured by a sharp spike of damaged tip of Hasson cannula. A meta-analysis of 760,890 closed laparoscopy and 22,465 open laparoscopy cases reported that the incidence of vascular injury rate in closed laparoscopy was 0.44% compared with 0% in open laparoscopy<sup>18</sup>. The incidence of bowel injury was 0.7% compared to 0.5%, respectively. The authors concluded that the open (Hasson) technique eliminates the risk of vascular injury and gas embolism and reduces the risk of bowel injury and recommend the open technique to be adopted for primary laparoscopic entry<sup>18</sup>. Abdominal visceral injuries especially bowel, can also be life threatening. These injuries are easily missed during closed entry and may only be recognized when peritonitis develops. A

major advantage of open access is immediate identification and management of these visceral injuries.

Cochrane systemic review 2015 showed that an open-entry technique is associated with a reduction in failed entry when compared to a closed-entry technique<sup>19</sup>. We had one case where entry was not possible through primary umbilical site due to unexpected bowel adhesions just below the umbilicus and Palmer's point was used for initial entry.

Quickest method of entry is direct trocar entry but it has higher complications<sup>20</sup>. In its clinical practice guideline on the pneumoperitoneum for laparoscopic surgery, the European Association for Endoscopic Surgery states that insertion of the first trocar with the open technique is faster as compared to the Veress needle<sup>21</sup>. In our study time taken to establish pneumoperitoneum ranged from 3 to 12 minutes with an average of 4 minutes and 45 seconds and it was also observed that time taken during open access technique reduces with practice.

Incidence of gas leak around first port was 12 percent in our study while its reported incidence in other studies is around 5 percent<sup>22</sup> as we do not apply any suture around first port if there is no gas leak. A purse string suture in the rectus sheath around first port can easily control this leak and same suture can be tightened at the end of procedure to close the defect in rectus sheath.

## CONCLUSION

We found in our initial study that open access technique for first port insertion in laparoscopic surgery is a safe and effective method with very low complication rate.

## REFERENCES

1. Nuzzo G, Giulianti F, Tebala GD, et al. Routine use of open technique in laparoscopic operations. *J Am Coll Surg* 1997;184:58-62.
2. www.fda.gov>Medical Devices> Medical Device Safety> Safety communications. Oct 6, 2014.
3. Champault G, Cazacu F, Taffinder N. Serious trocars accidents in laparoscopic surgery: a French survey of 103,852 operations. *Surg Laparosc Endosc*. 1996;6:367-70.
4. Chandler JG, Corson SL, Way LW. Three spectra of laparoscopic entry access injuries. *J Am Coll Surg*. 2001;192:478-490.
5. Bhojru S, Vierra MA, Nezhat CR, Krummel TM, Way LW. Trocar injuries in laparoscopic surgery. *J Am Coll Surg*. 2001;192:677-683.
6. Palmer R. Safety in laparoscopy. *J Reprod Med* 1974;13:1-5.
7. Hasson HM. A modified instrument and method for laparoscopy. *Am J Obstet Gynecol* 1971;110:886-7.
8. Dingfelder JR. Direct laparoscopic trocar insertion without prior pneumoperitoneum. *J Reprod Med* 1978;21:45-7.
9. Nezhat FR, Silfen SL, Evans D, Nezhat C. Comparison of direct insertion of disposable and standard reusable

- laparoscopic trocars and previous pneumoperitoneum with Veress needle. *ObstetGynecol* 1991;78:148–50.
10. Riek S, Bachmann KH, Gaiselmann T, Hoernstein F, Marzusch K. A new insufflation needle with a special optical system for use in laparoscopic procedures. *ObstetGynecol* 1994;84:476–8.
  11. Kaali SG. Introduction of the Opti-Trocar. *J Am AssocGynecol* 1993;1:50–3.
  12. Turner DJ. A new radially expanding access system for laparoscopic procedures versus conventional cannulas. *J Am AssocGynecolLaparosc* 1996;34:609–15.
  13. Krishnakumar S, Tambe P. Entry Complications in Laparoscopic Surgery. *Journal of Gynecological Endoscopy and Surgery*. 2009;1(1):4-11.
  14. Jansen FW, Kolkman W, Bakkum EA, de Kroon CD, Trimbos-Kemper TCM, Trimbos JB. Complications of laparoscopy: an inquiry about closed versus open-entry technique. *Am J ObstetGynecol* 2004;190:634–8.
  15. Lingam K, Cole R. Laparoscopy entry port visited: a survey of practices of consultant gynaecologists in Scotland. *GynaecolEndosc* 2001;10:335–42.
  16. Catarci M, Carlini M, Gentileschi P, Santoro E, for the Lap Group Roma. Major and minor injuries during the creation of pneumoperitoneum: a multicenter study on 12,919 cases. *Surg Endos* 2001;15:566–9.
  17. Hanney RM, Carmalt HL, Merrett N, Tait N. Use of the Hasson cannula producing major vascular injury at laparoscopy. *SurgEndosc*. 1999;13:1238–1240
  18. M. Larobina and P. Nottle, "Complete evidence regarding major vascular injuries during laparoscopic access," *Surgical Laparoscopy, Endoscopy and Percutaneous Techniques*, vol. 15, no. 3, pp. 119–123, 2005
  19. Laparoscopic entry techniques. Ahmad G, Gent D, Henderson D, O'Flynn H, Phillips K, Watson A. *Cochrane Database Syst Rev*. 2015 Aug 31;8:CD006583.
  20. Comparison of Direct Trocar Entry and Veress Needle Entry in Laparoscopic Bariatric Surgery: Randomized Controlled Trial. Ertugrul I, Kayaalp C, Yagci MA, Sumer F, Karagul S, Tolan K. *J LaparoendoscAdvSurg Tech A*. 2015 Nov;25(11):875-9
  21. Neudecker J, Sauerland S, Nengebauer F, Bergamaschi R, Bonjer HJ, Cuschieri A. The European Association for Surgery Clinical Practice Guideline on the pneumoperitoneum for laparoscopic surgery. *SurgEndosc* 2002;16:1121–43.
  22. Gordon S, Maher P, Seman E. Open laparoscopy utilizing either a 5 mm or 10 mm standard intra-umbilical trocar. *GynaecolEndosc* 2001;10(4):249-252.