



Veress Needle Technique –A Gold Standard Method for Attaining Pneumoperitoneum in Laparoscopic Appendicectomy- A Comparison with Open Technique

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Abstract

Aim: To compare outcome and complications in open technique and closed veress needle technique in laparoscopic appendicectomy.

Methods: A randomized study conducted in 90 patients undergoing laparoscopic appendicectomy in Al Azhar Medical College and Hospital from February 2018 to February 2019. Patients fulfilling the Inclusion-Exclusion criteria were included in the study. Group A constituted 45 patients who underwent Open (Hasson) technique while Group B also contains same number of patients who were taken up for Closed (Veress) technique. Open technique was performed through stab incision and then dissecting the fascia for gaining access to the abdomen by inserting the trocar, while the closed technique involves the direct insertion of veress needle into the abdominal cavity for pneumoperitoneum creation and then trocar placement. The parameters used for comparison were access time, gas leak, visceral injury, vascular injury, need for conversion, port site haematoma /infection/hernia. Cases were assessed on 1st postoperative day, then followed up at 1 week, 2 months, 6 months.

Results: Out of 90 patients, 60 males and 30 females in the age group of 20 to 50 years were included in the study. Mean access time for pneumoperitoneum was 4+/-1 minute in open technique versus 3+/-1 in open technique. Gas leak was observed in 10 patients in group A and 2 patients in Group B. Pneumoperitoneum was attained in all cases. There was no case of visceral/vascular injury or conversion to open technique. 3 patients had postoperative haematoma in Group A. 5 patients had port site infections in Group A. Post operative hernia was not detected in 6 months postoperative follow up period.

Conclusion: Both open and closed method to gain access into peritoneal cavity are safe but Veress needle method has the advantage of quicker access time, fewer complications in comparison to open technique.

Keywords: Pneumoperitoneum, Open Technique, Closed Veress needle Technique, Laparoscopic Appendicectomy.

Introduction

Access into abdomen is the one challenge of laparoscopy that is particular to the insertion of

surgical instruments through small incisions. Laparoscopic approach is the method of choice for treating benign abdominal diseases requiring

surgery. However, laparoscopic procedures are not risk free. Complications of laparoscopic surgery are rare and commonly occur while attempting to gain access into the peritoneal cavity¹. Creating pneumoperitoneum is the first and most critical step of laparoscopic surgery as it can cause injuries to gastrointestinal tract and major blood vessels and atleast 50% of these complications occur before starting surgery².The number of vascular injuries in laparoscopic surgery is 2 in 10000 procedures and a serious complication associated with mortality occurs in 3.3 per 1,00,000 cases³.There are 2 methods for creating pneumoperitoneum- the closed technique (Veress needle)⁴, and open technique(Hassons)⁵. There are many studies regarding how pneumoperitoneum should be created but the decision ultimately rests on the surgeons experience and preference.

Materials and Methods

This randomized comparative study was conducted from February 2018 to February 2019 in department of general surgery, Al Azhar Medical College, Kerala. A total of 90 patients in the age group of 20 to 50 years were included in the study.

Inclusion Criteria: Patients with symptoms of acute appendicitis without any contraindications for laparoscopic surgery.

Exclusion Criteria: Contraindications for laparoscopic procedure like respiratory compromise, malignancy, or other comorbidities were excluded from the study. Cases with complications like appendicular mass or abscess were excluded.

For all the patients the diagnosis was confirmed by detailed history and examination followed ultrasound and abdomen. CT Abdomen was taken in certain cases.

Group A contained 45 patients who were randomized for open technique and Group B contained 45 patients who underwent closed technique. Open technique was performed through stab incision and then dissecting the fascia for

gaining access to the abdomen by inserting the trocar, while the closed technique involves the direct insertion of veress needle into the abdominal cavity for pneuoperitoneum creationu and then trocar placement. The parameters used for comparison were access time, gas leak, visceral injury, vascular injury, need for conversion, port site haematoma /infection/hernia .Cases were assessed on 1st postoperative day, then followed up at 1 week,2 months,6months. Data thus collected was tabulated and analysed using appropriate statistical technique.

Result

Out of 90 patients 60 were male and 30 female. Age group ranged from 20-50 years with mean age of 40 years. The mean access time needed for creating pneumoperitoneum was 4+/-1 minute in open technique and 3+/-1 minute in closed technique (Table 1).Gas leak was observed in 10 cases in Group A and 2 cases in Group B (TABLE 2). Pneumoperitoneum was obtained in all the cases. There were no cases of visceral injury while inserting trocar. No vascular injury occurred in any of the patients. None of the cases were converted into open appendicectomy. Postoperative complications were as follows- 3 cases in Group A had umbilical port site haematoma, 5 cases in Group A had surgical site infection at umbilical port. No complications noted in Group B. None of the cases had umbilical hernia postoperatively during the 6 month follow up period.

Table 1: comparison of access time in both groups

	Open technique- group A	Closed technique- group B	P value
Access time (minutes)	4± 1	3± 1	0

Table 2 Comparison of gas leak

	Open technique	Closed technique	P value
Cases with gas leak	10	2	0.316

Table 3 Comparison of port site complications

	Open technique	Closed technique	P value
Port site hematoma	3	0	0.154
Port site infection	5	0	0.042
Umbilical port site hernia	0	0	0

Discussion

Over the last two decades rapid advancements have made laparoscopic surgery a well established procedure for both diagnostic and therapeutic purpose. Laparoscopic approach is the method of choice for treating benign abdominal diseases requiring surgery. To establish pneumoperitoneum, access to the peritoneal cavity can be gained through minilaparotomy and insertion of laparoscopic trocar. Alternatively an optical trocar can be blindly inserted into the peritoneal cavity or veress needle may be inserted through abdominal midline.

In our study access time for pneumoperitoneum creation and insertion of camera port was lesser in closed technique, in Scandinavian journal the access time was 214- 300 seconds⁶, compared to other studies 240- 300 seconds for open access^{6,7,8}. Bogotta reported 130 seconds for closed pneumoperitoneum⁹. Byron et al. also reported 2.2 mins¹⁰. Argoli et al. also reported longer access time with veress needle¹¹. In a study by Somro et al. the time used for creation of pneumoperitoneum was 5 mins by closed and 8 minutes by open technique¹².

In our study 10 patients in open technique and 2 patients each in closed technique developed gas leak. The number of entry related complications with open technique was significantly higher than closed technique.

Meta-analysis failed to reveal any safety advantage of open versus closed technique of entry in terms of both visceral and vascular injury. It must be noted that the included randomised control trials had insufficient power to effectively demonstrate an advantage¹³.

In our study, open technique 3(6.66%) developed port site hematoma, which was not noted in closed technique. Our results are comparable to other

studies like Shindholimath et al. -6.3%, Colizzi et al. 2%^{14,15}. Umbilical port site infection was noted in 5(11.11%) of open technique cases. Superficial skin infection is more common and has been reported by studies¹⁶.

No port site hernia was reported in our study, but in other study it was 1.7%¹⁷.

Conclusion

Both open and closed technique for gaining access into peritoneal cavity are safe. But veress needle is quicker with fewer associated complications. As per our study veress needle technique should be considered as gold standard method for attaining pneumoperitoneum.

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