

## Original Research Article

# Modified Hasson technique versus Veress technique: a comparative study

Robinson George<sup>1</sup>, Mebin Mathew<sup>1\*</sup>, Veerabhadra Radhakrishna<sup>2</sup>,  
Ashna Rahman<sup>1</sup>, Ashwini Thenamangalath<sup>1</sup>

<sup>1</sup>Department of General Surgery, Al Azhar Medical College, Idukki, Kerala, India

<sup>2</sup>Department of Pediatric Surgery, Bangalore Medical College and Research Institute, Bengaluru, Karnataka, India

**Received:** 30 June 2019

**Revised:** 10 August 2019

**Accepted:** 16 August 2019

**\*Correspondence:**

Dr. Mebin Mathew,

E-mail: docrg7@hotmail.com

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### ABSTRACT

**Background:** There are two techniques of port placement for laparoscopy, Veress and Hasson. Both have their own advantages of disadvantages. Plenty of new modifications of these techniques have been tried to reduce the risks. We modified Hasson's technique and evaluated whether the technique is better than the standard Veress technique.

**Methods:** A retrospective analysis was carried out in the Department of General Surgery, Al Azhar Medical College Hospital, India from January 2013 to December 2018.

**Results:** There were 156 patients in group A who underwent laparoscopy by Modified Hasson technique. The Veress technique was used in 149 patients who belonged to group B. There was no difference between the two groups in terms of age and indications for the surgery. The entry time (the time to place the first port) for group A was significantly lesser than that of group B ( $2.08 \pm 0.65$  min vs.  $4.59 \pm 0.53$  min;  $p=0.000$ ). There were a total of two complications in group A which was significantly lesser than that of group B (14;  $p=0.002$ ). There was no significant difference between the two groups in terms of extraperitoneal port placement, intraperitoneal injury, failure to enter the abdomen, port site seroma, port site infection, port site hematoma, and mortality. But, port site hematoma was significantly lesser in group A compared to group B (0 vs. 5;  $p=0.027$ ).

**Conclusions:** Modified Hasson's entry was found to be much better than Veress needle entry due to its simplicity for beginners in laparoscopy, lesser time of achieving pneumoperitoneum and lesser duration of surgery in our study.

**Keywords:** Hasson technique, Veress needle, Seroma, Rural, Laparoscopy

### INTRODUCTION

Laparoscopy is a common procedure in many surgical and gynecological specialties. The complications that arise from laparoscopy are often, related to initial entry or the first port placement into the abdomen. Life-threatening complications include injury to the viscera (e.g., bowel, bladder) or to the vasculature (e.g., major abdominal, anterior abdominal wall vessels, and aorta). No clear consensus has been reached yet, as to the optimal technique of entry into the peritoneal cavity for laparoscopic procedures.

Despite, monumental recent technical advances in minimally invasive surgical techniques, creating pneumoperitoneum, is still a prerequisite for laparoscopy. The correct method for gaining access into the abdominal cavity is quite a dilemma, and complications related to the entry technique could be a cause of mortality.<sup>1-3</sup>

The Veress needle technique is the most commonly used, classical and time tested method. But, it is associated with very slow insufflation rates (depending on the brand of equipment) and potentially life-threatening complications.<sup>4</sup> Hence, Hasson introduced an open

technique method for port insertion for laparoscopy in 1971.<sup>5</sup> Many studies evaluating the advantages and disadvantages of closed or open methods for creation of pneumoperitoneum have been conducted. However, randomized, multicenter clinical studies have not been able to provide a definite answer to which of the two methods is safer.<sup>6</sup> Both closed and open techniques are being used simultaneously with varying frequencies. Some studies with slight modifications of both basic approaches have been published and others are on trial. None of the procedures currently used to achieve access to the abdomen in laparoscopic surgery is totally efficacious or free of complications. Accordingly, several approaches and techniques have been investigated. Two such methods are the standard technique of insufflation by insertion of the Veress needle (VN) and direct trocar (DT) entry without prior pneumoperitoneum. Several studies have suggested that DT entry is a safe alternative to VN entry, but few were prospective and only 3 were randomized. Although DT is faster than any other method of entry, it is the least performed laparoscopic technique. Complications of laparoscopic surgery appear to be primarily entry-related and independent of surgical complexity. Several studies have suggested that the initial trocar insertion is the most dangerous step in minimally invasive surgery.

We have been using the open technique with a slight modification. The study was conducted to appraise our experience with the modified open technique with the objective of evaluating time consumed during the creation of pneumoperitoneum, and to observe complications occurring during the procedure.

## METHODS

All the patients admitted in the surgical wards in all the units of Al Azhar Medical College, Idukki, India between January 2013 and December 2018 who underwent laparoscopic surgery by either Modified Hasson technique or Veress technique were included in the study. The patients with incomplete data and patients with previous abdominal surgery were excluded from the study.

All the surgeries were performed under general anaesthesia. The patients who underwent Modified Hasson technique were placed in group A and the patients who underwent the Veress technique were placed in group B. The Veress technique was performed as per the standard technique.<sup>7</sup>

### *Modified Hasson technique*

A supraumbilical curved incision of one to two centimeters was placed. The subcutaneous tissue was separated to identify the fibrous stalk of umbilicus, which was traced to its junction with linea alba. Then the deep fascia where peritoneum is always adherent was identified, incised, and dilated with the Langenbeck

retractors. Now the blunt port could be inserted under vision. This technique differs from original Hasson's technique where all the layers of the abdominal wall are encountered. Then the pneumoperitoneum was created by insufflation. The laparoscope was introduced. The "entry time" was calculated from the time of incision to the time of introduction of laparoscope.<sup>8</sup>

Post-operatively, analgesics were given for 24 hours. Patients were discharged after 24 hours. Sutures were removed on 5th day post-operatively. Patients were advised to come for a follow-up at one month, three months, and later SOS. The complications during the operative and postoperative periods were recorded duly.

### *Statistical analysis*

Data analysis was carried out using "IBM SPSS Statistics for Windows, Version 22.0. Armonk, NY: IBM Corp." The age and the "entry time" were expressed in mean  $\pm$  standard deviation. The gender, indication for surgery, and complications were expressed in number and percentage. Fischer's exact test and Independent sample 't' test was used to measure the difference between the two groups. The difference was considered significant if the 'p' value was  $<0.05$ .

## RESULTS

There were a total of 337 patients underwent laparoscopic surgery during the study period. Twenty patients with previous abdominal surgeries and 17 patients with incomplete data were excluded from the study. Hence, a total of 305 patients were considered for the analysis.

The mean age of the study population was  $36.5 \pm 11.7$  years. Males were predominant (M:F=197:108). The indications for surgery included acute appendicitis (104 patients; 34%), cholelithiasis (66 patients; 22%), inguinal hernia (100 patients; 33%), varicocele (24 patients; 8%), and benign masses (11 patients; 4%). The mean "entry time" was  $3.3 \pm 1.4$  minutes (Table 1).

The postoperative complications included port site seroma [5 (1.6%)], port site hematoma [5 (1.6%)] and port site infection [6 (2%)]. The port site seroma, hematoma as well as the port site infection, were found at the umbilical port following surgery for appendicular perforation. There was no incidence of extraperitoneal port placement, failure to enter the abdomen, intraabdominal injury or port site hernia. There was no mortality in the study group (Table 1).

There were 156 patients in group A who underwent laparoscopy by Modified Hasson technique. The Veress technique was used in 149 patients who belonged to group B. There was no difference between the two groups in terms of age and indications for the surgery (Table 2). The entry time (the time to place the first port) for group A was significantly lesser than that of group B ( $2.08 \pm 0.65$

min vs.  $4.59 \pm 0.53$  min;  $p=0.000$ ). There were a total of two complications in group A which was significantly lesser than that of group B (14;  $p=0.002$ ). There was no significant difference between the two groups in terms of extraperitoneal port placement, intraperitoneal injury,

failure to enter the abdomen, port site seroma, port site infection, port site hematoma, and mortality. But, port site hematoma was significantly lesser in group A compared to group B (0 vs. 5;  $p=0.027$ ) (Table 2).

**Table 1: Patient characteristics, techniques, indications, entry time, and complications.**

Variables	
Mean age (years)	36.5±11.7
Gender (male:female)	197:108
<b>Techniques, N (%)</b>	
Modified Hasson	156 (51)
Veress	149 (49)
<b>Indications, N (%)</b>	
Appendicitis	104 (34)
Inguinal hernia	100 (33)
Cholelithiasis	66 (22)
Varicocele	24 (8)
Benign masses	11 (4)
Mean entry time (min)	3.3±1.4
<b>Complications, N (%)</b>	
Total	16 (5.2)
Extraperitoneal port placement	0
Intraperitoneal injury	0
Failure to enter the abdomen	0
Port site seroma	5 (1.6)
Port site infection	6 (2)
Port site hematoma	5 (1.6)
Port site hernia	0
Mortality	0

**Table 2: Modified Hasson vs. Veress technique.**

Parameters	Modified Hasson (n=156)	Veress (n=149)	'p' value
Mean age (years)	37.15±12	35.8±11.4	0.3*
<b>Indications</b>			
Appendicitis	52	52	0.8 <sup>#</sup>
Inguinal hernia	53	47	0.7 <sup>#</sup>
Cholelithiasis	33	33	0.8 <sup>#</sup>
Varicocele	10	14	0.3 <sup>#</sup>
Benign masses	8	3	0.14 <sup>#</sup>
<b>Clinical parameters</b>			
Entry time (min)	2.08±0.65	4.59±0.53	0.000*
<b>Complications</b>			
Extraperitoneal insufflation	0	0	-
Intraperitoneal injury	0	0	-
Extraperitoneal port placement	0	0	-
Seroma	1	4	0.16 <sup>#</sup>
Hematoma	0	5	0.027 <sup>#</sup>
Infection	1	5	0.09 <sup>#</sup>
Port site hernia	0	0	-
Mortality	0	0	-

\*Independent sample 't' test, <sup>#</sup>Fischer's exact test.

## DISCUSSION

The two basic techniques used to gain access into the peritoneal cavity during laparoscopic procedures are the blind Veress needle and the open technique by placing the trocar under direct vision. Both of these techniques have advantages and disadvantages. Major vascular injury during insertion of a Veress needle or of the first trocar is the most dangerous and life-threatening complication. Major retroperitoneal vessels involved include the vena cava, aorta, right renal vessels, iliac or mesenteric vessels with a mortality of 15%.<sup>9-10</sup> The benefits of the open technique for gaining access into the abdominal cavity were described by Hasson about 3 decades ago.<sup>11</sup> Direct vision allows safe entry by avoiding bowel injury, and even if it occurs, allows immediate recognition and surgical repair. In a pursuit to minimize the complications that occur during gaining access into the abdominal cavity, studies using modified techniques of both open<sup>12</sup> and closed<sup>13</sup> basic approaches have been carried out while others are underway.

There are many older randomized controlled as well as recent studies reporting the open technique as quick and associated with fewer minor complications.<sup>12,14-21</sup> We are in agreement with the present series which report that this technique can be used routinely in the obese and in patients with previous abdominal surgery.<sup>22</sup>

This modified open technique for gaining access into the abdominal cavity affords several distinct advantages over the conventional direct open technique or Veress needle. This is a simple, safe method for penetration, under direct vision without inconvenient aspects of the conventional open method. This provides few, important technical differences with the conventional Hasson technique, which enable quicker and safer entry as well as rapid closure of the port. The point of port entry, provide a single layer of fascia with firmly adherent peritoneum, without encountering any muscular layer, whereas, in the conventional Hasson technique, stay sutures are mandatory and entry into the peritoneum is layer by layer. This technique also entails minimal gas leakage around the cannula, compared with the traditional open technique which, was mainly attributed to the facial defect smaller than the size of the cannula that is to be inserted. Important factors involved in laparoscopic access injuries include inadequate stabilization of the abdominal wall, excessive resistance to the trocar insertion and misdirected or poorly controlled force along the axis of the trocar, while the safety of laparoscopic entry depends on the control of axial force and controlled entry into the peritoneal cavity.<sup>2,23</sup> Keeping these factors in view, the modified open technique seems to be ideal.

There are a few other studies that are similar to our study.<sup>12,19-21</sup> Authors report similar advantages and encouragement using a modified open technique. We found subtle differences in these techniques compared to ours. Motivated by the sublime results of this study and

similar results from other studies, as discussed above, we strongly recommend this technique as a simple, safe, and quick approach to be used routinely in all cases of laparoscopy.

## CONCLUSION

Modified Hasson's entry was found to be much better than Veress needle entry due to its simplicity for beginners in laparoscopy, lesser time of achieving pneumoperitoneum and lesser duration of surgery.

## ACKNOWLEDGEMENTS

We would like to thank our Head of Department Dr. E. J. Samuel in his constant encouragement and support to excel in our endeavors.

*Funding: No funding sources*

*Conflict of interest: None declared*

*Ethical approval: The study was approved by the Institutional Ethics Committee*

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**Cite this article as:** George R, Mathew M, Radhakrishna V, Rahman A, Thenamangalath A. Modified Hasson technique versus Veress technique: a comparative study. *Int Surg J* 2019;6:3246-50.