DOI: https://doi.org/10.53350/pjmhs221651027

ORIGINAL ARTICLE

Laparoscopic Port Insertion Modifications According to the Surgeons Competency

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ABSTRACT

Objective: The aim of current study is to determine the efficacy and safety of laparoscopic port insertion modifications according to the surgeons competency.

Study Design: Retrospective study

Place and Duration: Sir Ganga Ram Hospital Lahore. Jan-2019-July 2019

Methods: There were 88 patients of both genders were presented in this study. Patients were aged between 17-55 years. Data on the recruited patients' age, gender, and BMI were compiled after informed written permission was obtained. Indication of surgery was observed first and all of the patients were underwent for laparoscopic surgery port insertion either open or closed . Post-operative efficacy, complication and frequency of mortality was calculated within a duration of 2-months. SPSS 18.0 was used to analyze all data.

Results: Among 88 patients, 88 (54.4%) were males and 40 (45.6%) were females. The mean age of the cases were 35.14±11.34 years and had mean BMI 22.6±1.19 kg/m^2. Most common indication was inguinal hernia found in 35 (39.8%), appendicitis found in 28 (31.8%) patients, cholelithiasis in 15 (17.05%), varicocele in 6 (6.8%) and benign masses in 4 (4.5%) patients. In 70 (79.5%) patients laparoscopic closed technique was applied and 18 (20.5%) received open technique. Mean time of port insertion was 3.8±5.51 minutes in closed laparoscopy while in open laparoscopy mean time was 2.5±.4.31 minutes. Overall difficult entry was found among 20 (22.7%) cases. Post-operative rate of complications was found among 4 (4.5%) patients in which port site seroma, intraperitoneal injury and infection was the most common. No any mortality found in this study. Patients satisfaction rate was 80 (90.9%).

Conclusion: We concluded in this study that laparoscopic port insertion technique was an effective in terms of less operative time, surgeons competency, low rate of mortality and fewer post-operative complications among patients underwent for surgery with different type of diseases.

Keywords: Inguinal Hernia, Laparoscopic Port Insertion, Complications, Efficacy

INTRODUCTION

For abdominal surgery, laparoscopy is the preferred method. There are several advantages to laparoscopic surgery over open surgery, including faster healing, a shorter hospital stay, better cosmetic results, and a lower incidence of postoperative adhesions. [1] Laparoscopy, on the other hand, has a higher rate of first-port-injury-related morbidity and death than laparotomy. [1] Laparoscopy-induced intestinal damage has been shown to be 3.6 percent, despite the fact that all laparoscopy surgeons' primary priority is to avoid unnecessary harm at the initial port entrance. Although laparoscopy has a minimal risk of serious complications, some of the rarer ones that do occur may be fatal. [2] To avoid problems in laparoscopy, there has been a great deal of advancement in optics and electronics as well as other tools during the last two decades. Laparoscopy training facilities, seminars, and internet videos have also enhanced surgical competence and knowledge. These pointers assist in the adoption of helpful strategies for avoiding problems.

Multiple methods exist for inserting the initial abdominal port, but they all adhere to two basic principles: closed and open. Using the closed approach, a needle is inserted, insufflated, and a port is subsequently inserted. There is an increased risk of bladder and intestinal damage when using the closed approach. Hasson came up with the open approach in order to circumvent these issues. The abdominal cavity is opened in order to install the first port in the open procedure. A special cannula, a blunt obturator, and a trumpet valve with a sleeved sleeve are required for this procedure. The incision should only be large enough to provide visual access to the peritoneal cavity and dissection of the fascia. [3]

It's not always easy to create a pneumoperitoneum using a Veres needle during a closed laparoscopy. A subcutaneous emphysema or an anterior retroperitoneal gas collection might result if the needle is inserted too superficially during the injection. Any consequences, such as an omental emphysema or a visceral or vascular damage, may be caused by inserting the Veres needle too far into the abdominal cavity. There are a variety of tests available to establish the proper location for the Veres needle. Double-click testing, aspiration testing, and saline injection testing are among examples. Other tests include measuring intra-abdominal pressure (IAP) after inserting a Veres needle and measuring falling column and hanging drop pressure. However, until recently, these tests were not scientifically scrutinised, and it has been proven that several of these tests have low predictive value for accurate Veres needle insertion [4]. Veres needle insertion with minimal intra-abdominal pressure has been pronounced a favourable sign of proper needle placement by various authors [4,5].

In the gynaecological area, SPA surgery has been shown to have less postoperative discomfort than standard laparoscopy [6]. In addition, fewer trocars are placed with SPA surgery, which should lead to better aesthetic outcomes and fewer surgical problems linked to trocar insertion. [7] Systemic limitations of SPA surgery include instrument crashes or collisions between instruments and endoscopes, a limited number of instruments and camera platforms, and the limited mobility of straight laparoscopic instruments because of the single port through which surgical instruments are inserted into the patient's abdomen. Compared to traditional laparoscopy, these technological issues result in decreased accuracy and longer operating times. New devices, such as an angled laparoscope or instrument, have been devised to solve the technological problems.

The purpose of this study is to lay out the many considerations that go into doing laparoscopic surgery.

MATERIAL AND METHODS

This retrospective study was conducted at Sir Ganga Ram Hospital Lahore and comprised of 88 patients. Data on the recruited patients' age, gender, and BMI were compiled after informed written permission was obtained. To ensure the research was not

biassed, past abdominal surgery patients and those with insufficient data were ruled out.

Those patients who were scheduled for a laparoscopic operation of any kind were given a datasheet in the waiting area of the theatre. The patient's demographics, entrance data, and findings in the abdomen were gathered throughout the procedure. This laparoscopy was warranted, and previous abdominal procedures were recorded. The surgeon was required to document the following information during surgery: abdominal wall thickness ("thin," "normal," or "obese"), entry technique (Veres, Hasson, optical trocar, or a combination thereof), umbilical incision direction (transverse or longitudinal), location of the Veres needle (umbilical, suprapubic, or Palmer's point), number of attempts at insertion of the Veres needle and primary trocar, and entry verification tests (double cl) used (omentum, bowel). Only the surgeon's degree of training, from senior house officer to consultant, was used to identify the surgeon. Patients did not get any postoperative follow-up care. The completed datasheet was stored in a sealed box in the operation room once it had been completed. We gathered data sheets on a weekly basis.

Post-operative efficacy, complication and frequency of mortality was calculated within a duration of 2-months. SPSS 18.0 was used to analyze all data.

RESULTS

Among 88 patients, 88 (54.4%) were males and 40 (45.6%) were females. The mean age of the cases were 35.14±11.34 years and had mean BMI 22.6±1.19 kg/m^2. Most common indication was inguinal hernia found in 35 (39.8%), appendicitis found in 28 (31.8%) patients, cholelithiasis in 15 (17.05%), varicocele in 6 (6.8%) and benign masses in 4 (4.5%) patients.(table 1)

Table-1: Detailed demographics of enrolled cases

Variables	Frequency	Percentage
Mean age (years)	35.14±11.34	
Mean BMI (kg/m^2)	22.6±1.19	
Indication of Surgery		
inguinal hernia	35	39.8
appendicitis	28	31.8
cholelithiasis	15	17.05
varicocele	6	6.8
benign masses	4	4.5

In 70 (79.5%) patients laparoscopic closed technique was applied and 18 (20.5%) received open technique.(fig 1)

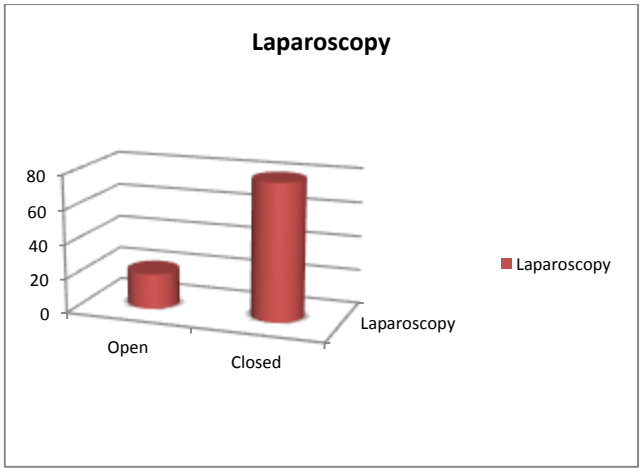

Figure-1: Distribution of cases with type of laparoscopy

Mean time of port insertion was 3.8±5.51 minutes in closed laparoscopy while in open laparoscopy mean time was 2.5±.4.31 minutes. Overall difficult entry was found among 20 (22.7%) cases.(table 2)

Table-2: Comparison of port insertion time and difficulty among cases

Variables	Closed (70)	Open (18)
Mean time (minutes)	3.8±5.51	2.5±.4.31
Difficulty in Port insertion		
Yes	8 (9.1%)	12 (13.6%)
No	62 (70.4%)	6 (6.8%)

Post-operative rate of complications was found among 4 (4.5%) patients in which port site seroma, intraperitoneal injury and infection was the most common. No any mortality found in this study. Patients satisfaction rate was 80 (90.9%). (table 3)

Table-3: Post-operative complications and satisfaction

Variables	Frequency	Percentage
Complications		
Yes	4	4.5
No	84	94.5
Type of Complications		
port site seroma,	2	2.3
intraperitoneal injury	1	1.1
infection	1	1.1
Satisfaction		
Yes	80	90.9
No	8	9.1

Transverse umbilical incision was not related with a non-confirmatory test, repeated Veres needle enters, or an aberrant entrance finding compared to a longitudinal umbilical incision. According to the surgeon's level, entrance problems as characterized by repeated tries at Veres needle, primary trocar insertion, and conversion from Veres to Hasson entry happened considerably more often in the younger surgeons (p = 0.08).(table 4)

Table-4: Numerous Veres needle or main trocar insertions or a switch to open entry or laparotomy due to difficulties of entrance

Variables	Frequency	Percentage
>1 primary trocar insertion	7	7.9
>1 Veres entry	15	17.04
Conversion from Veres to Hasson entry	3	3.4

DISCUSSION

In laparoscopic general surgery, the blind Veress needle/trocar insertion and the open trocar placement under direct visualisation are the two most common techniques used to enter the peritoneal cavity.. Operative laparoscopy may result in deadly consequences, such as subcutaneous emphysema and gas embolism, when the pneumoperitoneum is created, and when the Veress needle or the first laparoscopic trocar is inserted into a patient's abdomen. [8,9] New procedures, protocols, and technology have been developed during the last two to three decades to eliminate the dangers associated with the initial port entrance in laparoscopy. There has been no one instrument or procedure that has attained the goal. [10]

In this prospective study 88 patients were presented. Among 88 patients, 88 (54.4%) were males and 40 (45.6%) were females. The mean age of the cases were 35.14±11.34 years and had mean BMI 22.6±1.19 kg/m^2. Most common indication was inguinal hernia found in 35 (39.8%), appendicitis found in 28 (31.8%) patients, cholelithiasis in 15 (17.05%), varicocele in 6 (6.8%) and benign masses in 4 (4.5%) patients. Results of current study was comparable to the previous study.[11,12] In 70 (79.5%) patients laparoscopic closed technique was applied and 18 (20.5%) received open technique. Mean time of port insertion was 3.8±5.51 minutes in closed laparoscopy while in open laparoscopy mean time was 2.5±.4.31 minutes. In previous study same results were presented.[13]

Transverse umbilical incision was not related with a non-confirmatory test, repeated Veres needle enters, or an aberrant entrance finding compared to a longitudinal umbilical incision. According to the surgeon's level, entrance problems as characterized by repeated tries at Veres needle, primary trocar insertion, and conversion from Veres to Hasson entry happened considerably more often in the younger surgeons ($p = 0.08$). Open (Hasson) vs closed (Veres) entrance has not been conclusively proved to be better. As fewer stages are required in the entrance procedure, there may be a lower risk of entry damage with direct entry, according to data on laparoscopic injury rates with this technique. In our research, the median number of tests done was five, and surgeons often used numerous tests to verify that the Veres needle was correctly placed. At least one entry verification test failed in one in every 18 (20.4 percent) cases. If the Veres needle was correctly positioned in at least 85% of the instances where it was seen as a visual confirmation of misplacement, the entrance tests were able to accurately determine the needle's right position. Even when all entrance tests were found to be valid, 22.7 percent still had an aberrant entry finding even though all tests were considered to be valid. These findings might be explained by the injection of saline or inhalation of carbon dioxide gas forcing a Veres needle out of its wrong position in the omentum. Alternatively, the surgeon raising the front abdominal wall after displaying an initial high pressure, with subsequent normal pressures, might explain this complication, as well. This may be due to the use of too little anaesthesia, which should be rectified before to the next Veres needle insertion. This is a very frequent and valuable marker of proper Veres needle placement, however we eliminated it from our study. An error occurred because of a lack of attention paid to the practicality of the Veres needle test procedures.[14,15]

Post-operative rate of complications was found among 4 (4.5%) patients in which port site seroma, intraperitoneal injury and infection was the most common. No any mortality found in this study. Patients satisfaction rate was 80 (90.9%). Many previous studies presented same findings to our research.[16-18]

In our research, we found that the Veres (closed) laparoscopic entrance method was preferred over the Hasson (open) laparoscopic approach. For the Veres needle, commonly utilised entrance assays are precise but not sensitive. As a result, we advise gynaecological surgeons to continue using a variety of entry tests during closed laparoscopic entry in order to reduce the risk of an initial Veres needle misplacement.

CONCLUSION

We concluded in this study that overall laparoscopic port insertion both techniques was an effective in terms of less operative time, surgeons competency, low rate of mortality and fewer post-operative complications among patients underwent for surgery with different type of diseases.

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