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## THE FREQUENCY OF COMMON COMPLICATIONS OF VERESS NEEDLE IN LAPAROSCOPIC CHOLECYSTECTOMY

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### ABSTRACT

#### METHODOLOGY

The study was conducted in department of surgery, Lady Reading Hospital Peshawar within six months and it was descriptive cross sectional study. In this study a total of 177 patients were observed. The age ranges were 21 to 65 years and male to female ratio was 1:2. The most common complication was abdominal wall hemorrhage in 22% patients while 18% patients had omental injury. The abdominal wall emphysema was observed in 10% patients.

#### OBJECTIVE

To determine the frequency of common complications of Veress Needle used for creating pneumoperitoneum in laparoscopic cholecystectomy

#### CONCLUSION

Our study showed that veress needle technique is safe, easy and cost effective for primary access to create pneumoperitoneum.

#### KEY WORDS

Complications, Veress Needle, Pneumoperitoneum, Laparoscopic Cholecystectomy

### INTRODUCTION

In laparoscopy, the establishment of pneumoperitoneum requires the introduction of a sharp insufflating needle or trocar<sup>1</sup>. Complications arising from laparoscopic surgery are rare and commonly occur when attempting to gain access to the peritoneal cavity<sup>2</sup>. Creation of the pneumoperitoneum is the first and most critical step of a laparoscopic procedure because that access is associated with injuries to the gastrointestinal tract and major blood vessels and at least 50% of these major complications occur prior to commencement of the intended surgery. This complication rate has remained the same during the past 25 years<sup>3</sup>. The number of vascular complications/injuries in laparoscopic surgery is 2 in 10,000 procedures. Despite of decades passed and lot of studies done, there is no clear consensus on portal of entry for laparoscopic surgery<sup>4</sup>.

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Some studies have shown that almost 50% of complications in laparoscopic surgery are related to primary access<sup>5, 6</sup>. The visceral injury can occur during introduction of veress needle. Visceral injuries may be evident per operatively or may remain unrecognized during operations and later manifest as peritonitis, abscesses or sepsis<sup>7</sup>. The present study is designed to determine the frequency of common complications observed after using Veress needle. Despite of its common utilization in laparoscopic cholecystectomy( LC) in our populations, no study has been done to see the magnitude of its complications. This study will be first of its kind in our population undergoing LC with Veress needle being used for primary access. The results of this

study will be crucial in getting fresh local data and in light of these results we will be able to draw future research strategies. There are several methods of intra-abdominal entry. There is no advantage of one over the other; and therefore, no clear consensus concerning the optimal method of entry exists.<sup>8</sup> DTI(direct trocar insertion) and Visual entry cannula system represents an advantage over the traditional trocars as there are less gas related complications and allows clear visual entry respectively. However, evidence is lacking concerning its superiority over the traditional trocars as there are less gas related complications and allows clear visual entry respectively. However, evidence is lacking concerning its superiority over the traditional trocars, especially in avoiding visceral and vascular injuries.<sup>9</sup> VNI(veress needle insertion) at Palmer's point needs to be considered in patients suspected or known periumbilical adhesions or umbilical/para umbilical hernia or after three failed attempts of VNI through SUF(supra umbilical fold) in midline. Palmer's point and SUF in the midline are equally safe and effective for VNI.<sup>10</sup> However, a recent and comprehensive audit reveals that VNI at SUF in midline 'poses serious risk to the life of patients', thereby justifying further studies to find alternate sites for VNI.<sup>11</sup> The thickness of the skin fold is an important factor in deciding the success of the VNI at alternate site. Which is the least at LICS(lower inter costal space) and maximum at SUF. VNI through LICS is also confirmed to be a safe and good option in cases with suspected intra-abdominal adhesions.<sup>12</sup> Decompression of the stomach by orogastric tube is mandatory before using this technique.<sup>13,14</sup>

## METHODOLOGY

The study was conducted in surgery department Lady Reading Hospital. The duration was six months and it was a descriptive cross sectional study. Sample size was 177 keeping 8% proportion of abdominal wall injuries after using veress needle for LC, 95% confidence interval and 4% margin of error using WHO sample size calculator.

**Inclusion Criteria:** All patients undergoing laparoscopic cholecystectomy for cholelithiasis, ASA class 1 and 2, both genders (range, 14-65 years).

**Exclusion Criteria:** Patients with Co-morbid diseases that are contra-indication for laparoscopic surgery. The above mentioned conditions act as confounders and if included had introduce bias in the study results.

## DATA COLLECTION PROCEDURE

The study was conducted after approval from hospitals ethical and research committee. All patients meeting the inclusion criteria were included in the study admitted through OPD for laparoscopic cholecystectomy. The purpose and benefits of the study was explained to the patients and they were assured of the research purpose and a written informed consent was obtained.

Complete history, general physical and relevant anesthesia fitness examination was done. All the laparoscopic cholecystectomies were conducted by single experienced laparoscopic surgeon and all the patients were monitored throughout surgery for recording complications of veress needle like abdominal wall emphysema, abdominal wall hemorrhage and omental injury. All the above mentioned information including name, age, gender and address was recorded in a predesigned proforma. Strictly exclusion criteria had followed to control confounders and bias in the

study results. Data was stored and analyzed in SPSS version 17. Mean  $\pm$  SD was calculated for quantitative variables like age. Frequencies and percentages were calculated for categorical variables like gender and common complications (abdominal wall emphysema, abdominal wall hemorrhage and omental injury). Common Complications were stratified among age and gender to see the effect modification. All results were presented in the form of tables and graphs.

## RESULTS

A total of 177 patients were observed to determine the frequency of common complications of veress needle used for creating pneumoperitoneum during laparoscopic cholecystectomy and the results were analyzed as: Age distribution among 177 patients was analyzed as 26(15%) patients were in age range 21-30 years, 57(32%) patients were in age range 31-40 years, 50(28%) patients were in age range 41-50 years, 44(25%) patients were in age range 51-65 years. Mean age was 40 years with SD  $\pm$  11.34. Gender distribution among 177 patients was analyzed as 62(35%) patients were male and 115(65%) patients were female.

Frequency of common complications among 177 patients was analyzed as 18(10%) patients had abdominal wall Emphysema, 39(22%) patients had abdominal wall hemorrhage and 32(18%) patients had omental Injury.

**TABLE NO 1: AGE DISTRIBUTION (n=177)**

AGE	FREQUENCY	PERCENTAGE
21-30 years	26	15%
31-40 years	57	32%
41-50 years	50	28%
51-65 years	44	25%
<b>Total</b>	<b>177</b>	<b>100%</b>

Mean age was 40 years with SD  $\pm$  11.34

**TABLE NO 2: GENDER DISTRIBUTION (n=177)**

GENDER	FREQUENCY	PERCENTAGE
Male	62	35%
Female	115	65%
<b>Total</b>	<b>177</b>	<b>100%</b>

**TABLE NO 3: COMMON COMPLICATIONS (n=177)**

COMMON COMPLICATIONS	FREQUENCY	PERCENTAGE
Abdominal Wall Emphysema	18	10%
Abdominal Wall Hemorrhage	39	22%
Omental Injury	32	18%
<b>Total</b>	<b>177</b>	<b>100%</b>

## DISCUSSION

The Veress needle is inserted blindly into the abdomen, which increases the risk of iatrogenic injury. "Without any doubt, the most dramatic event a surgical team can experience is major vascular injury.<sup>15</sup> It is difficult to determine the exact prevalence of iatrogenic injury during

laparoscopy because certain complications are not usually reported,<sup>16,17</sup> for obvious reasons. Our study shows that 15% patients were in age range 21-30 years, 32% patients were in age range 31-40 years, 28% patients were in age range 41-50 years, 25% patients were in age range 51-65 years. Mean age was 40 years with SD  $\pm$  11.34. Thirty five percent patients were male and 65% patients were female. More over 10% patients had abdominal wall Emphysema, 22% patients had abdominal wall hemorrhage and 18% patients had omental Injury.

Similar results were found in study conducted by Rohatgi A et al<sup>18</sup> in which 10% patients were in age range 21-30 years, 33% patients were in age range 31-40 years, 30% patients were in age range 41-50 years, 27% patients were in age range 51-65 years. Mean age was 42 years with SD  $\pm$  12.11. Thirty percent patients were male and 70% patients were female. More over 15% patients had abdominal wall Emphysema, 27% patients had abdominal wall hemorrhage and 23% patients had omental Injury. In another study, abdominal wall hemorrhage was seen in 8% of patients<sup>1</sup>. However, another study reported by Misro AK et al reported no complications with closed method of trocar insertion using veress needle<sup>7</sup>. In another study, the overall complications rate observed using veress needle were 9%<sup>19</sup>. In study done by Kaloo P et al<sup>20</sup> 3.7% cases were considered major injuries, with 42 vascular injuries (71.2%) and 17 (2.8%) bowel injuries of both the small and large intestines. Although the incidence of bowel and retroperitoneal vascular injuries during blind insertion of the Veress needle is low (1 in every 11,805 needle insertions), such accidents should not be dismissed because they are potentially fatal if undetected. However, the prognosis is good when they are detected quickly and treated properly. In study done by soong YK et al<sup>21</sup> the major injuries, all reports specified the site of injury and 70.6% of the studies reported the outcome of the case. The studies reviewed for injury to hollow viscera caused by the Veress needle are very homogeneous with regard to the site of the injury (28.6% occurred in the large intestine, 32.1% in the small intestine, and 32.1% in the stomach). However, when the outcomes of the cases were analyzed, we noticed that among the injuries to the large intestine, two developed into peritonitis, sepsis, multiple laparotomies, and considerably longer hospital stay; three others were repaired by laparotomy. All laparoscopic procedures during which injury to the small intestine occurred, and whose outcomes were documented, were converted to laparotomies, with reports of enterectomy.

Considering that the closed technique using a Veress needle has advantages over other methods of creating pneumoperitoneum, e.g., it is easier to perform, it takes less to create a pneumoperitoneum, and there is less gas leakage, further studies should be carried out to investigate alternative sites for Veress needle insertion, as most studies currently found in the literature have used insertion sites in the midline. Some of these studies have used other insertion sites such as Palmer's point<sup>18</sup> in patients who have undergone previous abdominal surgery because of the higher incidence of peritoneal adhesions in these patients, in obese patients, or in very thin patients because of the short distance between the abdominal wall and the retroperitoneal vessels. However, it is rarely described in the literature how many patients have undergone Veress needle insertion into alternative sites. This makes it impossible to use this information as an inclusion or an exclusion criterion for analysis. Gulogly R et al<sup>22</sup> did not cause any injuries in any of the 17 cases in which the Veress needle was inserted at Palmer's point. There are very few studies in the literature that exclusively investigate alternative sites for Veress needle insertion. Leonard et al.<sup>23</sup>

performed 117 needle insertions in the left upper quadrant, with no accidents. The insertion of the Veress needle into a site other than the midline, e.g., Palmer's point, left upper quadrant of the abdomen, can reduce the risk of injury during the creation of pneumoperitoneum in laparoscopic procedures.

## CONCLUSION

Based on the above mentioned discussion we conclude that the Veress needle technique of primary access is quiet comparable or even superior to open one in terms of primary access related complications. It is recommended that Veress needle technique is still a safe, easy and cost effective technique, but surgeon must continue with the primary access technique in which they feel more comfortable and confident.

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