

## A Study of Intraoperative Complication of Port Entry Techniques in Gynaecological Laparoscopic Surgery

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### Abstract

**Background:** Over the last decade, a rapid increase has occurred in both the applications of operative laparoscopy and the number of surgeons using this technique. Although the complications of operative laparoscopy are low, they can be severe and life-threatening. The purpose of this study is to observe the major and minor complications of veress needle entry versus direct trocar for laparoscopy surgeries.

**Method:** A retrospective study was carried out during the period of January 2022 and June 2022 among the 50 patients coming to Obstetrics & Gynaecology department at C.U. Shah Medical College in which Veress Needle entry (VN) vs direct trocar entry (DT) method was used to create pneumoperitoneum in laparoscopic surgery. All data collected from medical record charts, patient details, clinical presentations and Ethical approval was obtained from ethical committee of institution.

**Result:** Total duration of procedure (min) in VN Group was  $5.1 \pm 1.2$  and in DT Group it was  $4.3 \pm 1.3$ , while amount of gas used for pneumoperitoneum in litre was  $5.6 \pm 0.8$  in VN group and  $4.1 \pm 0.6$  in DT Group analysis shows in VN Group local site complication like port site leakage are seen in 12 patients, extra peritoneal insufflations seen in 6 patient, entry in wrong plane were found in 3 patient while loss of space was seen among 5 patients. In case of DT Group port site gas leakage was seen in 18 patients, extra peritoneal insufflations were found in 2 cases, entry in wrong plane was 1 and loss of space was in 1 patient. In systemic complication such as vascular injury only one and omental injury 2 cases were reported, and Nil cases were found in bowel trauma and gas embolism in VN Group. while DT Group vascular injury and gas embolism were nil. Bowel injury and omental injury were in 2 patient and in 5 patients.

**Conclusion:** Direct Trocar entry is a safe alternative to the Veress needle entry technique for the creation of pneumoperitoneum. One of the main advantages of this technique is the reduced number of the blind insertions required to gain abdominal access. Other benefits are rapid creation of pneumoperitoneum, less gas use and decreased operating time.

**Keywords:** Veress needle, direct tracer entry, pneumoperitoneum, laparoscopy.

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## Introduction

This study is an examination of the safety and efficiency of the verses Needle entry vs. direct trocar entry method used to create pneumoperitoneum in laparoscopic surgery. Ever since the first laparoscopy performed by Jacobeus of Sweden in 1925, different techniques, technologist and evidence-based guidelines have been introduced to eliminate the risk associated with laparoscopic entry, whatever be the method of adopted for first port entry into the abdomen. From studies, it is proved that 50% of laparoscopic surgeries, major complications occur prior to commencement of surgery and there is delay in diagnosis of visceral injury will lead to increase morbidity and mortality [1]. Recent years, minimally invasive operational techniques have slowly taken over as the preferred technique and enjoys vast popularity in patients and surgeons.

Despite tremendous advances in newer techniques and instrumentation, some complications specifically related to the laparoscopic surgery need to be considered with the utmost attention. The complications, such as vascular or visceral injuries that occur during the first blind Veress needle or primary trocar insertion, are completely unknown in conventional open procedures. The most concerning issue is that though the incidence of these catastrophic complications is very low (.05%) but mortality ranges between 8% and 17%. [2,3,4] Many authors have expressed the degree of perplexity above the reliability of these figures and consider the incidence of major vessel injury to be underestimated as it might be grossly under-reported [5,6,7,8]. Still, the incidence over so many years has remained unchanged, irrespective of all innovations to make laparoscopic entry safer, and these have found no correlations with the severity of procedures.

## Aims and Objective

1. To determine complications in veresse needle entry.
2. To determine complications in direct port entry.

## Material and Method

All data was analysed during the period of January 2022 and June 2022. Total 50 patient's data was studied in Obstetrics & Gynaecology department of C.U. Shah Medical College in which verses Needle entry or direct trocar method was used for entry in abdomen to create pneumoperitoneum in laparoscopic surgery. The results were compared with those reported in the literature in terms of reliability and efficiency. Inclusion criteria: patients undergoing tubal ligation by laparoscopic method in department of Obstetrics & Gynaecology at C.U. Shah Medical College. Exclusion criteria: laproscopic operations other than tubal ligation. Techniques to create pneumoperitoneum by Veress needle or direct trocar entry were surgeon's choice in each case.

Veress needle entry (VN group): Patients in VN (Veress needle technique) group had undergone laparoscopic surgery after trocar placements after insufflation by direct entry with verses needle. Patient was given supine position; a small stab incision was made at the desired site. Veress needle was introduced at a 45° angle toward the pelvis. Two "pops" from the fascia and peritoneum were heard before entering the abdominal cavity. The needle was aspirated and intra peritoneal location was verified with the saline drop test before initiating insufflations into peritoneal cavity at a pressure of 12-14 mmHg. After this, other trocars were inserted under vision.

**Direct trocar entry (DT group):** Patients in this group patient had undergone laparoscopic surgery after trocar placement

by direct trocar insertion technique. The patient was placed in a supine position. A 10 to 12 mm transverse incision was given supra umbilically or infra umbilically. Abdominal wall was elevated with towel

clamps and the trocar was inserted into the abdominal cavity, turned 30 degrees to the horizontal and directed towards the pelvis.

## Results

**Table 1: Total duration of procedure (min) and Gas used (litre)**

N=50	Veress Needle entry (VN) group	Direct primary trocar entry (DT) group
Total duration of procedure (min.)	5.1± 1.2	4.3±1.3
Gas use (litre)	5.6±0.8	4.1±0.6

In table 1, total duration of procedure(min.) was 5.1± 1.2 in VN group and it was 4.3±1.3 in DT group. Amount of gas used for pneumoperitoneum in litre was 5.6±0.8 in VN group and 4.1±0.6 in DT group.

**Table 2: Port site complication**

Port site complication N=50	Veress Needle entry (VN) group	Direct primary trocar entry (DT) group
Port site gas leakage	12	18
Extra peritoneal insufflations	6	2
Multiple attempts	16	3
Entry in wrong plane	3	1
Loss of space	5	1

Table 2 shows that in VN group port site leakage, extra peritoneal insufflations, multiple attempts 12,6,16 and entry in wrong plane, loss of space were 3, 5 out of 50 patients. In DT group port site leakage, extra peritoneal insufflations, multiple attempts were 18,2,3 and entry in wrong plane, loss of space were 1, 1 out of 50 patients.

In Table 3, vascular injury was 1 and omental injury was 2 in VN group, and it was 0 and 5 in

DT group out of 50 patients. Bowel injury and gas embolism were 0 in VN group while in DT group it was 2 and 0 out of 50 patients

**Table 3: Organ site injury**

Organ injury N=50	Veress Needle entry (VN) group	Direct primary trocar entry (DT) group
Vascular injury	1	0
Bowel injury	0	2
Omental injury	2	5
Gas embolism	0	0

## Discussion

Over the last two decades, rapid advances have made laparoscopic surgery a well-established procedure. However, because laparoscopy is relatively new, it still arouses controversy, particularly with

regard to the best method for the creation of the pneumoperitoneum. Traditional closed method of pneumoperitoneum involves initial blind entry into abdomen, and more than half of such injuries are related to this primary blind access and occur before the start of actual anatomic dissection. 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 occurs prior to commencement of the intended surgery.

Regardless method used, gaining access to the abdomen and initiating pneumoperitoneum remains a source of morbidity and mortality with most common complications being visceral and vascular injuries. The incidence of complications of procedure might appear insignificant in consideration of the large number of procedures carried out worldwide, but the sudden catastrophic episode could be unnerving for all present in the theatre. Such episodes have long-term legal implications which may be sorted out, but their mental imprint can scar a novice surgeon for life. Direct trocar insertion was first reported in the literature by Ding folder [9] in 1978. They found a statistically significant in Port site complications and longer insertion time in the Veress needle group.[10]

According to Zakherah MS [11] direct trocar group had only 2% of patients who underwent multiple attempts in contrast to Veress needle group where it was 14%. In the present study the duration of the procedure was comparatively shorter in direct primary trocar entry group than Veress needle group and Multiple attempts at insufflations and extra peritoneal insufflations were more common in the VN group than DT group which is very much in accordance with Zakherah MS[11] Inan et al[12] and Preto-Diaz Chavez et al.[13] In the present study, there are no major complications encountered which is in close agreement with Theodoropoulou et al.[14]

### Conclusions

Direct Trocar entry is a safe alternative to the Veress needle entry technique for the creation of pneumoperitoneum. One of the main advantages of this technique is the

reduced number of the blind insertions required to gain abdominal access. Other benefits are rapid creation of pneumoperitoneum, less gas use and decreased operating time. In laparoscopic surgeries, it is a more reliable and less time-consuming method.

In the end, every surgeon should assess his own experience and in the light of this experience decide which is the best method for him to establish pneumoperitoneum taking into account the particular clinical situation and his own proficiency in each of the specific techniques.

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