



Direct Primary Trocar Entry for Laparoscopic Procedures: our Experience

KEYWORDS

Laparoscopy, Veress Needle, Direct Trocar Entry.

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ABSTRACT

In laparoscopic surgery the most important step is placement of primary port. Many complications like vessel injury, subfascial gas insufflations are known to occur at this step. Two techniques commonly used for port entry, are closed technique and open (Hasson's) technique for access to the abdominal cavity. We have analyzed laparoscopic operative cases done by direct trocar entry in our hospital in last seven years. Our results showed no morbidity or mortality in the study. Only 40 (4.27%) cases required more than two attempts for the trocar entry. There were only two cases of omental injury. No vascular injury or subcutaneous gas insufflations noted. These results were similar to other authors. From this study we conclude that direct trocar entry is a safe & easy technique for first port placement in laparoscopic surgeries.

Introduction: Minimal access laparoscopic surgery is worldwide accepted method. in Gynecology. The technique of safe placement of primary port for gaining access to abdominal cavity is learnt while doing diagnostic procedures & while doing laparoscopic tubal ligation¹. The success of surgery depends on safe and correct primary port entry to create pneumoperitoneum². The different techniques used for first port entry are using 1) Veress needle (classic closed technique), 2) Direct trocar entry (DTE) without pre insufflation, 3) Open technique (Hasson's technique), & 4) Optical trocars³. Since many years creating pneumoperitoneum with Veress needle & then insertion of primary trocar from umbilical port (3 steps) is the common practice by Gynecologists. Significant complications like subcutaneous or subfascial insufflation, gas embolism, and visceral injury are associated with Veress needle technique². Worldwide complication rate ranges from 0.05% to 14%³.

The direct trocar entry method was introduced in 1978 by Dingfelder, which shortens the time span; chances of injury and failure are less⁴. Dingfelder believed that abdominal wall elevation is better without creating pneumoperitoneum². In our hospital we are practising direct trocar insertion for first port entry. We have analyzed direct trocar entry route done in cases of laparoscopic procedures in last seven years.

Material & Method: Out of total 980 cases 935 were done by direct trocar entry & 45 cases were done by open technique (Hasson's technique) in last seven years. As the number of cases done by open technique is small we have not done the comparative analysis. Laparoscopic procedures done by consultants & by postgraduate students under supervision where first port entry was by direct trocar entry were analyzed. Once patients were fit, consent was obtained & preparation was done, they were subjected for laparoscopy by direct trocar entry under General Anesthesia. After induction of anesthesia patients were put in modified Lloyd David position, painting draping was done & uterine manipulator was positioned in uterine cav-

ity. Anatomical land marks like aortic pulse, iliac spines were identified. A 10 mm horizontal infraumbilical incision was taken. The lower abdomen was grasped with left hand midway between the umbilicus and pubic symphysis, and elevated. With elevation of the abdominal wall, a 10 mm. Trocar and Sleeve was slowly inserted directly through the incision using a twisting motion with index finger as guard with the tip of trocar aimed towards the uterus. While inserting trocar with sleeve patients BMI was taken into consideration and angle at which trocar was inserted maintained. As the trocar & canula passed through the peritoneum, sudden loss of resistance was noticed, hiss of gas passing through sleeve heard on withdrawing trocar. The laparoscope was then introduced with the light on; the proper intra-abdominal placement was confirmed. Once the entry was confirmed, then pneumoperitoneum was established & the operative procedure was continued. In 45 patients Open technique was used as these patients had undergone two or more abdominal surgeries mainly by vertical incision.

Results: We have considered total 935 cases of laparoscopy where first port entry was done by direct trocar entry in last 7 years from 2006 to 2013.

Table 1: Distribution of cases according to previous abdominal operative history out of total 980 cases:

Number of surgeries	Patients number	percentage
No previous surgery	746	76.12%
One	130	13.26%
Two or more previous surgeries cases done by direct trocar entry	59	6.02 %
Two or more previous surgeries cases done by open technique	45	4.59%

Table 1 shows that 13.26% patients had undergone previous one surgery & 6.02% patients had undergone previous two or more surgeries, these were the patients in high risk group as far as the complications of direct trocar entry are taken into consideration.

Table 2 : Patient distribution according to BMI & number of attempts of direct primary trocar entry:

BMI	No. Of Cases	Percentage	Number of cases of more than one attempts for trocar entry
18--25	477	51.01 %	5
25--30	356	38.07 %	35
30--35	102	10.90 %	8

Table 2 shows that only 10.90% patients were obese and about 51 % patient were averagely built. In overweight & obese patients more attempts for trocar entry were required. In healthy individuals in 5 patients primary trocar entry was not possible in first attempt as these were done by postgraduate students. In obese patients in only 8 cases out of 102 two attempts were required for trocar placement as these cases (obese) were done mainly by senior consultants.

Table 3: Level of competency & number of attempts of trocar entry:

Surgeon	Number of cases	Number of attempts	percentage
Consultant	8	two	0.85%
Resident	40	Two or more	4.27%

Table 3 shows that level of competency increases with practice. Resident doctors required more attempts for trocar placement as the correct angle of insertion was not maintained while entering the trocar.

Table 4: Complications seen:

Factor	No. of cases	Percentage
Subcutaneous emphysema	0	0 %
Vascular injury	0	0 %
Omental injury	2	0.21 %

From table 4 we can see that complications like subcutaneous emphysema or vascular injury were not seen in our study. The omental injury was seen in 0.21 % (2 cases) of cases. Out of these two cases one was with previous one caesarean section with vertical abdominal incision, and other was with previous two caesareans with transverse incisions. In both cases minimal bleeding was noticed which stopped on its own & no further surgical intervention was required.

Discussion:

The different techniques for first port placement are available but none is complication free & completely safe. As the endoscopic approach is being used more freely for operative procedures in gynecology one has to get used to safer technique. Copland et al state that Direct trocar entry requires adequate anesthesia for proper relaxation, adequate incision length, & sharp trocars⁴ are mandatory. Correct angle of insertion which needs to be maintained

throughout till you enter the abdominal cavity⁴.

In open comparative randomized prospective study in 598 no obese patients, DTI (Direct trocar insertion) was feasible in 100% of patients versus 98.7% in the VN (Veress needle) group. Minor complications were nil in the DTI group and 5.9% in the VN group ($p < 0.01$). Major complications were nil in the DTI group and 1.3% among VN patients⁵. Kittinan Thisariwong used direct trocar insertion technique in 91 patients in his study and has recorded no major or minor complications². Similarly in our study also no morbidity & mortality was recorded. Jacobson et al in their retrospective study on 1385 patients of three entry techniques found one minor bowel injury, and no vascular injuries either in veress needle group or direct trocar insertion technique⁶. In a study conducted by Krishnan Kapur direct trocar insertion was used in 2958 patients and no major or minor complications were found; and no case required more than three attempts⁷. Prieto-Diaz-Chavez et al & Mehmeli Ali Verdel et al reported low complication rates for direct trocar insertion group as compared to Veress needle group in their studies⁴. Byron et al. used the direct entry technique on an unselected group of 937 women. Byron et al reported more than three attempts to enter the abdomen in 2.7% of cases, failed technique in 1.4%, and a total complication rate of 4.2% (39/937) with a significant increased risk of minor complications ($P < 0.001$)⁹.

Our results are also similar no major complications were recorded. Only in 0.21% of patients omental injury occurred which did not require further intervention. Only 40 patients (4.27%) required more than 2 attempts for primary port placement. In the metaanalysis conducted in Laparoscopic Entry Techniques (Review), Ahmad G, Duffy JMN, Phillips K, Watson A, no major difference was found in complications in comparison of direct trocar entry with veress needle group, but extra peritoneal gas insufflation was avoided in DTI group⁸. No complications were recorded in open versus direct trocar entry group⁸. Our findings are also similar no extra peritoneal gas insufflation found or vascular injury recorded. In safe laparoscopic access Author Niraj Mahajan states that time consumed for DTI was 2.2 minutes & for primary port entry using Veress needle was done in 5.9 minutes.; Byron JW et al operated with these two techniques and commented that Veress needle group required four minutes more³ than DTI group.; this shows that Direct trocar entry technique for first port placement requires shorter duration of time as compared to port placement using veress needle. We cannot comment on time in our study as Veress needle was not used.

Conclusion:

From these findings we will like to conclude that direct trocar entry is a safe & easy technique even in hands of juniors under supervision. But further study for comparison of Veress with Direct Trocar Entry is required to find the difference in duration required. We also feel the technique should be tried in more number of obese patients to test safety in them.

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