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Research Article

DIRECT TROCAR VERSUS VERESS NEEDLE FOR CREATION OF PNEUMOPERITONEUM DURING DIAGNOSTIC LAPAROSCOPY IN PATIENTS WITH INFERTILITY

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ABSTRACT

Objective: To compare direct trocar and veress needle technique for creation of pneumoperitoneum during diagnostic laparoscopy in infertile patients with regard to safety and duration of procedure.
Methods: Retrospective study was conducted from march 2013 to April 2018 and two hundred diagnostic laparoscopies done by single surgeon for infertility evaluation including 100 cases done between march 2013 to janurary 2016 by veress needle and 100 cases done between feburary 2016 to april 2018 by direct trocar for creation of pneumoperitoneum in five private hospitals of Kashmir valley.
Results: Procedure was quick with direct trocar (3.8±0.5 min.) compared to veress needle technique (6.2± 1.0 min.). The complications like conversion to open surgery, port site bleeding, preperitoneal emphysema, omental bleeding and port site endometriosis were more common with veress needle as compared to direct trocar technique.
Conclusion: Direct trocar insertion is rapid and safe as compared to veress needle for creation of pneumoperitoneum.

INTRODUCTION

The laparoscopic access for pelvic surgeries is now state of art, however, acceptance of these surgical access routes and their incorporation in daily gynecologic practice has been slow and took over two decades. Gaining access to create space for operability with gas (pneumoperitoneum) is first step in minimal access surgery.[1,2] The techniques for creating pneumoperitoneum are both closed and open. In closed technique the pneumoperitoneum is created by veress needle or by direct trocar access. The Veress needle for establishing pneumoperitoneum is very common technique used by gynaecologists and general surgeons, [3] However it is associated with complications like preperitoneal insufflation, subcutaneous emphysema, failed placement and can provoke major and minor visceral injuries,[4, 5] therefore direct trocar insertion technique for pneumoperitoneum creation has been shown to be safe and efficient alternative technique especially for lean and non-obese patients. [6]

Aims and objectives

To compare safety of direct trocar and veress needle technique for creation of pneumoperitoneum during diagnostic laparoscopy in infertile patients.

MATERIAL AND METHODS

Retrospective study was done from march 2013 to april 2018 and all the 100 diagnostic laparoscopies done for infertility evaluation using infraumblical direct trocar technique between feburary 2016 and april 2018 in five private hospitals of Kashmir valley by single surgeon were compared for safety profile with 100 diagnostic laparoscopies done using infraumblical verees needle for pneumoperitoneum creation between march 2013 and janurary 2016 by same surgeon. In direct trocar technique 11mm vertical incision was made starting from inferior crease of umbilicus, abdominal wall was lifted by surgeons left hand and 10mm trocar with stopcock open was introduced directly by right hand screwing movements with direction of trocar towards anus. As soon as peritoneal penetration was perceived, the trocar was withdrawn and telescope introduced to confirm correct placement.

Inclusion criteria

All the Women with primary and secondary infertility.
Age range between 18 and 45 years.
Body mass index between 18 and 25.

Exclusion criteria

All the women with previous abdominal and pelvic surgeries.
Women with uncorrected coagulation disorders
Both obese and very lean women were excluded from the study.

Statistical Analysis

Data was expressed as mean and percentage. Patient characteristics were compared using chi-square analysis and

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student t- test. Two sided p<0.005 was defined for significance. Software used was SPSS 16.0 and MS Excel.

RESULTS

1. Mean duration to induce pneumoperitoneum:

Table 1

Direct trocar group	3.8± 0.5 min.
Verees needle group	6.2± 1.0 min.

p<0.001(Sig)

The time required for creation of pneumoperitoneum was significantly less in direct trocar technique group (3.8±0.5 min.) than veress needle group (6.2± 1.0 min.).

2. Distribution of complications among studied subjects:

Table 2

			TYPE		Total
			DT	VN	
Complications	Conversion to open	Count	0	1	1
		% within TYPE	0.0%	1.0%	0.5%
	Port site bleeding	Count	1	2	3
		% within TYPE	1.0%	2.0%	1.5%
	Preperitoneal emphysema	Count	1	4	5
		% within TYPE	1.0%	4.0%	2.5%
	Subcutaneous emphysema	Count	3	2	5
		% within TYPE	3.0%	2.0%	2.5%
	Omental bleeding	Count	0	2	2
		% within TYPE	0.0%	2.0%	1.0%
	Wound infection	Count	1	1	2
		% within TYPE	1.0%	1.0%	1.0%
	Port site hernia	Count	1	2	3
		% within TYPE	1.0%	.0%	1.5%
	Port site endometriosis	Count	1	2	3
		% within TYPE	1.0%	2.0%	1.5%
Total		Count	100	100	200
		% within TYPE	100.0 %	100.0%	100.0%

P value > 0.005(NS)

The complications like conversion to open surgery, port site bleeding, preperitoneal emphysema, omental bleeding, port site hernia and port site endometriosis were more common in veress needle group as compared to direct trocar group, however the difference was statistically insignificant.

DISCUSSION

Direct trocar insertion technique is more commonly used by gynecologists for creation of pneumoperitoneum and primary port placement during laparoscopic surgeries, however the technique requires good abdominal relaxation and proper incision for safe abdominal access. Other techniques used for creation of pneumoperitoneum during surgery are veress needle, optical trocar and open laparoscopy technique. Present study was conducted to compare safety profile of direct trocar insertion technique and veress needle technique. Mean duration to achieve pneumoperitoneum in our study was significanty less in direct trocar group (3.8± 0.5 min.) as compared to veress needle group (6.2± 1.0 min). Similar results were obtained in studies by A khan sangrasi et el 2011[7], K theodoropoulou MD *et al* 2008. [8]

Our study has shown that the complication rate was higher with veress needle technique (out of hundred cases done one was converted to open, four had preperitoneal emphysema, two omental bleeding has occurred) than with direct trocar technique (out of hundred cases, no patient was converted to open, no omental or vascular injury has occurred however in three patients subcutaneous emphysema occurred), but the difference was statistically insignificant. This is in line with the known low level of complications as reported in other studies. Mary *et al* in 2002 retrospectively studied 1223 patients who underwent operative laparoscopy by direct trocar technique and no trocar related injury was reported.[9] Mahmoud S Zakherah in 2010 compared 500 patients who have undergone diagnostic laparoscopy by direct trocar technique with 500 patients in whom veress needle technique was used for pneumoperitoneum creation and observed higher minor complication rate with veress needle than direct trocar technique.[10] Nezhat *et al* in 1991 did randomized prospective study and observed minor complication rate of 22% after veress needle and 6% after direct trocar insertion.[11] Therefore direct trocar technique for creation of pneumoperitoneum is safer alternative to veress needle technique with further advantages of rapid creation of pneumoperitoneum, avoids multiple attempts at abdominal entry and less gas usage.

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