

# A Comparative Interventional Study Using Single Port and Double Port Methods in Diagnostic Laparoscopy for Evaluation of Cases of Infertility

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## ABSTRACT

**Introduction:** Overall incidence of infertility is 10-15%. Of all the couples attempting to conceive, 16% are unsuccessful after one year, this reduce to 8% after 2 years and 7% after 3 years. The aim of this study to compare single puncture with double puncture diagnostic laparoscopic technique and to evaluate benefits and side effects of a second puncture in infertile women.

**Material and Methods:** This study is a hospital based comparative type of interventional study to be conducted in the Mahatma Gandhi Hospital, Bhilwara, Rajasthan. 100 patients divided in two group, Group A (50 Infertile women viewed by single port method) and Group B (50 Infertile women viewed by double port method). Panoramic view of following organs-uterus, both ovaries, both tubes, anterior pouch and pouch of Douglas, adhesions, other pathologies (eg Endometriosis, PCOS, TB) and spill of dye to make a diagnosis.

**Results:** Our study showed that the mean age of patients was (26.18±4.46) in single port and 24.74±3.652 in double port, but was not statistically significant (P=0.078) (table 1).

In this study the type of infertility was insignificant in single port and double port methods. Visualization of Doglus pouch mostly in double port as compared to single port, which was statistically significant (P<0.0001) (table 2,3,4). The common finding was tubal blockage in 7 (21.9%) and 6 (33.3%) cases of primary and secondary infertility respectively (table 5,6).

**Conclusion:** The results of this study reveal that Hysterosalpingography is of limited diagnostic value in tubal factor infertility and of low diagnostic value for pelvic adhesions. Therefore, we believe that laparoscopy should be performed in cases of abnormal hysterosalpingograms and even in cases of normal hysterosalpingograms in the context of unexplained infertility.

**Keywords:** Hysterosalpingography, Double port, Single port, Infertility, Laparoscopy

## INTRODUCTION

Infertility is defined as the incapability of a couple to achieve conception after a year of unprotected intercourse.”Overall incidence of infertility is 10-15%.Of all the couples attempting to conceive, 16% are unsuccessful after one year, this reduce to 8% after 2 years and 7% after 3 years.

Diagnostic laparoscopy is a gold standard technique for evaluating these cases.The view obtained at laparoscopy is better than at the time of laparotomy. This is called “Panoramic view”. The idea is to visualize the Uterus, both tubes and ovaries, Pouch of Douglas or any other pathology if present and also do achromo perturbation test for

evaluating patency of the fallopian tubes. Introducing only one port for entry of camera *vis a vis* one extra ancillary port for diagnostic purpose for manipulating abdomino-pelvic structures has been recommended by several authors but authentic studies are lacking.<sup>1</sup> The aim of this study to compare single puncture with double puncture diagnostic laparoscopic technique and to evaluate benefits and side effects of a second puncture in infertile women.

## MATERIAL AND METHODS

This study is a hospital based comparative type of interventional study to be conducted in the Mahatma Gandhi Hospital, Bhilwara, Rajasthan.

### Inclusion criteria

All infertile women between 20 to 40 years posted for diagnostic laparoscopy and chromoperturbation test and consenting for the study.

### Exclusion criteria

- Age < 20 years and > 40 years
- Patients during their menstruation period
- Cardio-respiratory diseases.
- Contraindication for laparoscopy.
- Contraindications of GA.

Selection of infertile women between 20-40 years (n=100) were done after detailed history, thorough clinical examination and all routine investigations and ultrasonography. Informed written consent was taken. 100 patients divided in two group, Group A (50 Infertile women viewed by single port method) and Group B (50 Infertile women viewed by double port method). Panoramic view of following organs-uterus, both ovaries, both tubes, anterior pouch and pouch of Douglas, adhesions, other pathologies (eg Endometriosis, PCOS, TB) and spill of dye to make a diagnosis.

## RESULTS

Our study showed that the mean age of patients was (26.18±4.46) in single port and 24.74±3.652 in double port, but was not statistically significant (P=0.078) (table 1).

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Group	N	Mean	Std. Deviation
Single port	50	26.18	4.402
Double port	50	24.74	3.652

t = 1.780 with 98 degrees of freedom; P = 0.078 (NS)

**Table-1:** Comparison of Mean age (years) of Study groups

Infertility	Single port		Double port		Total
	N	%	N	%	
Primary	23	46	27	54	50
Secondary	27	54	23	46	50
Total	50	100	50	100	100

Chi-square = 0.360 with 1 degree of freedom; P = 0.549 (NS)

**Table-2:** Distribution of Study subjects according to type of infertility

Dye in Pouch of Doglus	Single port		Double port		Total
	N	%	N	%	
Seen	17	34	17	34	34
Not seen	33	66	33	66	66
Total	50	100	50	100	100

Chi-square = 0.045 with 1 degree of freedom; P = 0.833 (NS)

**Table-3:** Visualization of Dye in Pouch of Doglus in both groups

Group	N	Mean	Std. Deviation
Single port	50	15.59	0.937
Double port	50	15.26	1.509

t = 1.314 with 98 degrees of freedom; P = 0.192 (NS)

**Table-4:** Comparison of Mean Operating time (min) among Study groups

Likert Score	Single port		Double port		Total
	N	%	N	%	
3	14	28	17	34	31
4	18	36	15	30	33
5	18	36	18	36	36
Total	50	100	50	100	100

Chi-square = 0.563 with 2 degrees of freedom; P = 0.755 (NS)

**Table-5:** Comparison of Groups based on Ease for Surgeon

In this study the type of infertility was insignificant in single port and double port methods. Visualization of Doglus pouch mostly in double port as compared to single port, which was statistically significant ( $P < 0.0001$ ) (table 2,3,4). The common finding was tubal blockage in 7 (21.9%) and 6 (33.3%) cases of primary and secondary infertility respectively (table 5,6).

## DISCUSSION

Our study showed that the mean age of patients was (26.18±4.46) in single port and 24.74±3.652 in double port, but was not statistically significant ( $P = 0.078$ ). Jean Dupont Kemfang Ngowa et al (2015)<sup>2</sup> showed mean age of the patients was 31.4± 6.4years (range from 19 to 44years). Age is a major factors and fertility rates have been shown to decline with age of the according to Krishna Menon, the

Diagnosis	Primary infertility		Secondary infertility	
	N	%	N	%
Normal	24	48	21	42
Uterine abnormality	3	6	4	8
Fibroid	2	4	3	6
Bicornuate	1	2	1	2
Ovarian pathology	6	12	4	8
Simple cyst	2	4	2	4
PCO	4	8	2	4
Blocked tube	12	24	16	32
Bilateral	10	20	14	28
Unilateral	2	4	2	4
Dilated tortuous tube	3	6	6	12
PID	8	16	12	24
Adhesion	5	10	7	14
Adenexal mass	3	6	5	10
Endometriosis	4	8	2	4

**Table-6:** Final diagnosis on Laproscopy

cumulative female fertility decreases after 30 years of age. Collins J.A. considers the age of the female partner as a prognostic factor in prolonged unexplained infertility.<sup>3</sup> In addition to the inherent efforts of age on the reproductive organs, advancing age increases the interval of time available for exposure to diseases with potentially damaging effects on fertility, including endometriosis, STDs and PID.<sup>4</sup> Hence there is decline of fertility with advantage age.

In this study the type of infertility was insignificant in single port and double port methods. Visualization of Doglus pouch mostly in double port as compared to single port, which was statistically significant ( $P < 0.0001$ ). Technically, the major advantages of laparoscopic surgery is that it provides adequate visualization of the entire abdominal cavity and localization of pathology more precise irrigation of peritoneal cavity under pressure.

In laparoscopic procedure the right and left fallopian tube and ovary completely seen in double port as compared to majority of patients was seen only one third part in single port method, which was statistically significant ( $P < 0.0001$ \*\*\* and  $P < 0.0001$ \*\*\* respectively). Exploration of the female genital tract is one of the essential elements of infertility assessment. Laparoscopy provides both a panoramic view of the pelvic reproductive anatomy and a magnified view of pelvic organs and peritoneal surfaces. It is generally accepted that, diagnostic laparoscopy is the gold standard in diagnosing tubal pathology and other intra-abdominal causes of infertility.<sup>5-8</sup>

The presence of adhesions, structural abnormalities of the uterus, endometriosis and fallopian tube patency were sought for. In our study spill of dye was insignificant ( $P = 0.833$ ) and 66% patients have not shown the dye in doglus pouch in both approach in laparotomy.

The false positive results may be explained by the fact that in the presence of peritubal adhesions, even though the tubes may be patent, focal contrast deposits can lead to the misinterpretation as distal occlusions.<sup>8</sup> Another explanation should be the faulty technique occurring while performing

HSG. Insufficient pressure during uterine injection of contrast material due to vaginal reflux or the absence of the late radiographs for detection of pelvic diffusion of contrast material can lead to misdiagnosing as distal occlusion.

Single port is of limited diagnostic value in tubal factor infertility and of low diagnostic value for pelvic adhesions. Therefore, double port methods should be performed in cases of abnormal single port and even in cases of normal hysterosalpingograms in the context of unexplained infertility.

Our study consisted with Aziz N (2010)<sup>9</sup> the common finding was tubal blockage in 7 (21.9%) and 6 (33.3%) cases of primary and secondary infertility respectively. Five (15.6%) cases of primary infertility were detected as polycystic ovaries (PCO) which was not found in cases of secondary infertility. Endometriosis was found in 4 (12.5%) cases with primary infertility and 2 (11.1%) cases with secondary infertility. Pelvic inflammatory disease (PID) was found in 1 (3.1%) and 2 (16.7%) cases of primary and secondary infertility respectively. Peritubal and periovarian adhesions were detected in 2 (6.3%) cases with primary infertility and 4 (22.2%) cases with secondary infertility. Fibriod was found in 2 (6.3%) and 1 (5.6%) cases of primary and secondary infertility respectively. Ovarian cyst detected in 2 (6.3%) cases with primary infertility while none was found in cases of secondary infertility.

## CONCLUSION

The results of this study reveal that Hysterosalpingography is of limited diagnostic value in tubal factor infertility and of low diagnostic value for pelvic adhesions. Therefore, we believe that laparoscopy should be performed in cases of abnormal hysterosalpingograms and even in cases of normal hysterosalpingograms in the context of unexplained infertility.

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