



## Laparoscopic Evaluation of Tubal Factor in Infertility

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### Abstract

**Background:** Tubal factor infertility accounts for approximately 25-35% of cases of female infertility. The evaluation of the fallopian tube is necessary to determine the management plan for infertility. Tubal patency can be diagnosed by hysterosalpingography (HSG) or laparoscopy with chromopertubation. The aim of this study was to determine the role of laparoscopy in the evaluation of tubal factor in infertile women.

**Methods:** A prospective study was performed on 158 consecutive patients who underwent laparoscopy as part of infertility evaluation. The laparoscopic findings were documented.

**Results:** Of the 158 patients who underwent laparoscopy, 95 (60.1 %) patients had evidence of tubal disease as evidenced by unilateral or bilateral tubal block, peritubal adhesions, hydrosalpinx, beading of the tube and unhealthy shaggy appearance. Of the patients with tubal disease in our study, 64% had block in one or both tubes, 70% had peritubal adhesions, 13.7% had hydrosalpinx and 62.1% had unhealthy looking tubes. Of the 95 patients with tubal disease 48.4% (n=46) had evidence of endometriosis. Tubal disease was predominant in the age group 26 - 35 years, almost 75 %. Of the 95 patients with tubal disease, 61 patients (64%) had primary infertility. 77% of the patients with tubal disease were married for a period of less than 10 years.

**Conclusion:** Laparoscopy is an effective diagnostic tool for evaluation of tubal pathology. Laparoscopy and chromopertubation test should be recommended for all infertile patients with tubal factor. Further it enables correction, in possible cases.

**Keywords:** Chromopertubation, Infertility, Laparoscopy, Tubal factor.

### Introduction

Tubal factor infertility accounts for about 25 – 35 % of female factor infertility. The most prevalent cause of tubal factor infertility is pelvic inflammatory disease and acute salpingitis. The incidence of tubal damage after one episode of pelvic infection is approximately 12%, 23% after two episodes and 54% after three episodes.<sup>1,2</sup>

Proximal, distal, and peritubal damage can be caused by a number of pathologic processes such as inflammation, endometriosis, and surgical trauma.<sup>3</sup>

A tubal blockage located close to the uterus is called a “proximal” tubal blockage. According to ASRM, proximal tubal blockage accounts for 10 to 25 percent of tubal disease.

Genital tuberculosis is an important cause of female infertility in developing countries. It causes severe damage and unlike pulmonary tuberculosis, is often asymptomatic or with varied presentation and difficult to diagnose<sup>4</sup>. A combination of clinical tests and laparoscopic method may often help in diagnosis.

Tubal pathology impairs functions of the fallopian tube and reduces fertility. The degree of tubal pathology determines the possibility for fertility. Evaluation of fallopian tube is necessary to determine the management plan in infertility.

Hysterosalpingography (HSG) is often performed as a first line approach to assess tubal patency and the presence of adhesions; however, HSG has limitations in detecting tubal pathology.<sup>5</sup> It may not help in diagnosis of peritubal adhesions and tubo ovarian mal alignment.

Laparoscopy and chromopertubation is widely considered the gold standard test for investigating tubal patency. Additionally, it allows assessment for peritubal disease, adhesions and endometriosis. This has led to a recommendation by the NICE (UK) that women suspected of having comorbidities such as endometriosis and pelvic inflammatory disease should undergo laparoscopy so that pelvic and tubal pathology can both be assessed.<sup>6</sup> It also offers the advantage of corrective steps at the same sitting.

The aim of the study was to evaluate the role of laparoscopy in diagnosis of tubal factors in infertile women.

### Materials and Methods

A prospective study was done in women undergoing laparoscopy at the Reproductive Medicine unit in SAT Hospital, Government Medical College Trivandrum for 1 year in 2015. 158 consecutive women who underwent laparoscopy were included in the study. Women with obvious evidence of endometriosis on ultrasound were excluded from the study.

Clearance was obtained from the Institutional Review Board and Ethics Committee. Written informed consent was obtained from all the subjects.

A detailed history was taken from all the subjects and demographic details, type and duration of infertility and previous pregnancy loss recorded. The symptomatology was also noted. Infertility was defined as failure to conceive after one year of unprotected intercourse. Laparoscopy was performed for all patients with suspicion of tubal infertility like abnormal findings on hysterosalpingogram or ultrasound. Other indications were suspected endometriosis, myomectomy, laparoscopic ovarian drilling and unexplained infertility. Laparoscopy was performed in the proliferative phase by two surgeons and the pelvis was examined in detail with special reference to the appearance of the tubes. Chromotubation was also done. Meticulous documentation of the laparoscopic findings was done.

Data was expressed in frequency distribution and data analysis was performed using SPSS Version 22.0. Between group comparisons of qualitative variables were analysed by Chi Square Test. A p value of 0.005 was taken as the level of significance.

### Results

Of the 158 patients who underwent laparoscopy, 95 patients had evidence of tubal disease, as evidenced by unilateral or bilateral tubal block, peritubal adhesions, hydrosalpinx, beading of the tube and unhealthy shaggy appearance.

**Table 1:** Age distribution of infertility cases.

Age	TUBAL DISEASE				Total		$\chi^2$	df	P
	Present		Absent		N	%			
	N	%	N	%					
20-25	7	7.4	3	4.8	10	6.3	1.334	3	0.721
26-30	42	44.2	24	38.1	66	41.8			
31-35	29	30.5	22	34.9	51	32.3			
36-40	17	17.9	14	22.2	31	19.6			
Total	95	100	63	100	158	100			

Tubal disease was predominant in the age group 26-35 yrs (almost 75%).

**Table II :** Socioeconomic class and tubal disease

Socioeconomic class	TUBAL DISEASE				Total		$\chi^2$	df	P
	Present		Absent		N	%			
	N	%	N	%					
APL	52	54.7	32	50.8	84	53.2	0.237	1	0.627
BPL	43	45.3	31	49.2	74	46.8			
Total	95	100	63	100	158	100			

There was no significant difference between the socioeconomic status of patients with and without tubal disease.

**Table III:** Tubal disease in primary and secondary infertility

INFERTILITY TYPE	TUBAL DISEASE				Total		$\chi^2$	df	P
	Present		Absent		N	%			
	N	%	N	%					
Primary	61	64.2	47	74.6	108	68.4	1.891	1	0.169
Secondary	34	35.8	16	25.4	50	31.6			
Total	95	100	63	100	158	100			

Of the 95 patients with tubal disease, 61 patients (64%) had primary infertility. 77% of the patients were married for a period of less than 10 years. Ectopic pregnancy occurred in only 16.8 % of patients with tubal disease.

In patients with tubal disease the significant signs and symptoms were chronic pelvic pain (p=0.018), tenderness in fornices during pelvic

examination (p=0.009), presence of adnexal mass (p=0.027) and restricted mobility of the uterus (p<0.001).

Of the patients with tubal disease 64% had block in one or both tubes, 70% had peritubal adhesions, 13.7% had hydrosalpinx and 62.1% had unhealthy looking tubes.

**Table IV:** Tubal block

LAP- TUBES	TUBAL DISEASE				Total	
	Present		Absent		N	%
	N	%	N	%		
B/I free spill	34	35.8	63	100	97	61.4
Only R tube	21	22.1	0	0	21	13.3
Only Left tube	20	21.1	0	0	20	12.7
B/L no spill	20	21.1	0	0	20	12.7
Total	95	100	63	100	158	100

**Table V :** Peritubal adhesions

LAP-PERITUBAL ADHESION	TUBAL DISEASE				Total		$\chi^2$	df	P
	Present		Absent		N	%			
	N	%	N	%					
Present	70	73.7	0	0	70	44.3	83.347	1	<0.001
Absent	25	26.3	63	100	88	55.7			
Total	95	100	63	100	158	100			

**Table VI :** Hydrosalpinx

LAP-HYDRO SALPINX	TUBAL DISEASE				Total		$\chi^2$	df	P
	Present		Absent		N	%			
	N	%	N	%					
Present	13	13.7	0	0	13	8.2	9.394	1	0.002
Absent	82	86.3	63	100	145	91.8			
Total	95	100	63	100	158	100			

**Table VII : Unhealthy appearance of tubes**

LAP-healthy appearance	Un	TUBAL DISEASE				Total		$\chi^2$	df	P
		Present		Absent		N	%			
		N	%	N	%					
Present		59	62.1	0	0	59	37.3	62.444	1	<0.001
Absent		36	37.9	63	100	99	62.7			
Total		95	100	63	100	158	100			

**Table VIII : Evidence of endometriosis**

E/O Endometriosis	TUBAL DISEASE				Total		$\chi^2$	df	P
	Present		Absent		N	%			
	N	%	N	%					
Present	46	48.4	7	11.1	53	33.5	23.654	1	<0.001
Absent	49	51.6	56	88.9	105	66.5			
Total	95	100	63	100	158	100			

Of the 95 patients with tubal disease 48.4% (n=46) had evidence of endometriosis in laparoscopy like endometriotic deposits, adhesions and partial or complete obliteration of the pouch of Douglas.

**Discussion**

In our study of the 158 patients who underwent laparoscopy, 60 (n=95) patients with infertility had tubal disease. 95 patients had evidence of tubal disease as evidenced by unilateral or bilateral tubal block, peritubal adhesions, hydrosalpinx, beading of the tube and unhealthy shaggy appearance. 64% had block in one or both tubes, 70% had peritubal adhesions, 13.7% had hydrosalpinx and 62.1% had unhealthy looking tubes. The incidence is similar to other studies by Shetty et al;<sup>7</sup> Chaudhari et al.<sup>8</sup>

There were no cases with suggestive findings of genital tuberculosis.

61 % of cases had tubal block in one or both tubes in our study, while Kanal P and Sharma S in their study, reported tubal blockage in 42.5% of primary infertility.<sup>9</sup> In Aziz study , the incidence of tubal block was around 55 %.<sup>10</sup>

In our study,of the 95 patients with tubal disease 48.4% (n=46) had evidence of endometriosis in laparoscopy like endometriotic deposits, adhesions and partial or complete obliteration of the pouch of Douglas.

Of the 95 patients with tubal disease 61 patients (64%) had primary infertility. Tubal disease was predominant in the age group 26-35 yrs (almost 75%). There was no significant difference between the socioeconomic status of the patients with and without tubal disease. 77 % of the patients with tubal disease were married for a period of less than 10 years. Ectopic pregnancy had occurred in only16.8% of the patients with tubal disease. 80% of patients with tubal disease had regular cycles.

In patients with tubal disease the significant signs and symptoms were chronic pelvic pain (p=0.018), tenderness in fornices during pelvic examination (p=0.009), presence of adnexal mass (p=0.027) and restricted mobility of the uterus (p<0.001). Of the patients with tubal disease 46.3% had adnexal mass in ultrasonogram.

Laparoscopy remains the gold standard for the evaluation of tubal factor in infertility. It offers the advantage of immediate treatment / correction of the pathology in possible cases. Removal of hydrosalpinx if detected, is indicated especially if the patient plans invitro fertilization. Cauterisation or removal of endometriotic deposits is another benefit.

Tubal occlusion and peritubal or periovarian adhesions are factors responsible for inhibition of ovum pickup and transport. Laparoscopy is thus a definitive way to diagnose them. Additional pelvic

pathology like fibroids, uterine anomalies are often picked up during laparoscopy.

However, the procedure of laparoscopy being surgical, is invasive and carries operative and anaesthetic risks. Hence needs to be restricted to selected cases where a strong suspicion of a tubal pathology exists. HSG should be considered an alternative tool, when a tubal pathology is not strongly suspected and a simple evaluation of patency is all that is needed.

### Conclusion

The incidence of tubal disease in our study was 60%. Laparoscopy with chromopertubation and evaluation of associated pelvic pathology remains the gold standard for detection and management of tubal disease.

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**Conflict of interest:** None declared

**Ethical approval:** The study was approved by the Institutional Ethics Committee

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