

THE ROLE OF SALPINGOSCOPY IN TUBAL FACTOR OF INFERTILITY

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ABSTRACT

Objective : To evaluate the role of the salpingoscope in the prediction of reproductive outcome in cases of female infertility and to correlate these findings with salpingographic and laparoscopic findings.

Design: Prospective study.

Setting : Tanta University Hospitals and El-Mataria Teaching Hospital.

Patients : The study was carried out on 30 women during the reproductive age; 17 were primary infertile and 13 were secondary infertile.

Intervention: All the patients were subjected to history taking, physical examination, HSG, laparoscopy and salpingoscopy under general anesthesia.

Outcome measures: Pregnancy occurred in 56.7% of cases reported as salpingoscopically normal and in 33.3% of cases found to be abnormal salpingoscopically and treated.

Results: There was a discrepancy between findings detected by HSG and those found by laparoscopy. Laparoscopy examination revealed that pelvic and peritubal abnormalities were also found in 13.56% of cases diagnosed normal by HSG. We also found a discrepancy between salpingoscopic and salpingographic findings. Fifty five Fallopian tubes were considered normal by HSG; 11 of these tubes (18.6%) were proved by salpingoscopy to have intratubal pathology. This study demonstrated that there is also discrepancy between findings at laparoscopy and those of salpingoscopy when both were done at the same setting as 71.2% of the studied tubes were considered laparoscopically free of tubal pathology, 20% of them were proved salpingoscopically to have intratubal pathology.

Conclusion: Both laparoscopy and salpingoscopy are complementary procedures and their combination should be a standard part of the investigations.

Key words: Salpingoscopy, tubal infertility, laparoscopy.

INTRODUCTION

Tubal factor in infertility accounts for approximately 30-50% of cases of female infertility⁽¹⁾. The commonest causes of tubal factors in infertility include infectious and non-infectious causes. The infectious causes may not be originated in the female reproductive system or originated in the female reproductive system (as obstetrical). The non infectious causes include endometriosis, myomatosis and agenesis⁽²⁾. There are 4 diagnostic techniques that are used to explore the tubal factor in the infertile patient. These techniques are: hysterosalpingography, sonohysterography, Laparoscopy and salpingoscopy⁽³⁾.

Intraluminal tubal endoscopy may be performed through the transvaginal route (fallopscopy) or by the transabdominal (salpingoscopy) approach^(4,5).

The aim of this work was to evaluate the role of the salpingoscope in the prediction of reproductive outcome in cases of female infertility and to correlate these findings with salpingographic and laparoscopic findings.

MATERIALS & METHODS

This study was conducted upon patients attending the outpatient clinics of the Obstetrics and Gynecology Department, Tanta University Hospital,

and El-Mataria Teaching Hospital complaining of infertility whether primary or secondary during the period from June 2002 until June 2005.

The study group consisted of 30 patients who were selected from 77 patients with history of primary infertility in 17 cases and secondary infertility in 13 cases. For each patient included in this study the following was carried out: history taking clinical examinations and routine blood examination. Investigations required for infertility work up, namely: semen analysis, pelvic U/S and HSG, and hormonal profile were done when required.

Patients with bilateral hysterosalpingographic abnormalities or abnormal semen analysis were excluded from this study.

All patients were subjected to laparoscopy and salpingoscopy under general anesthesia. Also, hysteroscopy was done in some patients when required.

All the procedures had been done during the proliferative phase of the menstrual cycle to exclude current pregnancy and to minimize bleeding at operative laparoscopy or salpingoscopy.

The observed salpingoscopic findings were tabulated according to Brosens classification of tubal mucosal lesions⁽⁶⁾.

RESULTS

The 30 patients in the study represent 59 Fallopian tubes for examination as one case had only one tube since the other one was removed after ectopic tubal pregnancy (tables I-V).

The age of the patients ranged from 20 and 38 years with a mean of 31.33 ± 4.96 years.

The mean duration of infertility was 4.83 ± 2.21 years with a range of 2-11 years.

Seventeen cases (56.6%) were primary infertile while 13 cases (43.3%) were secondary infertile.

All patients in the study were evaluated by HSG. Hysterosalpingographic evaluation of the Fallopian

tubes revealed that 56 tubes (94.92%) were patent.

DISCUSSION

The importance of tubal obstruction as a major cause of infertility was recognized by Burns⁽⁷⁾. Since that time a number of methods of demonstrating tubal patency have been described. These include transcervical insufflation with gas, injection of radio-opaque or echogenic contrast media and chromopertubation during laparoscopy. Patency may also be confirmed by cannulation which can be performed by tactile method or under hysteroscopic, ultrasonic or fluoroscopic guidance⁽⁸⁾.

There may be discrepancies between the findings at HSG, laparoscopy and intraluminal endoscopy in the presence of peritubal adhesions or endometriosis. It is well known that a HSG is not entirely reliable and has poor concordance with endoscopic findings⁽⁷⁾. Patency of the distal tube does not necessarily equate with normality of the mucosa and pathological lesions may be missed if more accurate methods of tubal assessment were not employed.

Until recently there was no endoscopic technique available for examining the tubal mucosa and it had to be assumed that normal findings at HSG and laparoscopy equated with a normal tubal patency and anatomy. Close examination of the fimbrial mucosa at the time of tubal microsurgery had been introduced already using micro biopsies, the operating microscope or an endoscope⁽⁹⁾.

Evaluation of the pelvis in infertile women was classically performed first by HSG, completed by diagnostic laparoscopy in cases of abnormal HSG findings or when unexplained infertility is suspected, before referring the patient to in vitro fertilization (IVF). However, if investigation is limited to HSG and laparoscopy alone, accurate assessment of the Fallopian tube can not be overstated⁽¹⁰⁾.

Since the first report on the value of salpingoscopy at the time of tubal microsurgery, there had been an increasing interest in the salpingoscopic technique to detect intraluminal lesions which may be

inversely correlated with pregnancy outcome⁽⁴⁾.

Salpingoscopy is the logical extension of laparoscopic surgery for the evaluation of the endosalpinx as it provides direct visualization of the internal tubal anatomy⁽⁶⁾.

The American Society of Reproductive Medicine recognized the importance of intraoperative salpingoscopy to visualize the entire length of the ampullary mucosa and proved that it has an important prognostic value⁽⁷⁾.

Table I: Laparoscopic findings.

Laparoscopy finding	No. of tubes	%
Peritubal adhesions	8	13.56
Pelvic endometriosis	6	10.18
* Delayed spill of dye	12	20.33
Others (PCO)	9	15.25
Normal tubes	24	40.68

* N.B. Delayed spill of the dye means positive methylene blue test with patent tube but the spill of the dye was delayed. So, these tubes are considered normal as regards statistical analysis however, this laparoscopic finding could not be by - passed as it pertains good relation to fertility outcome.

Table II: Salpingoscopic findings.

Laparoscopy finding	No. of tubes	%
Adhesions between major folds (Grade III lesion)	6	10.2
Flattening and separation of folds (Grade II lesion)	2	3.3
(Grade II and III lesions)	3	5.1
Grades IV and V lesions	00	00
Normal tube	48	81.3

Table III: Comparison between Hysterosalpingography and salpingoscopy.

Normal tube by HSG		Normal tube by salpingoscopy	
No.	%	No.	%
59	100%	48	81.3%

Table IV: Comparison between laparoscopic and salpingoscopy findings.

Tubal abnormalities detected by laparoscopy (n = 30)			Salpingoscopic evaluation (n=30)
No	%	Laparoscopic findings	
4	13.3	Pelvic adhesions	All tubal mucosa were free by salpingoscopy.
6	20	Delayed spill of dye	Filmy adhesions or ↑↑ mucous in the lumen.
3	10	Pelvic endometriosis	all tubal mucosa were free by salpingoscopy.

From table (IV) it is evident that while laparoscopy was superior in detecting both pelvic and peritubal abnormalities, salpingoscopy was superior in detecting endotubal abnormalities.

Table V: Shows operative findings & management of all patients in the study.

Pt.	Laparoscopic findings	Salpingoscopic findings	Management	Outcome
1	Bilateral delayed spill of the dye with PCO	Grade III bilateral lesion (Thin adhesions between major folds)	Intraluminal adhesiolysis by the leading edge of the salpingoscope	Delivery of full term living ♂
4	Minimal pelvic adhesions	NAD	Adhesiolysis	Unknown
6	Pelvic adhesion (Perforated appendix)	NAD	Adhesiolysis with Rt. fimbriostomy	Delivery of full term living ♂
8	Endometriosis (stage II)	NAD	Adhesiolysis	Expectant follow up
9	Bilateral PCO	↑↑ viscid mucous	Adhesiolysis	Expectant follow up
10	Patent both tubes; delayed spill from fimbriae	↑↑ viscid mucous secretion (inspissated)	Hysteroscopic wash of the mucous	Delivery of full term living ♂
11	Bilateral PCO + Normal tubes	NAD	Nothing	Expectant follow up
12	NAD	Grade III (Agglutination + adhesion bet. Rt. folds)	Rt. tubal cannulation & selective chromotubation	Delivery of full term living ♀
13	Rt. peritubal adhesion (previous appendectomy)	NAD	Adhesiolysis	Unknown
15	NAD	↑↑ inspissated mucous inside both tubes	Hysteroscopic wash of the mucous	Delivery of full term living ♀
16	Bilateral PCO + Normal tubes	NAD	Nothing	Unknown
17	Bilateral peritubal adhesion. (previous appendectomy)	NAD	Adhesiolysis	Pregnancy ended by abortion at 18 weeks
18	Endometriosis (stage III)	NAD	Adhesiolysis	Unknown
19	Delayed spill of Rt. tube (Lt. tube absent after ectopic tubal pregnancy)	Grade II & III lesions (adhesions on major folds of Rt. tube)	Intraluminal adhesiolysis by the leading edge of the salpingoscope	Pregnancy ended by abortion at 12 weeks
20	Delayed spill of dye from both fimbriae	Grade III (Bilateral fine filmy focal adhesions)	Fine dissection of intraluminal adhesions	Delivery of full term living ♀
21	NAD	Grade II & III lesions + thin adhesion (Bilateral)	Fine dissection of intraluminal adhesions	Delivery of full term living ♂
22	Endometriosis (stage II)	NAD	Cauterization of the endometriotic spots	Delivery of full term living ♀
24	Bilateral PCO Normal tubes	NAD	Nothing	Delivery of full term living ♀
26	Delayed spill of dye from both tubal fimbriae	↑↑ viscid mucous (inspissated)	Dilatation of both tubal fimbriae	Expectant follow up
27	No Abnormal Data (NAD)	Bilateral Grade II (flattening & separation of folds)	Dilatation of the tubal fimbriae	Delivery of full term living ♂
30	Delayed spil of dye from the tubes	↑↑ mucous & debris inside the Lt. tube	Lavage of the intraluminal mucous	Delivery of full term living ♂

Cases No.2,3,5,7,14,23,26,28 and 29 had normal both laparoscopic and salpingoscopic findings. Among them 4 cases got pregnant one of them ended by abortion at 14 weeks and the other 3 ended by vaginal delivery of full term living babies. No complications were recorded whether intra or post operatively in all cases. NAD = No Abnormalities Detected.

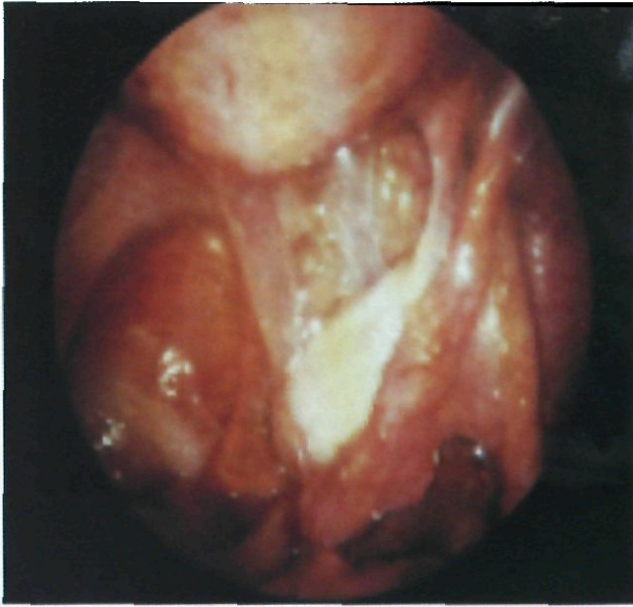


Fig. 1. Perovarian & tubal adhesions



Fig. 2. Grade II Focal adhesions

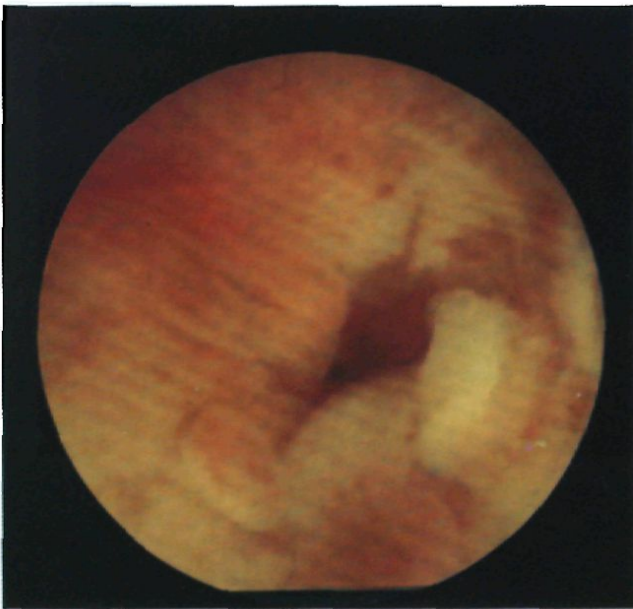


Fig. 3. Grade III Lesions with extensive adhesions

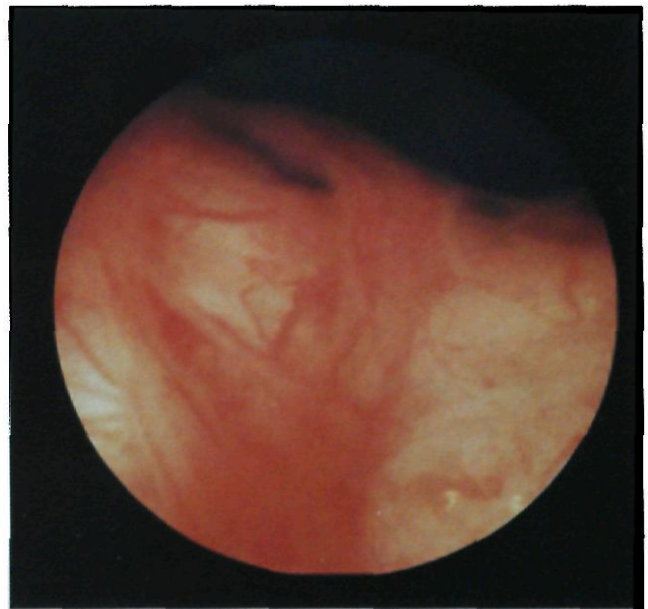


Fig. 4. Grade III Lesions with focal agglutination of mucosal folds



Fig. 5. Tubal ampulla

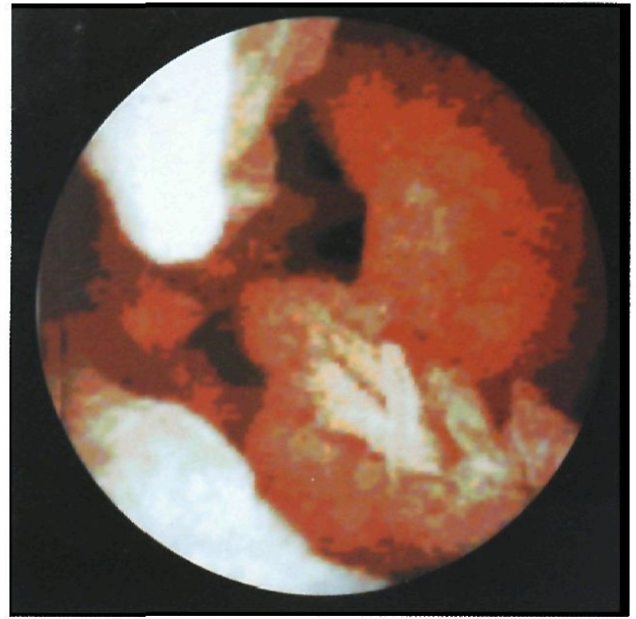


Fig. 6. Isthmico-ampullary junction

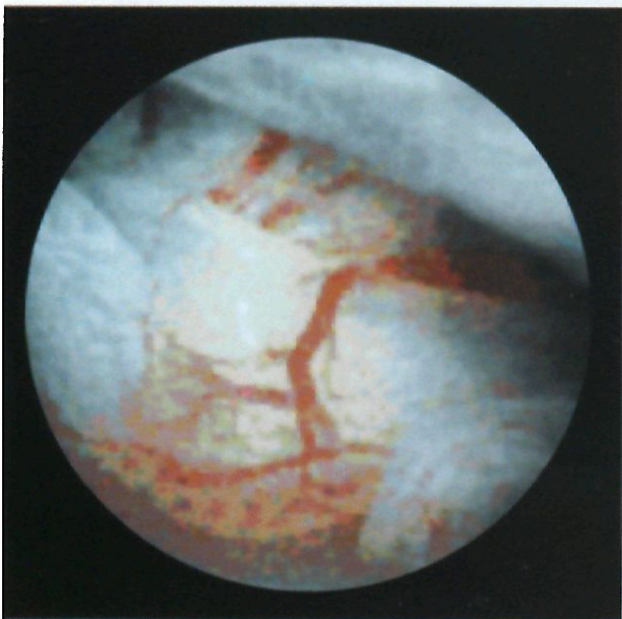


Fig. 7. Vascular pattern of major fold

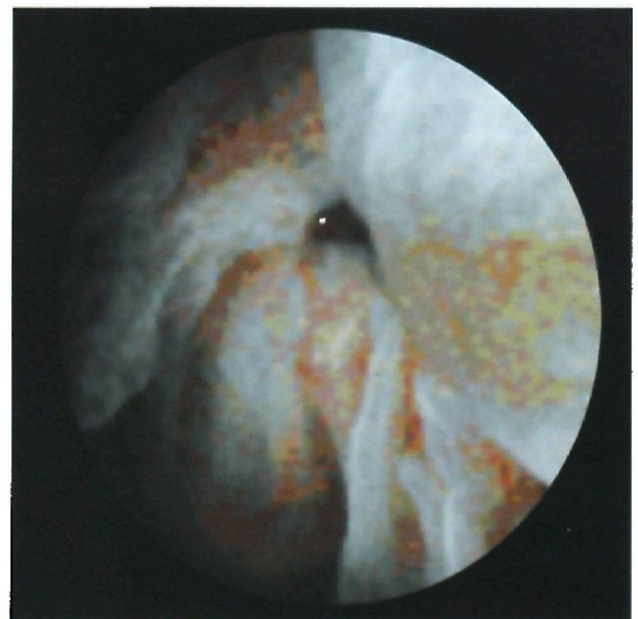


Fig. 8. Normal tubal mucosa

Detailed examination of the mucosa of the distal segment of the fallopian tube has an important role in the investigation of infertility work up. The intact *fold structure of the mucosa with its secretory and ciliated cells* is essential for normal gamete-transport and fertilization⁽⁶⁾.

With salpingoscopy, using a simple classification system, a trained endoscopist can evaluate the sequelae of tubal inflammatory disease and their impact on fertility outcome nearly as efficiently as with mucosal microbiopsies and they can direct their patients accordingly either towards reconstructive (micro) surgery or towards medically assisted reproduction, one of the most difficult decisions in reproductive surgery today⁽¹¹⁾.

The present study showed that there is discrepancy between findings detected by HSG and those found by laparoscopy. Laparoscopy examination revealed that pelvic and peritubal abnormalities were also found in 13.56% of cases diagnosed normal by HSG. These findings are similar to those previously reported by many authors (13,9 and 14). These studies reported that HSG is not a very accurate method to investigate tubal disease compared with the results obtained by laparoscopy which revealed abnormalities not detected by HSG as regards patency, peritubal and pelvic adhesions.

The present study showed that there is also discrepancy between salpingoscopic and salpingographic findings. Fifty five Fallopian tubes were considered to be normal by HSG; 11 of these tubes (18.6%) proved by salpingoscopy to have intratubal pathology.

These findings are in agreement with those reported by many other authors who reported the superiority of salpingoscopy over HSG in the assessment of tubal mucosa and stated that "HSG is not entirely reliable and has poor concordance with salpingoscopic findings since the latter is a direct visualization of the interior of the tube" (4,14,6,16 and 17).

The result of the current investigation demonstrated that there is also discrepancy between

findings at laparoscopy and those of salpingoscopy when both were done at the same setting. Tubal morphology at laparoscopy was defined as regular (normal morphology), convoluted (any kind of distortion or adhesions), or hydrosalpinx. Laparoscopic and salpingoscopic findings did not correlate. We found that 42 tubes (71.2%) were considered laparoscopically to be free of tubal pathology (methylene blue test positive on one or both sides). However, 6 of them (20 %) proved salpingoscopically to have intratubal pathology.

Our previous findings are similar to those previously reported by several authors who found marked mucosal damage at salpingoscopy in (18.7%), (21.2%) and (22%) of cases respectively which were considered laparoscopically to be free or had minimal pelvic adhesions (4,18 and 19).

On the contrary, Bowman and associates reported good correlation between intraluminal adhesions at salpingoscopy and pelvic adhesions found by laparoscopic examination in 66.6% of cases⁽²⁰⁾.

This discrepancy may be explained by the fact that most cases included in their studies had extensive pelvic adhesions which may be a result of severe pelvic inflammatory disease causing extensive peritubal and endotubal adhesions. This can be also explained by the modification of salpingoscopy (which had been done since 1989) from a flexible fiberscope (used in their study) which does not allow direct visualization of the endosalpinx to the rigid salpingoscope (used in the present study) that allows detailed visualization of the endosalpinx with the possibility of magnification up to 80 times. The use of the rigid salpingoscope required modification of the technique and yielded clear and specific view of the endotubal mucosa. Again, this discrepancy can be explained by the small number of patients included in the present study (30 cases) compared with (200 cases) included in their study.

Our present study depicted that when tubal pathology was suspected by laparoscopy (in 23.73%), salpingoscopic evaluation revealed that 5.1% of these

tubes were free of intratubal pathology. These findings agree with that reported by some authors (21,22,23 and 24).

The current investigation revealed that the number of pregnancies among cases reported salpingoscopically normal (as shown in table V) was 17 cases (56.7% and the number of pregnancies among cases found to be abnormal salpingoscopically and treated it was 10 (33.3%). These abnormalities had Grades II and III intraluminal adhesions. This pregnancy rate is considered within the average range reported in previous studies (19,25 and 26).

Last but not the least, we conclude that both laparoscopy and salpingoscopy are complementary procedures and their combination should be a standardized part of the work up of investigation of the infertile patients, especially in cases of unexplained infertility.

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