

## COMPARISONS OF HYSTEROSALPINGOGRAPHY AND LAPAROSCOPY RESULTS IN THE DIAGNOSIS OF TUBAL OCCLUSION

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### SUMMARY

**Objective:** The compliance rate between the hysterosalpingography (HSG) and laparoscopy (L/S) results in patients who diagnosed tubal occlusion on the HSG was investigated. Also, the incidence of endometriosis was evaluated in the study population.

**Material and methods:** Medical records of 139 women who were underwent L/S for the investigation of the tubal occlusion were reviewed retrospectively. The concordance rate between the HSG and L/S was investigated. The incidence of endometriosis in patients with no tubal pathology was compared with patients with unilaterally and bilaterally tubal occlusion.

**Results:** Mean age of the women was  $31.8 \pm 5.7$  years, mean BMI was measured as  $24.6 \pm 4.6$  kg/m<sup>2</sup>, and gravida 0 (0-5), mean infertility period was  $30.7 \pm 3.7$  months. Tubal occlusion was confirmed after the L/S in 38.8% of the patients (n=38) who has unilaterally tubal occlusion on the HSG. However, 58.8% (n=20) of the patients who were diagnosed as bilaterally tubal occlusion on the HSG was confirmed with the L/S. The misdiagnosis rate of the HSG was significantly high in women with unilaterally tubal occlusions compared with bilaterally tubal occlusions [(respectively, 61.2%, 51.2%) (p:0.001)]. Endometriosis was observed in 28.4% of the patients who had patent tubes and in 13.9% of the patients in the unilaterally tubal occlusion group and in 22.7% of the patients in the bilaterally tubal occlusion group. But the difference was not statistically significant when groups were compared according to the rate of endometriosis (p=0.24).

**Conclusion:** HSG is the first step diagnostic test for the assessment of the fallopian tubes. Although L/S is more invasive technique than HSG, L/S with chromopertubation is the gold standard test for identifying peritubal adhesive disease and endometriosis.

**Keywords:** endometriosis, hysterosalpingography, laparoscopy, tubal occlusion

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### ÖZET

#### TUBAL FAKTÖR TANISINDA HİSTEROSALPİNGOGRAFİ SONUÇLARININ LAPAROSKOPI SONUÇLARI İLE KARŞILAŞTIRILMASI

**Amaç:** Tubal faktör olgularında histerosalpingografi (HSG) ve laparoskopinin (L/S) uyumu ve infertilite etyolojisinde önemli yer tutan endometriozis hastalığının bulunma sıklığı araştırıldı.

**Gereç ve yöntemler:** İnfertilite kliniğinde 2006-2009 yılları arasında, HSG'de tubal faktör ön tanısı alan ve takiben L/S yapılan 139 hasta dahil edildi. HSG ve laparoskopi bulguları karşılaştırıldı. Ayrıca L/S'de endometriozis saptanan olguların tubal faktör varlığına göre dağılımı incelendi.

**Bulgular:** Olguların ortalama yaşı  $31.8 \pm 5.7$ , gravida 0 (0-5), infertilite süresi  $30.7 \pm 3.7$  ay, BMI  $24.6 \pm 4.6$  kg/m<sup>2</sup>

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olarak bulundu. HSG'de unilateral tubal oklüzyon saptanan olguların % 38.8'de (n=38), bilateral tubal faktör saptanan olguların % 58.8'da (n=20) L/S'de tubal oklüzyon saptandı. HSG'de unilateral tubal oklüzyon saptanan olgularda tubal faktör bulunmama oranı bilateral tubal oklüzyon saptanan olgulara kıyasla anlamlı olarak fazla bulundu [(sırasıyla, % 61.2, % 51.2) (p:0.001)]. L/S de tubal patoloji saptanmayan olgularda % 28.4 oranında endometriozis saptanırken, bu oran unilateral tubal faktör saptanan olgularda % 13.9, bilateral tubal faktör saptanan olgularda % 22.7 olarak bulundu. Gruplar arasında endometriozis insidansı bakımından fark bulunmadı (p=0.24). **Sonuç:** HSG infertil kadının değerlendirilmesinde ilk basamak tekniktir. Fakat, laparoskopi daha invaziv bir teknik olmasına rağmen, tubal tıkanıklıkları değerlendirmede gold standarttır.

**Anahtar kelimeler:** endometriozis, histerosalpingografi, laparoskopi, tubal faktör

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## INTRODUCTION

Hysterosalpingography (HSG) is a first line investigation of infertile women for the assessment of structure of tuba uterinas, their patency and uterine anomalies<sup>(1)</sup>. However, although a more invasive procedure, laparoscopy (L/S) is regarded as the most reliable method in detection of tubal pathologies in infertility<sup>(2)</sup>. Traditionally, L/S is the last diagnostic procedure during the infertility research; it has been included in the basic fertility studies by the American Fertility Society in 1992 and by the guideline of the World Health Organization<sup>(3-5)</sup>. Another advantage of L/S is the determination of other pelvic pathologies such as endometriosis and pelvic adhesions<sup>(6,7)</sup>. According to a study by Kalir et al. in the infertile women with no pathology diagnosed with HSG, the ratio of pathology detected by L/S was 21-68%<sup>(8)</sup>. In the present study the concordance between HSG and laparoscopy in patients with tubal factor and the frequency of endometriosis that has an important place in the etiology of infertility was investigated.

## MATERIALS AND METHODS

139 patients were included in the study that were admitted to the infertility clinic between 01.01.2006 and 01.12.2009 with identified unilateral and/or bilateral tubal factors according to the results of HSG and that were taken to L/S. All the patients' data were collected retrospectively from the file records.

HSG procedure was performed under local anesthesia using an oil-based radio opaque material (Lipiodol ultra-flu, 480 mg/10 ml, Guerbet). The control radiograph was taken 24 hours later. Laparoscopy was

planned for the patients who were pre-diagnosed with unilateral and/or bilateral tubal occlusion following HSG.

Laparoscopic surgery was performed during the follicular phase. During the laparoscopic observation after the assessment of bilateral ovaries, fallopian tube, uterus and other pelvic structures, tubal patency was evaluated by chromopertubation; pelvic adhesions, the existence of endometriosis and presence of other pathologies were specified.

For the statistical analysis SPSS package program for Windows was used (SPSS 10, Chicago, IL, USA). Chi-square test was used to analyze the data. P <0.05 was considered statistically significant.

## RESULTS

The mean age of the patients was 31.8 ± 5.7 years, gravida 0 (0-5), the duration of infertility was 30.7 ± 3.7 months, BMI was 24.6 ± 4.6. 64.7% of the cases were primary infertility, 35.3% of them were secondary infertility cases.

When the patients were assessed with L/S, 38.8% (n = 38) of the patients with unilateral tubal factor and 58.8% (n = 20) of patients with bilateral tubal factor that were detected with HSG, were found to have tubal occlusion. The rate of absence of tubal factor in cases that unilateral tubal occlusion was detected in HSG was significantly higher compared to patients diagnosed with bilateral tubal occlusion [(61.2%, 51.2%, respectively) (p = 0.001)]. The distribution of patients according to the results of laparoscopy in whom tubal factor was detected with HSG is shown in Table I.

With L/S endometriosis was seen in 28.4% of the patients with no reported tubal pathology, this ratio

was 13.9% for cases with unilateral tubal factor and 22.7% for cases with bilateral tubal factor. There was no difference between the groups in terms of the incidence of endometriosis ( $P = 0.24$ ). Incidence of endometriosis in patients with tubal factor is shown in Table II.

**Table I:** Distribution of cases according to laparoscopy results that have tubal factor in HSG.

	Laparoskopi (n,%)			
	Histerosalpingografi	Normal	Unilateral tubal patoloji	Bilateral tubal patoloji
Unilateral tubal oklüzyon (n=98)	60 (61.2)	34 (34.7)	4 (4.1)	
Bilateral tubal oklüzyon (n=41)	21 (51.2)	2 (4.9)	18 (43.9)	

$P=0.001$

**Table II:** The rate of endometriosis in the cases with tubal factor.

Laparoskopi	Endometriozis Evre			Toplam (n,%)
	Minimal (n=21)	Orta (n=10)	İleri (n=2)	
Tubal patoloji (n,%)				
Yok (n=81)	13 (16)	9 (11.1)	1 (1.2)	23 (28.4)
Unilateral (n=36)	5 (13.9)	0 (0)	0 (0)	5 (13.9)
Bilateral (n=22)	3 (13.6)	1 (4.5)	1 (4.5)	5 (22.7)

$P=0.24$

## DISCUSSION

HSG is the first line diagnostic method for the infertile patients. Patency of fallopian tube and uterine cavity are evaluated. However, evaluation with the opaque substance passing through the tubal lumen prevents the evaluation of tubal function and peritubal lesions. In the diagnostic laparoscopy the whole pelvis of the infertile case might be evaluated. The most important contribution of L/S is that it allows diagnosis and treatment during the same session.

The most common causes of tubal factor in female infertility are infection, surgery or adhesions developing secondary to infection.

Even though, the relationship between endometriosis and infertility in patients with minimal endometriosis and mild endometriosis is controversial, increased cytokines and growth factors in peritoneal fluid, activated macrophages might have toxic effects on

sperm function and embryo; and it has been suggested that in the endometriosis cases the presence of aberrant genes and their products in eutopic and ectopic endometrium might be responsible in the etiology of infertility<sup>(9-11)</sup>. In patients with advanced stage endometriosis breakdown of the tuba-ovarian relationship, degradation in the ovarian reserve and oocyte quality secondary to endometrioma is considered to be a priority in the etiology of infertility. The rate of endometriosis in the fertile cases is 4% (91% of them stage I-II, 9% stage III-IV), and in the infertile cases 33% (stage I-II: 58%, stage III-IV: 32%). In general, it has been accepted that the rate of endometriosis among the fertile cases is 5-10%, and the rate in the infertile patients is 20-40%. On the other hand, 30-50% of the cases with endometriosis face the problem of infertility<sup>(12)</sup>. According to the results of our study, in the 28.4% of patients endometriosis was observed in whom no tubal pathology with L/S was seen, his rate was 13.9% in patients with unilateral tubal factor, and 22.7% in cases with bilateral tubal factor.

Even though, there are opinions in the opposite direction, meta-analysis of 2 studies revealed that patients with minimal-moderate endometriosis who underwent L/S have statistically significant higher rates of live births- ongoing pregnancy rates<sup>(13)</sup>. Perquin et al. also reported that resection and ablation of pelvic adhesions and endometrial foci observed during the L/S increases the rates of pregnancy<sup>(14)</sup>.

The sensitivity of HSG in tubal occlusion is 65% and the specificity is 83%<sup>(10)</sup>. Among the patients that no pathology was observed with HSG bilateral tubal occlusion was detected in 5% of them with L/S, and 42% of the patients that bilateral tubal occlusion observed with HSG had no pathology with L/S<sup>(2,16)</sup>. According to our results, while no tubal pathology was observed with L/S in 61.2% of patients who were diagnosed as unilateral tubal occlusion in HSG, this ratio was 51.2% in patients with bilateral tubal factor. The reason of false positivity of tubal occlusion in HSG might be due to technical problems or tubal spasm.

L/S allows diagnosis and treatment at the same time for appropriate patients with tubal factor according to HSG. Moreover, additional pathologies such as endometriosis might be diagnosed and treated by L/S. Yuval Lavy et al. reported that L/S should be proposed to patients with bilateral tubal occlusion in their HSG.

30% of these patients might have open tubes<sup>(17)</sup>. The importance of this situation is the possibility of treatment of infertility before proceeding to the stage of in vitro fertilization.

Hysterosalpingography (HSG) is a first line technique for the assessment of infertile women. Laparoscopy on the other hand is a invasive, but gold standard for the assessment of tubal occlusion.

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