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# Combined Office Operative Hysteroscopy and Sono-Hystero Salpingography: A new approach in the management of infertile women with bilateral Proximal Tubal Block

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## ABSTRACT [ENGLISH/ANGLAIS]

Proximal tubal block is a major cause of infertility in females that can be due to spasm, mucal plug, clot etc, which remains a challenging disorder for both the physician and the patient. In the present study evaluation of the effectiveness of Combined office operative hysteroscopy and Sono-hystero salpingography (COOH-SSG) a new technique in the management of infertile women with bilateral proximal tubal blockage (PTB) is done to find out the tubal recanalization rate, pregnancy outcome and the possible complications. A total number of 3124 couple approached for diagnosis and treatment of infertility from 2005 to 2009 of which 2622 women underwent hystero salpingography. Among them, diagnosis of 312 females revealed bilateral PTB and 154 women underwent tubal recanalization by COOH-SSG. Tubal recanalization was done by using catheter and guide wire under Hysteroscopy guidance. Sono-Hystero Salpingography was preformed for testing the tubal patency. Rate of successful tubal recanalization, pregnancy outcome and complications were measured. Among 2622 females 154 patients with bilateral PTB underwent tubal recanalization by COOH-SSG. Out of these, 114 (74.03%) women had successful recanalization with at least one tube patent. In the present study out of 114 patients 55 (35.71%) women were confirmed with successful pregnancy. COOH-SSG is safe, less invasive, economical, time saving and can be done as outpatient procedure. The recanalization can be confirmed on the spot by Sono-Hystero Salpingography.

**Keywords:** Female Infertility, Proximal tubal block, COOH-SSG, Tubal recanalization

## RÉSUMÉ [FRANÇAIS/FRENCH]

Proximale bloc des trompes est une cause majeure d'infertilité chez les femmes qui peuvent être due à un spasme, branchez mucal, etc caillot, qui reste un trouble difficile tant pour le médecin et le patient. Dans la présente étude d'évaluation de l'efficacité du combiné opératoires bureau hystérocopie et Sono-hystéro salpingographie (COOH-SSG) une nouvelle technique dans la gestion des femmes stériles avec obstruction tubaire bilatérale proximale (PTB) est fait pour connaître le taux de recanalisation tubaire, issue de la grossesse et les complications possibles. Un nombre total de 3124 couple s'approchait pour le diagnostic et le traitement de l'infertilité de 2005 à 2009 dont 2622 femmes ont subi hystéro salpingographie. Parmi eux, le diagnostic de 312 femmes a révélé PTB bilatéraux et 154 femmes ont subi une recanalisation tubaire par COOH-SSG. Recanalisation tubaire a été réalisée en utilisant un cathéter et le fil-guide sous la direction de l'hystérocopie. Sono-Hystéro salpingographie a été préformés pour tester la perméabilité des trompes. Taux de recanalisation tubaire réussie, issue de la grossesse et les complications ont été mesurés. Parmi 2622 patients avec 154 femelles bilatéraux PTB a subi une recanalisation tubaire par COOH-SSG. Sur ce nombre, 114 (74,03%) des femmes avaient une recanalisation réussie avec au moins un brevet tube. Dans la présente étude sur 114 patients de 55 (35,71%) des femmes ont été confirmés avec une grossesse réussie. COOH-SSG est sûr, moins invasive, économique, gain de temps et peut être fait comme en ambulatoire. La recanalisation peut être confirmé sur place par Sono-Hystéro salpingographie.

**Mots-clés:** Infertilité féminine, proximale des trompes de bloc, COOH-SSG, recanalisation tubaire

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## INTRODUCTION

The causative factors for infertility in females are cervical, uterine, tubal, ovarian, hormonal and pelvic disorders wherein tubal blockage has been identified as the single most common cause from the past two centuries [1]. It has

been estimated that around 25% to 35% females are infertile due to tubal blockage [2, 3, 4]. The proximal tubal block (PTB) is a challenging problem for the doctors who deal with the management of infertility. Therefore several techniques have been developed for the treatment of PTB

from past two centuries and these methods include macro-surgical tuboplasty [5], microsurgical tuboplasty [6] laparoscopic tuboplasty [7], radiological approach – fluoroscopic trans cervical tubal recanalization [8], sonographic approach – abdominal and trans vaginal ultrasound guided recanalization [9], hysteroscopic recanalization [10] and hysteroscopic recanalization under laparoscopic guidance. Each of these techniques has its own advantages and disadvantages hence the success of achieving tubal patency and pregnancy varies from technique to technique.

Hysteroscopic recanalization has the advantage of direct visualization of the ostia, but can not confirm the tubal patency on the table [11]. Hysteroscopic recanalization under laparoscopic guidance is more invasive and requires general anesthesia, hospitalization and also more expensive. In this view an attempt was made to combine these two techniques carried out in one single sitting which will be an added advantage to produce better result than any one of the procedures alone. No such studies have been carried out till date, wherein two techniques, namely Combined office operative hysteroscopy (COOH) and Sono-hystero salpingography (SSG) guided tubal recanalization are combined as a single procedure (COOH-SSH). Both hysteroscopy and SSG have been found to be very useful tools because hysteroscopy gives close visualization of uterine cavity and the ostia and SSG is useful for confirming the tubal patency in the diagnosis and management of PTB. In this view the present study was carried out in Mysore, Karnataka, India, to evaluate the effectiveness of COOH-SSG tubal recanalization rate, pregnancy outcome and possible complications.

## MATERIALS AND METHODS

This is an observational study of 3124 couple receiving infertility treatment from September 2005 till February 2009 at the Mediwave IVF and Fertility Research Hospital (MIVFRH), Mysore, Karnataka, India. Among the consecutive unselected infertile women who came for investigation and further treatment, only the positive cases for Hystero salpingography (HSG) reported as bilateral PTB have been recruited for the study. Demographic and patient-related data (which include age of the patient, body mass index during the period of infertility, etc) were obtained. Out of 3124 patients, 2622 (83.93 %) underwent HSG, among them 531 (20.25 %) had bilateral tubal blockage and 271 (10.34 %) had unilateral tubal block. Out of 531 bilateral tubal blocks, 312 patients

(11.9 %) had bilateral PTB (Figure 4) and 219 patients (8.6 %) had bilateral distal blocks. All the 312 women with bilateral PTB were offered COOH-SSG treatment. No selection criterion was adopted while choosing the cases still, only 164 patients who accepted to undergo COOH-SSG treatment were taken up for tubal recanalization by COOH-SSG technique. In ten patients, the procedure could not be completed. Finally, 154 (93.90 %) patients completed the procedure. Male factors were also analyzed according to WHO [12] protocol and the type of infertility was recorded if it exist, consequent fertility treatment were provided, and pregnancy outcomes were measured.

## Exclusion Criteria

Women with unilateral tubal block, mid and distal blocks and who had undergone sterilization procedures like tubectomy or tubal ligation, bilateral salpingectomy and women with previous sterilization and females with acute vaginal infections, acute pelvic inflammatory diseases were excluded.

## Interventions

Cervical dilatation was performed under intravenous sedation or local cervical block. The tubal recanalization was done using Novys catheter and guide wire under hysteroscopic guidance. Selective salpingography of both the fallopian tubes was done using saline under hysteroscopic vision. Agitated mixture of saline was injected into the uterus using Foleys catheter. Peritoneal spillage was studied by using Trans Vaginal Sonography (TVS). Stats direct software was used for all statistical analysis.

## RESULTS

Table 1 shows the distribution of the 154 individuals with different age range, Body Mass Index (BMI) and infertility duration who under gone COOH-SSG (n = 154). Out of total 154 couple, 73(47.4%) male partners were normal, 54(35.06%) had Oligospermia and 27(17.53%) had Azoospermia. Out of 154 patients with bilateral PTB, 83 (53.9 %) resulted in Bilateral Patent Tubes (BPT), 31 (20.13 %) resulted in Single Patent Tube (SPT) after the recanalization by COOH-SSG technique. Figure 1 shows the normal patent Fallopian tubes observed through Hystero salpingography (HSG). Uterus and both the tubes are seen filled with the dye in the first film. Bilateral Peritoneal spillage of the dye is seen in the second film.

Uterus is visible and both the tubes are not filled with the dye. No peritoneal spillage of the dye is seen in the pelvis (Figure 2). Figure 3 shows the full set up of COOH and SSG equipment. Comparison of COOH-SSG with different techniques to achieve successful pregnancy in females with tubal blockage shown in the table 2. Out of 154 women who underwent the procedure, 114 were successfully treated. Around 55 women with at least one tubal Patency (Tube Patent Group) became pregnant within four months of recanalization with successive treatment. Among them 39 had live birth pregnancy, subsequent pregnancy was observed in two women for the second time after successful delivery of singlet baby. No major complications were observed in any of the cases.

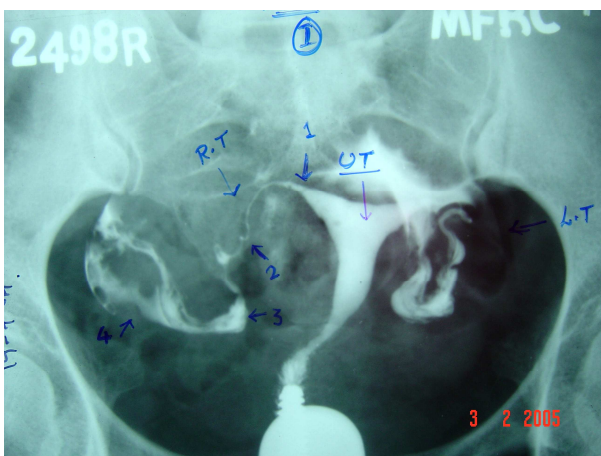
**TABLE 2**

Table 2 shows the of different techniques with COOH-SSG to achieve successful pregnancy in females with tubal blockage (PR = Pregnancy Rate)

Technique	Number of Patients	Total PR	On Going PR	Spontaneous Abortion (%)	Ectopic PR	Reference
Macrosurgery	104	36.5	22.1	6.7	7.7	Gerard et al. [13]
Microsurgery	175	58.9	47.4	4	7.4	
Radiological	482	21.37	10.58	2.49	1.24	
Hysteroscopy	133	48.9	16.54	6.7	4.4	
COOH- SSG	154	35.71	30.52	3.9	1.3	

**FIGURE 1**

Figure 1 shows normal patient's fallopian tubes as seen in HSG. Uterus and both the tubes are seen filled with the dye in the first film. Bilateral Peritoneal spillage of the dye is seen in the second film.



UT = Uterus, R.T + Right tube. L.T + left tube. 1 = Proximal, 2 = Middle, 3 = Distal portion. 4 = Peritoneal spillage of the dye.

**TABLE 1**

Table 1 shows the distribution of the 154 individuals with different age range, Body Mass Index (BMI) and infertility duration who under went Combined Office Operative Hysteroscopy and Sono-Hystero Salpingography (COOH-SSG) (n = 154)

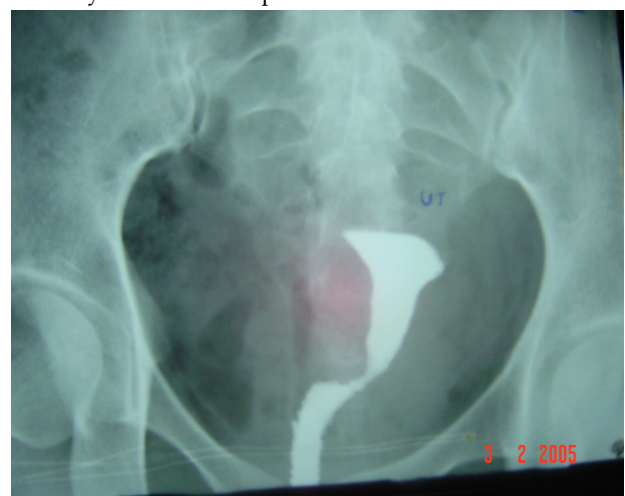
Characteristics	Range	Mean ± SD
Age in years	18-41	28.92±4.82
BMI in kg/m <sup>2</sup>	16.67-31.89	23.92±3.33
Duration of infertility in years	1-21	6.82±4.06

**DISCUSSION**

In this study out of 154 patients who underwent COOH-SSG, 70% successful tubal recanalization of at least one tube was achieved. The total PR achieved by this

**FIGURE 2**

Figure 2 shows hystero salpingography showing bilateral Proximal Tubal blockage (PTB). Uterus is visible and both the tubes are not filled with the dye. No peritoneal pillage of the dye is seen in the pelvis.





**FIGURE 3**

Figure 3 shows Full set up of COOH and SSG procedure. From left – ultrasound scanner, Computer, pressurized drip set stand, hysteroscopic set stand, patient in situ and surgical equipments.



technique is 35.71 %. This is also reasonably good success rate compared to any other technique described earlier. Previous studies have suggested that the number of patent tubes after the procedure may have an impact on the pregnancy rate [14, 15].

Better conception rate with bilateral tubal patency was noted. A total PR of 55.42 % in bilateral patent group was obtained. Whereas PR was 29.03% in unilateral patent group. Thus PR was significantly higher ( $p < 0.05$ ) in bilateral patent group than in the unilateral patent group. All conceptions were not carried to term and it is not clear which factors negatively impacted term pregnancy in the different techniques of tubal recanalization. The pregnancy loss due to all the reasons in this study is 5.19% including 1.3% ectopic pregnancy. The rate of ectopic pregnancy reported in this study is comparable to the studies done by other workers using non surgical methods of recanalisation [16, 17].

The patient acceptability was good for the COOH-SSG procedure compared to IVF, COOH-SSG procedure which is more economical, less invasive and gives better pregnancy rates. In total 5.19 % complications were observed, and they were effectively treated. Although tubal block is an indication for IVF, the latter procedure is expensive and the associated pregnancy rate is only about 20%–40%. COOH-SSG is useful for evaluating and treating tubal status after HSG and should be performed before IVF is considered. Moreover, COOH-SSG may

prevent unnecessary surgical canalization for tubal obstruction falsely diagnosed by HSG. In addition to reliable diagnosis, COOH-SSG offers the opportunity to directly visualize and treat the PTB

Kamiyama et al. [18] observed a significantly higher PR among infertile women with patent tubes on HSG, who underwent Selective Salpingography and Tubal Catheterization (SS-TC) under hysteroscopic guidance, in comparison with a control group that did not undergo the procedure [18]. PTB reductions achieved by tubal canalization will improve the pregnancy rate [9]. Therefore, the results of this study strengthens the case for further investigation of the role of COOH-SSG as a first-line of treatment for PTB in the management of infertility. The hydrotubation procedure done using saline will further help to flush the tubes.

**CONCLUSION**

In conclusion, the results of COOH-SSG technique emphasize the ease, cost effectiveness and safety of this method, encouraging its use in patients with PTB either as the sole therapeutic approach or in association with other assisted conception treatment.

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#### CONFLICT OF INTEREST

No conflict of interest was declared by authors

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