

# Hysteroscopic Tubal Cannulation: Our Experience

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## Summary

Proximal tubal obstruction is associated with 10-20% of cases of tubal infertility. Traditional methods of surgical correction of proximal tubal obstruction are invasive, tedious and do not have encouraging results.

We present our experience of 60 cases of hysteroscopic tubal cannulation with laparoscopic guidance, performed between Feb'94 to Feb, 2000. We could cannulate at least one tube in 74% cases and had 40% pregnancy rate. Ten percent of cases had tubal perforation during the procedure with no serious consequence. Hysteroscopic tubal cannulation is effective for treatment of proximal tubal obstruction besides being far less invasive than traditional laparotomy and much cheaper than IVF

## Introduction

Transvaginal cannulation of fallopian tube and transcervical balloon tuboplasty (Confino et al 1986) has attracted a great deal of interest in recent years. Proximal tubal obstruction is associated with 10-20% of cases of tubal infertility (Sulak et al 1987). Such obstruction could be caused by uterine fibroids, peritubal adhesions, infections, intratubal disease (endometriosis, salpingitis isthmica nodosa, infection) etc. resulting in intraluminal debris, intraluminal adhesions, stenosis, fibrotic occlusions etc.

Traditional methods of correction of proximal tubal obstruction includes macro/microsurgical tubal implantation or tubo-tubal anastomosis. But, most of these procedures are invasive, tedious and do not have encouraging results.

The major attraction of the transvaginal approach for oviductal cannulation is that it utilizes the

external access route of the reproductive tract and thus avoids the need for incisional surgery. It can be performed using tactile, ultrasonic (Lisse & Sydow 1991; Stern et al 1991) fluoroscopic, falloposcopic (Kerin et al 1990) or hysteroscopic (Daniel & Miller, 1987) techniques. Potentially, many of these could be performed as office procedures with little or no analgesia, at less cost and greater convenience to the patient.

Hysteroscopic cannulation, especially with simultaneous laparoscopy is an excellent option for tubal cannulation performed under direct vision. Simultaneously diagnosis and correction of other infertility related causes may be carried out.

## Relevant Anatomy and Principle

The normal intramural oviduct ranges from 1.5 – 2.5 cms in length and takes a straight to slightly curved course to the utero tubal junction. It is 0.8 – 1.2 mm in diameter and can accommodate a cannula of 1.0-1.2 mm

in diameter without epithelial damage. Each ostium is situated at the apex of the uterotubal gutter and can be seen hysteroscopically at the bottom of a saucer-shaped depression as a sharp membranous ring which measures 0.8–1.2 mm in diameter. Therefore, if one passes a flexible, smooth-walled, J-shaped directional cannula through the internal os and directs it towards the left or right, it will follow the utero-tubal gutter towards the respective tubal ostia.

A description and illustration of the passage of a wire probe through the intramural segment of the human oviduct using a transvaginal approach was first published by Gardener in 1856. Since then bioengineers have custom designed and miniaturized guidewires, cannulas & flexible endoscopes. Less flexible cannulas and endoscopes will tend to get stuck in the intramural bulge as it narrows about 1-1.5cms. beyond the ostia. Hence the importance of over the wire or coaxial cannulation systems to keep the lumen coaxially aligned with the tubal lumen, for advancement. Smaller cannulas with diameter of 0.6mm may negotiate most intramural lumens without coaxial assistance. Greater attention to coaxial alignment is necessary during hysteroscopic cannulation techniques as the distension medium converts the uterine cavity into a three-dimensional structure. The isthmus portion of oviduct commonly takes a 40-60 degree bend as it extends beyond the uterotubal junction and is a potential site for tubal perforation.

## Materials and Methods

We performed hysteroscopic cannulation along with concurrent laparoscopy in 60 cases between Feb. '94 and Feb. 2000 for correction of proximal tubal obstruction. In all cases preoperative hysterosalpingography helped in case selection. Patients had already undergone diagnostic evaluation by laparoscopic chromopertubation. Presence of active genital tract infection & genital Koch's are contraindications to the procedure. The patient is explained about the procedure in details.

Age of the patients ranged from 22-38 yrs. Out of 60 cases 42 had secondary infertility and 18 primary infertility. Duration of infertility ranged from 18 months to 12 years.

In all cases the procedure started with a diagnostic laparoscopy, followed by cannulation with an operating hysteroscope Hopkins II (Karl Storz, Germany) with simultaneous laparoscopic control. Distending medium used was Ringer's lactate or normal saline.

We tried 7 different types of devices, out of which Novy's platinum tipped guidewire and curved cannula were better when cost was not a consideration. Fine Terumo guidewire with regular tubal catheter was more economical. In Novy's coaxial system, Novy et al (1988), outer catheter is J-shaped, i.e. 3 cms of tip is curved with 30–40 degrees angulation. Inner cannula is thin & flexible with centimeter markings. The guidewire is platinum tipped and guides the whole device.

To begin with, guidewire is loaded into inner cannula and this is loaded in the outer catheter. This whole system is loaded into outer channel of the hysteroscope in such a way that its curve is at right angle to the optics of 30 degree hysteroscope, so later when we see towards the right, cannula points to right ostia ready to be wedged at the right ostium allowing entry of inner cannula and guide-wire into the right tube by fine movements at proximal end of the operating channel of hysteroscope. At this time, we can monitor the movement of the cannula in the tube through the laparoscope. If there is any resistance to the movement of the cannula, it is withdrawn and reentry is made at a slightly different angle. Forceful negotiation is avoided and the procedure is abandoned on that side for fear of tubal perforation. We need to cannulate only 2-3 cms of proximal tube. Once this is accomplished, the cannula is withdrawn under vision followed by the guide wire. Following this, selective salpingography is performed through the outer catheter and flow of dye is monitored laparoscopically. Same procedure is repeated on the contralateral side.

## Results

Out of 60 cases in whom hysteroscopic cannulation was performed atleast one tube could be cannulated in 44 cases (74%). In 9 cases, cannulation was unsuccessful and procedure was abandoned.

Other operative procedures performed along with hysteroscopic cannulation were myomectomy, polycystic ovarian drilling, treatment of endometriosis and laparoscopic & hysteroscopic adhesiolysis. Complications encountered were 6 cases (10%) of tubal perforation with no significant consequences.

Twentyfour patients (40%) conceived. There was no ectopic pregnancy or abortion.

## Discussion

Hysteroscopic cannulation is an effective option for proximal tubal obstruction. The transvaginal approach avoids the need for incisional surgery and the whole procedure is performed in a simple manner, under

magnification with a certain degree of skill. Initially, we tried seven different types of devices out of which Novy's coaxial system was found very effective, but expensive. Also it is not reusable because the platinum tip wire has a memory. Terumo guidewire with regular out flow catheter was also used when cost was a consideration. This can also be reused after soaking in cidex solution.

Tubal implantation & tubo-tubal anastomosis performed conventionally for proximal tubal obstruction are not only very tedious procedures, but also have the inherent disadvantages of an abdominal incision & post-operative adhesion formation. Results are also not very encouraging.

Results of hysteroscopic cannulation range from 20-30%. Our pregnancy rates were 40% with no ectopic pregnancy to date. Variables affecting pregnancy success were not only related to the skill of the surgeon & procedure, but also on severity of tubal disease, presence of other aetiological factors of infertility etc. Concurrent use of laparoscopy allowed us to treat other coexisting conditions simultaneously. Existence of distal tubal disease, worsened the prognosis significantly.

#### Conclusion

Hysteroscopic tubal cannulation is an effective, useful & safe alternative for treatment of proximal tubal

obstruction. Concurrent laparoscopy allows diagnosis and treatment of other related disorders and makes it a safe procedure. There are no complications of much significance associated with this procedure. In future, this should continue to develop as a safe and effective technique for treatment of proximal tubal obstruction better than conventional laparotomy and much cheaper than IVF.

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