

# Minilaparotomy Tubal Recanalisation and Tuboplasty

Sharma J.B., Malhotra M., Arora R.

Department of Obstetrics and Gynecology, Maulana Azad Medical College and Affiliated Lok Nayak Hospital, New Delhi - 110 002.

**Objective** – To determine the safety and efficacy of minilaparotomy technique for tubal recanalisation and tuboplasty operations. **Methods** – This was a prospective study on 44 women who were successfully operated upon by minilaparotomy technique (incision < 6 cm) for reversal of sterilization (24 women, group I) or tuboplasty in infertility cases (20 women, group II) performed over 3 year period. Microinstruments, constant irrigation and loop magnification were used by the surgeon. **Results**– The mean operating time was 85 minutes in group I and 64 minutes in group II. The mean blood loss, hours of immobility, starting normal diet and hospital stay were 38 ml and 45 ml, 6 hours and 8 hours, 1.2 days and 1.5 days, 3.2 days and 3.1 days respectively in the two groups. Intrauterine pregnancy rate was 41.6% and 20% while ectopic pregnancy rate was 8.33% and 15% in group I and II respectively. The postoperative complications were minimal and were paralytic ileus, fever, wound infection, UTI and urinary retention in 1,2,2,2,1 and 2,2,2,1,2 cases in group I and II respectively. **Conclusion** - Minilaparotomy in selected group of patients appears to be a very safe, easy and feasible method for tubal surgery with the advantage of early discharge with minimal postoperative complications and without the need of expensive equipments.

**Key words :** minilaparotomy, recanalisation, tuboplasty

## Introduction

Tubal surgery is traditionally done by laparotomy route. Microsurgical tubal anastomosis has become the standard of care in tubal reapposition and repair in women who have had previous voluntary sterilisation.<sup>1</sup> Outpatient surgery is coming into vogue as a cost effective method for many gynaecological procedures like operative hysteroscopy, laparoscopic vaginal hysterectomy and tuboplasty<sup>2,3</sup>. Laparoscopic or combined laparoscopic hysteroscopic techniques have been used for tubal anastomosis but results have been poor<sup>4</sup>. Minilaparotomy has been an established technique for sterilisation operations<sup>5,6</sup>. It has also a role in ovarian cysts, ectopic pregnancy, hysterectomy and reversal of sterilisation<sup>7-10</sup>. We report the results of our 44 patients in whom tubal surgery was performed by minilaparotomy incision.

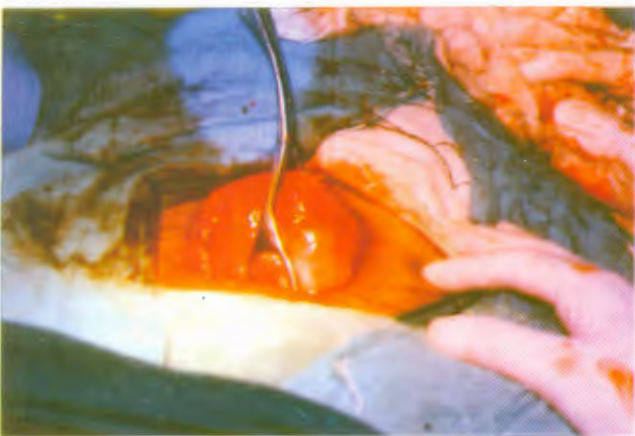
## Material and Methods

From June 1997 to June 2000 a total of 44 women requiring tubal surgery for reversal of sterilisation (group I) and tuboplasty for tubal infertility (group II) where the surgery was performed by minilaparotomy technique constitute the present study. The patients in group II had refused to opt for in-vitro fertilisation due to high cost. Preoperative evaluation of couples included routine blood testing,

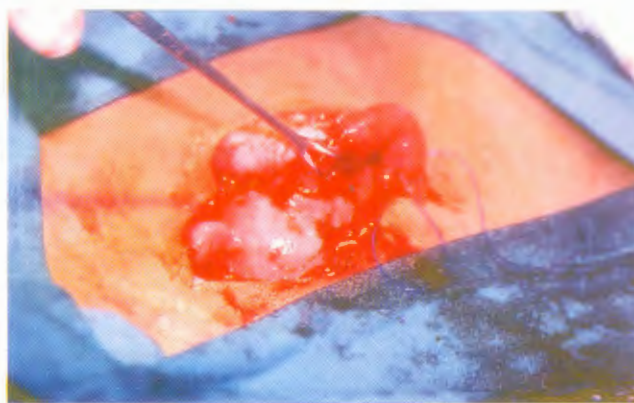
x-ray chest to rule out tuberculosis, husband's semen analysis, endometrial biopsy for ovulation for excluding endometrial tuberculosis and hysterosalpingogram or laparoscopy with dye testing to confirm the blocked tubes. All patients were given general anaesthesia. Bladder catheterisation was performed. Another number 14 foley's catheter was inserted into the uterine cavity and the bulb inflated. The catheter was slightly withdrawn so that the inflated bulb could get fixed at endocervix thus blocking the cervix completely to avoid any leak. The end of this catheter was left near the abdominal incision covered in sterile drapper. The abdomen was opened by a 4 to 6 cm. suprapubic transverse incision in the skin and opening the abdomen using Cohen's technique (tearing rectus sheath with fingers laterally and opening peritoneum with fingers). The fundus of the uterus was exteriorised using two fingers of right hand and one fallopian tube was exposed at a time for tubal recanalisation. Atraumatic uterine holding clamp devised by the author was used in last 12 cases to exteriorise the uterus while performing recanalisation or tuboplasty (Photograph 1). Whole procedure of recanalisation or tuboplasty was virtually performed outside the abdominal cavity (Photograph 2). No packs or retractors were used. Uterine holding clamp was used in cases where it was difficult to keep the uterus extriorised. The surgical field was irrigated intermittently with heparinised ringer lactate solution. The blocked segment of the fallopian tube was excised using scissors. The dye (methylene blue) was injected using intrauterine Foley's catheter until it was seen coming out through

Paper received on 1/2/02 ; accepted on 11/5/02

Correspondence :  
A1/61, Azad Apartment,  
Sri Aurobindo Marg,  
New Delhi - 110 016 (India)



Photograph 1 : Uterus being exteriorised using author's uterine holding clamp.



Photograph 2 : Recanalisation being performed on an exteriorised fallopian tube.

the medial cut segment of the tube. Fine epidural catheter was inserted through the fimbrial end of the tube and then through the medial segment of the tube into the uterine cavity to facilitate recanalisation. The muscularis of the tube was stitched together using interrupted 6-0 polyglactin (vicryl) suture with magnification. The serosa and mesosalpinx were stitched with interrupted 5-0 polyglactin (vicryl) suture. Uterus and fallopian tube were positioned back into the peritoneal cavity. The epidural catheter was gently pulled out. The same procedure was repeated on the other fallopian tube after exteriorising the same. Patency of the tubes was confirmed by injecting dye through the intra-uterine Foley's catheter which

could be seen oozing out through the fimbrial end. The uterus and the tube were then gently pushed back into the pelvis. Visceral or parietal peritoneum were not stitched. Rectus sheath was closed using continuous 1-0 polyglycolic (vicryl) suture and the same suture was continued as subcuticular skin suture. Subcutaneous local anaesthetic was infiltrated at incision site. Other 20 patients underwent tuboplasty in the form of adhesiolysis, fimbrioplasty, segmental resection and anastomosis depending upon the situation using microsurgical instruments, magnification and irrigation. All patients received prophylactic antibiotic in the form of single 1.2 gm.

Table I : Characteristics of patients in tubal recanalisation and tuboplasty cases

		(Tubal recanalisation)		(Tuboplasty)			
No. of cases				24	20		
1.	Age (years)						
	Range	24-36		21-35			
	Mean	29.5		25.4			
2.	Parity						
	Range	2-5		0-3			
	Mean	2.5		1.3			
		No.	Percent	No.	Percent		
3.	Indication:	(a) Death of one or more children		24	100	-	-
		(b) Infertility		-	-	20	100
	(i) Previous laparoscopic sterilization with Falope's rings	18	75	-	-	-	-
	(ii) Previous minilap sterilization	4	33.32	-	-	-	-
	(iii) Previous caesarean sterilization	2	16.66	-	-	-	-
	(iv) Previous infertility with blocked tubes	-	-	-	-	12	60
	(v) Secondary infertility with blocked tubes	-	-	-	-	8	40

intravenous coamoxyclav (augmentin) before the operation. High risk patients were given three doses of coamoxyclav. Patients with infection or fever were given alternative antibiotics depending upon sensitivity.

Postoperatively patients were given intravenously 2 liters of fluid on day of operation. Injection diclofenac 50 mg. i.m. was given for pain whenever necessary. Oral clear fluids were started in 6 hours. Semisolid diet was started from second day and normal diet from

**Table II : Showing operative Details in Tuboplasty and recanalisation cases**

	Group I (Tubal recanalisation)		Group II (Tuboplasty)	
	No.	%age	No.	%age
1. No. of cases	24		20	
2. Incision				
Transverse	24	100	20	100
Cohen's technique	24	100	20	100
Length of Incision				
4 cm.	18	75	16	80
5 cm.	4	16.66	2	10
6 cm.	2	8.33	2	10
3. Anaesthesia				
General (Endotracheal)	24	100	20	100
4. Estimated blood loss (ml)				
Range	10-60		15-100	
Mean	38		45	
5. Operating time (minutes)				
Range	58-122		32-98	
Mean	85		64	
6. Operative procedure				
(i) Tubal recanalisation (resection anastomosis)	24	100	3	20
(ii) Adhesiolysis	4	16.66	16	80
(iii) Fimbrioplasty	0		4	20
(iv) Salpingostomy	0		3	20

Note: Some patients had more than one procedure.

third day onwards. Patients were discharged on 3<sup>rd</sup> or 4<sup>th</sup> day if there were no complications and were seen in the clinic after 2 weeks.

## Results

Out of total 44 women, 24 underwent tubal recanalisation (group I) while 20 underwent tuboplasty (group II). Characteristics of patients are shown in Table I. Mean age was 29.5 years and 25.4 years and mean parity was 2.5 and 1.3 respectively in the two groups. Death of one or more children after sterilisation operation was the reason for request for recanalisation in group I. Previous sterilisation was laparoscopic sterilisation with Falope's ring in 18 (75%) cases, minilap sterilisation with Pomeroy's

technique in four cases (16.66%) and caesarean sterilisation in two cases (8.33%). In group II, 12 women (60%) had primary infertility with blocked tubes while eight women (40%) had secondary infertility with blocked tubes.

The operative details of the patients are shown in Table II. Incision given was transverse and technique used was Cohen's in all cases. Length of incision was 4 cm in majority of cases (75% and 80% respectively in group I and group II). General anaesthesia was given to all the cases. Mean estimated blood loss was 38 ml in group I and 45 ml in group II, while mean operating time was 85 minutes and 64 minutes respectively in the two groups. The procedure performed was tubal recanalisation (resection of blocked tube and

Table III : Showing Peroperative and postoperative details in tuboplasty and recanalisation cases

	Group I (N= 24) (Recanalisation Group)		Group II (N=20) (Recanalisation Group)	
	No.	%age	No.	%age
1. Antibiotics				
i) Inj. Coamoxyclav (augmentin)				
(a) 1.2 gm single dose I.V.	18	75	14	70
(b) 3 doses I.V.	6	25	6	30
ii) Cap. Ciprofloxacin 750 mg BDx 7d. ( Postoperative fever & UTI). (Some patients were given more than one antibiotic)	4	16.66	4	20
2. Pain relief: Inj. Diclofenac 50 mg I.M. (No. of injection)				
Range	2-7		2-8	
Mean	3.2		3.5	
3. Complications				
i) Paralytic ileus	1	8.33	2	10
ii) Fever	2	16.66	2	10
iii) Wound infection	2	16.66	2	10
iv) UTI 2	16.66	1	0	
v) Urinary retention	1	8.33	2	10
vi) Repeat laparotomy	0	0	0	0
vii) Readmission	0	0	0	0
4. Hospital stay (day)				
Range	2.5-9		2.5-8	
Mean	3.2		3.1	
5. Intrauterine pregnancy	10	41.66	4	20
6. Ectopic pregnancy	1	8.33	3	15

anastomosis) in all 24 (100%) cases with additional adhesiolysis in 4. In group II 16 (80%) women required adhesiolysis, while 3 women required resection anastomosis, 4 required fimbrioplasty and 3 needed salpingostomy. Some patients needed more than one procedure.

The peroperative and postoperative details are given in Table III. All women were given prophylactic intravenous coamoxyclav (augmentin) either as single dose (75% and 70% causes) or 3 doses (25% and 30%). In addition 2 patients in each group were given added ciprofloxacin for postoperative fever or would infection. Inj diclofenac (voveran) 50 mg intramuscularly was given to all women for pain relief. Mean requirement was 3.2 injections in group I and

3.5 injections in group II respectively. The postoperative complications were fever, wound infection and UTI in one patient each in group I and paralytic ileus, fever wound infection and urinary retention in one patient each in group II. Mean hours of mobility were 6 and 8 respectively in the two groups, while mean day of starting normal diet were 1.2 days and 1.5 days respectively in the two groups. Mean hospital stay was 3.2 days in recanalisation cases and 3.1 days in tuboplasty group. Most patients were fit to be discharged on day 2 but they refused to go home due to social reasons and because they had come prepared to stay longer in hospital.

#### Discussion

Minilaparotomy has been successfully used to manage

ectopic pregnancies, ovarian cysts, tubal sterilization and cyclic hysterectomy. Present author uses minilaparotomy technique as far as possible for hysterectomy and surgery for ectopic pregnancy cases and has devised his own uterine holding clamp to extenrose the uterus during the procedure (Fig. 1). The standard technique of tubal recanalisation is by conventional laparotomy as laparoscopic and hysteroscopic techniques for it have not been very successful. Thus Sedbon et al. in their report of 5 cases using abn glue had no pregnancies while Reich<sup>12</sup> in his attempt over 20 anastomosis done by laparoscopic tubal reversal found only two subsequent term pregnancies and 3 ectopic pregnancies. Dyer and Tregoning<sup>13</sup> performed laparoscopic reconstructive tubal surgery over 177 cases of infertility in a tertiary referral centre in South Africa and observed a pregnancy rate of 36% with a live birth rate of 9% and ectopic pregnancy rate of 3.4%. They attributed this poor outcome to severity of tubal damage in their population due to mechanical obstruction. Slowey and Coddington<sup>14</sup> in their comparison of outpatient and inpatient minilaparotomy microsurgical reanastomosis found equal pregnancy rates and outcome in the two groups.

However, Daniell and McTavish<sup>10</sup> performed combined approach of laparoscopy and minilaparotomy and found it to be both safe and cost effective with pregnancy rate of 60%. They could accomplish it as day case procedure. Their complication rate was very low mostly a result of good microsurgical techniques, meticulous haemostasis, perioperative antibiotics and early ambulation and discharge from hospital. Others have also reported success with minilaparotomy recanalisation procedure<sup>11</sup>. The complication rate was very low in present study possible due to same reasons. The cases in the present study were done as inpatient cases and were fit to go home next day. The pregnancy rate was 46% in recanalisation group and 20% in tuboplasty group. The ectopic pregnancy rate was 8.33% and 15% in the two groups. The lower pregnancy rate was possibly due to lower follow up (some cases were done in last few months only) and non-availability of operating microscope in our hospital. The patients requiring tuboplasty had pathological tubes and high incidence of pelvic infections and tuberculosis which is responsible for poor pregnancy rate in this group. Low pregnancy rate in tuboplasty were also observed by Dyer and Tregoning<sup>13</sup> due to infection in their population. The pregnancy rate of the present series is almost equal to that after laparotomy in our hospital (mean pregnancy rate 45% in open laparotomy recanalisation; unpublished data).

## References

1. Gomel V. Microsurgical reversal of female sterilization: a reappraisal. *Fertil Steril* 1980; 33: 587 - 97.
2. Silva PD, Schaper AM, Musch JK, et al. Outpatient Microsurgical reversal of tubal sterilization by a combined approach of laparoscopy and minilaparotomy. *Fertil Steril* 1991; 55: 696 - 9.
3. Stovall G, Summitt RL, Bran DF, et al. Outpatient vaginal hysterectomy: a pilot study. *Obstet Gynecol* 1992; 80: 145 - 9.
4. Isin D, Mahmood D. Laparoscopic and hysteroscopic approach for tubal anastomosis. *J Laparosc Endosc Surg*. 1993; 3: 63 - 6.
5. Bluementhal PD. Laparoscopic sterilization in the supine position using the Ramathibodi uterine manipulator. *Fertil Steril* 1995; 64: 204 - 7.
6. Ruminjo JK, Lynam PE. A fifteen year review of female sterilization by minilaparotomy under local anesthesia in Kenya. *Contraception* 1997; 55: 249 - 60.
7. Flynn M, Niloff JM. Minilaparotomy for the ambulatory management of ovarian cysts. *Am J Obstet Gynecol* 1995; 173: 1727 - 30.
8. Hoffman MS, Lynch CM. Minilaparotomy hysterectomy. *Am J Obstet Gynecol* 1998; 179: 316 - 20.
9. Sharma JB. Minilaparotomy abdominal hysterectomy: a new surgical technique. *Obstet Gynecol Commun* 1999; 5: 28 - 31.
10. Daniell JF, McTavish G. Combined laparoscopy and minilaparotomy for outpatient reversal of tubal sterilization. *South Med J* 1995; 88: 914 - 16.
11. Sedbon E, Delajolinières JB, Boudouris O, et al. Tubal desterilisation through exclusive laparoscopy. *Hum Reprod* 1989; 4: 158 - 9.
12. Reich H. Laparoscopic reversal of sterilization (Abstract). *Second world Congress of Gynecologic Endoscopy Clermont-Ferrand, France, June 1989: 5 - 8.*
13. Dyer SJ, Tregoning SK. Laparoscopic reconstructive tubal surgery in a tertiary referral centre. A review of 177 cases. *S Afr Med J* 2000; 90: 1015 - 19.
14. Slowey MJ, Coddington CC. Microsurgical tubal anastomosis performed as an outpatient procedure by minilaparotomy are less expensive and as safe as those performed as an inpatient procedure. *Fertil Steril* 1998; 69: 492 - 5.
15. Haspel-Siegel AS. Fallopian tube anastomosis procedures to restore fertility. *AORN Journal* 1997; 65: 75 - 82 and 85 - 86.