

DOI: <http://dx.doi.org/10.18203/2320-1770.ijrcog20185181>

Original Research Article

Clinical study of factors affecting outcome of tubal recanalization using microsurgical techniques: a retrospective study

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Received: 20 November 2018

Accepted: 15 December 2018

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ABSTRACT

Background: In India, many couples complete their families by the age of 25 to 30 years and opt for tubal sterilization as a method of family planning in spite of availability of other spacing methods. Due to unforeseen circumstances, 10 % of them regret their decision and about 1% want to restore their fertility due to various reasons like loss of only child, loss of male child, desire to have more children, loss of children in natural calamities, remarriage and other socioeconomic factors. The objective of the present study was to analyze various factors which are involved in pregnancy rate in tubal recanalization.

Methods: 31 women undergoing microsurgical tubal recanalization by mini laparotomy in RRMCH, Bengaluru during a study period of 2 year from 2014 -2016 were followed up for a period of 2 years by telephonic conversation.

Results: An overall 67.7 % pregnancy rate was achieved with microsurgery technique.

Conclusions: The important factors determining the success of operation were age of the patient, method of previous ligation and the remaining length of tube after recanalization. The microsurgical technique should be available at specialized centres to improve the success of family planning services and also this could be the hope for hopeless.

Keywords: Microsurgery, Recanalization, Tubal sterilization

INTRODUCTION

In India, many couples complete their families by the age of 25 to 30 years and opt for tubal sterilization as a method of family planning in spite of availability of other spacing methods. The reason for tubectomy being the most popular method could be the preconceived myths and fears of temporary methods and the economic compensation being given as a part of national family planning program. Infact, according to NFHS(2015-2016) female sterilization accounted for 36% of all methods of family planning used in country but due to unforeseen circumstances, 10% of them regret their decision and about 1% want to restore their fertility due to various reasons like loss of only child, loss of male child, desire to have more children, loss of children in natural calamities, remarriage and other socioeconomic

factors.^{1,2} These women are otherwise fertile women, who have better chances of pregnancy than females with tubal pathology. They have the option resorting to ART or tubal recanalization through mini laparotomy or laparoscopic microsurgical anastomosis. The latter is limited to a few extremely skilled laparoscopic surgeons and ART is limited to the financially well-equipped patients. Therefore, in a developing country like ours, tubal recanalization using principle of microsurgery gives hope to many women as it can be done in a minimal resource setting.

METHODS

This is a retrospective study of 31 women undergoing tubal recanalization procedure in RRMCH, Bengaluru, during a 2-year study period from 2014 to 2016. All cases

were followed up for a period of 2 years. An informed consent was taken from all patients after counselling the couple regarding surgery and its success rate. Male factor was evaluated in all cases by husband semen analysis. All patients were operated between 7th to 10th day of menstrual cycle. Tubal microsurgery was performed under general anesthesia or spinal anesthesia. Principles of microsurgery was meticulously followed throughout the procedure. The occluded segment of tube was resected till there was complete excision of pathologic tissues. Precise alignment of tissue planes using atraumatic technique was carried out by using 6-0 vicryl on a round bodied microneedle. For end to end tubal anastomosis, four sutures at 12', 6' 3' and 9 O' clock were taken in muscularis and serosal layers. Mucosa was avoided.

Sutures were taken in such a way that knots faced the serosa. Final length of reconstructed tube was measured on each side. Heparinized NS (5000mcg/L) was used for constant irrigation. Hemostasis was achieved by precise electrocoagulation using bipolar cautery. The patency was assured intraoperatively by methylene blue injection. Abdomen was closed in layers after a peritoneal lavage Patient was given injection placentrixi.m for 10 days and discharged after a week. Sexual intercourse was allowed 2 months after the surgery. Three months post operatively HSG was performed to ascertain tubal patency. Subsequently, patients were followed 3 monthly or by telephonic conversation for a period of 2 years.

The results of the procedure were evaluated with respect to:

- Age
- Type of sterilization done previously
- Type of delivery
- Type of anastomosis
- Length of tube post operatively
- Tubal patency.

All these findings were analyzed in two groups:

- One who conceived
- One who did not conceive even after 2 years of follow up

Statistical analysis

All statistical analysis was performed using SPSS 22 version IPM SPSS statistics, somers NY, USA software. Categorical data was represented in the form of frequencies and proportions.

Chi -square test was used as test of significance for qualitative data. Graphical representation of data. MS excel, and MS word was used to obtain various types of graphs. Probability that the result is true; p value of <0.05 was considered as statistically significant after assuming all the rates of statistical test.

RESULTS

In this study, 31 women were included who underwent sterilization reversal, Tubotubal anastomosis was done bilaterally in all the patients. Patency of tube when determined by dye test and it was seen in at least one tube in all the 31 cases. 21 women conceived, out of 31 women with 67.7 % of pregnancy rate. In 70% of cases, death of all children was the main reason for sterilization reversal, and in 20% of cases, death of only male child was the cause. 10% of cases got sterilization reversal done as they wished to have more issues.

In this study, we are analysing various factors which affect pregnancy rate as only 21 conceived out of 31 women undergoing sterilization reversal, inspite of successful reanastomosis and patency of at least one tube. We are dividing the patients in 2 groups, group A: those who conceived, group B- those who didn't conceive. In this study (Table 1), 50% of cases conceived, between the age group of 20 -25 years. 84.6% cases conceived between age group 26-30 years and only 35.7 % of cases conceived between 31-35 years of age group. It shows that chances of pregnancy reduce after 30 years of age. There was statistically significant difference in age distribution between two groups with p value of 0.034.

Table 1: Association between age and outcome.

Age (year)	Total no. of patients	Who conceived	Who didn't conceive	χ ² , df, p value
20-25	6	2 (50%)	2 (50%)	6.743, 2, 0.034*
26-30	13	11 (84.6%)	2 (15.4%)	
31-35	14	5 (35.7%)	9 (64.3%)	

In the study (Table 2), out of 22 subjects who were delivered by FTND, 63.6% were conceived and 36.4% did not conceive. Out of 9 subjects who were delivered by LSCS, 44.4% were conceived and 55.6% did not conceive. There was no significant difference in Type of delivery with outcome.

Table 2: Association between type of delivery and outcome.

Type of delivery	No. of patients	Who conceived	Who didn't conceive	p value
FTND	22	14 (63.6%)	8 (36.4%)	0.966, 1,
LSCS	9	4 (44.4%)	5 (55.6%)	0.325

In the study (Table 3), among those who underwent Pomeroy's technique, 28.6% conceived and 71.4% did not conceive. Among those who underwent Fallope ring (Laprosopic sterilization), 70.8% conceived and 29.2% did not conceive. There was statistically significant difference in technique of sterilization distribution between two groups.

Table 3: Association between technique of sterilization and outcome.

Technique of sterilization	No of patients	Who conceived	Who didn't conceive	P value
Pomeroy's (open)	7	2 (28.6%)	5 (71.4%)	4.080, 1, 0.043*
Fallope ring (laproscopic)	24	17 (70.8%)	7 (29.2%)	

Table 4: Association between final length of tube and outcome.

Final length of tube (cms)	No of patients	Who conceived	Who didn't conceive	P value
< 5 cm	6	2 (33.3%)	4 (66.7%)	4.031, 1, 0.045*
>5 cm	25	19 (76%)	6 (24%)	

In the study (Table 4), Out of 6 subjects with length of tube <5 cm, 33.3% conceived and 66.7% did not conceive. Out of 25 subjects with length of tube >5 cm, 76% conceived and 24% did not conceive. There was statistically significant difference in length of tube with outcome. In the study (Table 5), out of 6 subjects with unilateral tubal patency, 66.7% conceived and 33.3% did not conceive. Out of 25 subjects with bilateral tubal

patency, 72% conceived and 28% did not conceive. There was no significant association between bilateral tubal patency and outcome. In the study (Table 6), out of 20 subjects with site at Isthmus-isthmus, 55.5% conceived and 45.5% did not conceive, out of 4 subjects with site at Ampulla-ampulla, 50% conceived and 50% did not conceive, out of 7 subjects with site at Isthmus-ampulla, 71.4% conceived and 28.6% did not conceive. There was no significant association between Site and outcome.

Table 5: Association between tubal patency and outcome.

Tubal patency	No of patients	Who conceived	Who didn't conceive	P value
Unilateral	6	4 (66.7%)	2 (33.3%)	0.0668, 1, 0.7961
Bilateral	25	18 (72%)	7 (28%)	

Table 6: Association between site and outcome.

Site	No. of patients	Who conceived	Who didn't conceive	P value
Isthmus-isthmus	20	10 (55.5%)	8 (45.5%)	0.665, 2, 0.716
Ampulla-ampulla	4	2 (50%)	2 (50%)	
Isthmus-ampulla	7	5(71.4%)	2 (28.6%)	

DISCUSSION

The pregnancy rate after reversal of sterilization by microsurgery reported by various authors varies from 57-84%.^{3,4} Boeckxstans et al claimed a cumulative pregnancy rate of 52 % in IVF group and 59.5% in surgical reversal group.⁵ This complies with present study which had a pregnancy rate of 67.7 % .Hwasook Moon et al , reported a pregnancy rate of 84.7 % using temporary loose parallel and quadrant suture technique.⁶ As we all know , age of the female is one of the most critical factors influencing the success of tubal recanalization.^{7,8,9} Women belonging to age group 26-30 years had a success rate of 84.6 % whereas the success rate fell down to 35.7% in women above the age of 30 years . This concurred with other studies which have reported significantly lower pregnancy rates in older women.^{8,10} Present study also showed a statistically significant difference in conception depending upon the previous

method of sterilization. 70.8 % (17/24) women who underwent laparoscopic sterilization conceived when compared to 28.6% of those who underwent sterilization by minilap and pomeroy's technique. This can be attributed to the lesser amount of tubal damage in laparoscopic techniques.^{11,12} The site of tubal anastomosis did not affect the pregnancy outcome in present study but factors like final length of tube after anastomosis had a significant difference on the outcome. 76 % of patients with final length of tube more than 5 cm conceived compared to only 33.3 % of those whose tubal length was less than 5 cm. This factor has been stressed upon by other studies as well like Yassae F et al and Eddy CA et al.^{13,14} Patency of tube determined by dye test, at least on 1 side is important to achieve a pregnancy outcome. In present study, 72 % of patients with bilateral patency conceived and 66.7% of patients with unilateral patency conceived. This signifies that bilateral patency of tube is not required for a statistically significant outcome.

CONCLUSION

Open tubal recanalization by microsurgical technique has comparable results with that of laparoscopic tubal anastomosis. We had a success rate of 67.7 % which was comparable to other studies. The age of the patient, type of sterilization performed and final length of tube were the important parameters which had a statistically significant impact on the outcome. So it is important to train ourselves in microsurgical techniques as we can cater to patients who opt for reversal belonging to lower income strata in a low resource setting and give them a reason to smile with positive outcomes at par with laparoscopic techniques or ART.

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: Not required

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Cite this article as: Rashmi AG, Singh S. Clinical study of factors affecting outcome of tubal recanalization using microsurgical techniques: a retrospective study. *Int J Reprod Contracept Obstet Gynecol* 2019;8:35-8.