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Thermational

**Original Research Paper** 

**Plastic Surgery** 

# Tubal Recanalisation: Still A Blessing For Fertility!

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ABSTRACT Background: Tubal ligation is most widely accepted method of permanent sterilisation in India. But due to some unfortunate events or life changes, women opt for reversal of tubal sterilisation. The objective of this study was to determine the pregnancy rate, live birth rate and factors affecting the outcome.

**Methods**: Tubal reconstruction microsurgery was done in 31 patients from 2014-2017 and patients were followed till 2019. Patients up to 40 years of age, variable duration after sterilisation and different methods of sterilisation were included. Baseline fertility workup, ultrasound and hysterosalpingography were done in all patients. Principles of microsurgery were meticulously followed.

**Results**: The overall conception rate was 61.29% with 73.68% of live births, 9.67% of spontaneous abortion and 6.45% of ectopic pregnancies.

Conclusion: Tubal recanalization is a ray of hope for patient's fertility following tubal ligation.

KEYWORDS : Tubal recanalization, Microsurgery, Laprotomy.

## INTRODUCTION

Tubal recanalization is a microsurgical procedure to bring back the patency of the fallopian tube. It requires significant training and handling of the tissues precisely. Patients undergoing tubal ligation as a permanent method of sterilisation are at times in need of the reversal surgery due to either death of children or remarriages. According to a study in 2009, 48.3% of married women were using contraception and about three-fourths of them had female sterilisation<sup>1</sup>. Nearly 1% of these require reversal techniques due to some life circumstances<sup>2</sup>

Different methods of tubal reconstruction have been proposed, such as open and laparoscopic microsurgery, conventional laparoscopy and robot-assisted surgery<sup>3</sup>. The main objective of the study was to analyse the conception rate and carry home baby rate accomplished by laparotomy and microsurgical technique. The factors affecting the outcome were also studied.

## METHODS

The study was conducted in the department of Obstetrics and Gynaecology, MGM Medical college, Navi Mumbai from 2014-2017. A total of 31 cases were studied and further followed up for 2 years up to 2019. A detailed history taking and examination of these patients was done. All the routine investigations required for major surgery and basic fertility workup including ultrasound, hormone assessment and hysterosalpingography was carried out in these patients.

## Exclusion criteria

Patients with other associated factors of infertility. Male factor infertility. Age. >40 years Women with contraindication to surgery.

## Technique

Under spinal or epidural anaesthesia, the abdomen was opened and uterus delivered out. Both tubes and ovaries were examined. Tubal ligation site identified on both sides and the edges were freshened. Under 4X loop magnification, tubal reconstruction done with 6-0 prolene in 2 layers. 1<sup>st</sup> layer by intermittent sub mucosal layer at 6 O'clock position i.e. mesenteric border and then at 3 O'clock, 9 O'clock and 12 O' clock. Similarly the serosa was approximated. Patency of tubes was checked by injecting methylene blue dye. Stent was not used. Continuous irrigation with heparinised ringar lactate solution was done. Inj Hydrocortisone 100 mg was given IV to all patients. Adhesiolysis was done by bipolar cautery in case of adhesions. Patients were discharged on postoperative day 3. Sexual intercourse was allowed in these patients after 3 months postoperatively. Pregnancy rate was evaluated in relation to age of the patient, previous tubal ligation techniques used, length of the recanalised tube and the site of anatomises.

## STATISTICAL ANALYSIS

Chi-square/Fisher exact test was used for statistical analysis of all the parameters on a categorical scale to compare two or more groups. p value < 0.05 was considered as statistically significant at 95% confidence interval.

#### RESULTS

**Age:** patients with age from 20-40 years were included in the study. The youngest patient was 23 years old and the oldest was 39 years old.

#### Table 1: Age groups

Age(Years)	No. of patients	Success	Statistical
	_	Percentage	Analysis
20-24	2	2(100%)	p-value= 0.4605
25-29	4	3(75%)	
30-35	18	11(61.11%)	
>35	7	3(42.28%)	

As seen in Table 1, maximum patients were in the age group from 30-35 years but the fertility was better achieved in younger population.

**Sterilisation-reversal interval:** Patients up to 10 years and more after sterilisation were involved in the study.

## Table2: Sterilization reversal interval

Years	No. of patients	Success	Statistical
		percentage	Analysis
<1 year	4	4(100%)	p-value=
1-5 years	18	14(77%)	0.0009
>5 years	9	1(11.11%)	

of More patients were seen after 1-5 years of family planning

GJRA - GLOBAL JOURNAL FOR RESEARCH ANALYSIS # 25

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surgery; however conception was remarkably observed in patients with less sterilisation reversal interval(100%, p=0.0009), as observed in Table 2.

Parity: Patients with all parity participated in the study.

#### Table 3: Parity of patients

Parity	No. of patients	Success	Statistical Analysis
Paral	4	4(100%)	p=0.0174
Para2	20	14(70%)	
Para3	4	1(25%)	
Para4 and more	3	0	•

As we analyse Table 3, it is seen higher number of patients with parity 2 were analysed in the study and success was seen more in patients with less parity.

**Cause for reversal surgery:** Reasons for tubal reconstruction surgery were analysed in the study.

#### Table 4: Reason for sterilization reversal

Causes	No. of patients	Success	Statistical Analysis
Remarriage	9	6(66.6%)	p=0.6943
Death of children	22	13(59.09%)	

Death of the children was the most commonest cause for ligation reversal surgery, however the cause hardly affected the results of the study.

**Type of Sterilisation technique:** Various Sterilisation techniques affecting the success of the study were analysed.

### Table 5: Sterilisation technique used

Technique	No. of	Success	Statistical
	patients		Analysis
Peurperal	10	6(60%)	p=0.00603
Interval Mini-lap	6	3(50%)	
LSCS with TL	5	1(20%)	
Lap TL	10	9(90%)	

As seen in the table 5, fertility was appreciably observed in patients who had undergone previous laparoscopic sterilisation(90%, p=0.00603).

Site of tubal anatomises: Depending upon the previous site of tubal sterilisation surgeries, anatomises were conducted in these patients

### Table 6: Anatomises site of tubal reconstruction

Site	No. of patients	Success	Statistical Analysis
Isthmo-isthmic	6	6(100%)	p-value
Isthmo-ampullary	13	7(53.84%)	=0.0299
Ampullo-ampullary	9	6(66.66%)	
Cuff- Salpingostomy	3	0	

A larger number of patients had Isthmo-amullary site for anastomosis, but pregnancy was seen more in patients with Isthmo-isthmic site(100%, p=0.0299) probably as it results in longer remaining tube, as studied in Table 6.

Length of the tube achieved: After performing the surgery, the length of the tube achieved was measured and its relation with the conception rate was analysed.

## Table 7: Length of tube achieved

Length	No. of	Success	Statistical	Carry	Ectopic	Abortion
of tube	patients	(Conception)	Analysis	home		
in cm				babies		
<4 cm	8	3 (37.5%)		0	2	1

4-6cm	11	6 (54.5%)		4	0	2
>6cm	12	10 (83.33%)	p-value	10	0	0

Conception rate was significantly higher (83.33%, p=0.0010) in patients with tubal length of > 6 cm.

**Reversal conception interval:** The duration from the reversal surgery to conception was measured and analysed.

## Table 8: Reversal conception interval

No. of months	No. of patients
< 6 months	10
6-12 months	6
12-18 months	3
18-24 months	0

Least interval with which pregnancy was reported was 4 months. Maximum conceptions were noted in the period up to 6 months following the reconstruction surgery.

#### **DISCUSSION:**

In a study by Rajendran MK the cumulative pregnancy rate was >90% where as in a study by Fakhrolmolouk Yassaee M.D, it was only 26.6% <sup>4.5</sup>. The overall success in terms of intrauterine pregnancy after reversal by microsurgery has been reported by other authors as 50-70%<sup>6</sup>. In the current study, we had a conception rate of 61.29% with live birth rate of 73.78%, 3 patients had spontaneous abortion and 2 patients had ectopic pregnancies which required emergency intervention. Our study is comparable with a study done by Shilpa MN et al, where the pregnancy rate was reported to be 55.5% with a live birth rate of  $72\%^7$ .

Increasing age of the patient highly affected the fertility of the patient. In the present study the pregnancy rates were higher in patients within age group of 20-24 (100%) and 25-29 (75%) years. This was comparable with a study done by Sowmya Koteshwar et al and Madhu Jain et al<sup>8,9</sup>. Similarly in our study conception rate was higher in patients with parity1 and parity 2, probably because they belonged to younger population.

Those patients who requested recanalisation within 1 year of sterilisation, all the patients conceived followed by patients with 1-5 years of sterilisation reversal interval (77%). The pregnancy rate substantially declined with interval exceeding 5 years(11.11%). Madhu Jain et al, in their study achieved a conception rate of 77% with sterilisation reversal interval of <2 years, similarly Shilpa MN et al had a pregnancy rate of 75% with sterilisation reversal interval of <2 years<sup>7.9</sup>. In the present study death of the children was the commonest reason for the couple to seek reversal of sterilisation(70.96%), where as in the study by katz et al death of a male child(64.2%) was the main reason for sterilisation reversal surgery<sup>10</sup>.

Koteshwar et al, reported 100% conception rate in reversal surgeries following Laparoscopic tubal ligation where as 68.57% pregnancy rates were observed in reversal surgery following laproscopic tubal sterilisation in a study done by Jain et al<sup>89</sup>. We achieved a significantly comparable rate of 90% in our study, this is because Laproscopic sterilisation results in minimal injury to the tube and hence the chances of fertility are better.

The other factors which affected the results were type of anastomosis and length of the tube achieved. Some studies suggested isthmo-isthemic anastomosis is associated with higher success of reversal surgery. In the current study also 6 patients had isthmo-isthemic anastomosis and all patients conceived. 100% success rate with isthmo-isthemic anastomosis was also seen in a study done by Koteshwar et  $al^8$ .

The present study suggests that the chances of conception after reconstruction is more if the total length of the tube is more than 6 cm (83.33%), this is similar to the finding of the study regarding relationship between the length of the oviduct and the occurrence of the pregnancy by V. Gomel<sup>11</sup>, a study done by Rouzi A et al<sup>12</sup> and another study by Premalatha et al<sup>13</sup>. In our study all the 3 patients (37.5%) who conceived after achieving tubal length of <4 cm had bad pregnancy outcome with 2 patients having ectopic and 1 patient with spontaneous abortion.

The minimum interval after which pregnancy was reported after the reversal surgery was 4 months in our study where as it was 9 months in a study done by Ramalingappa et al<sup>14</sup>. The mean conception interval period in the same study was 42.09 months where as more patients conceived within 6 months of sterilisation reversal surgery in our study.

## CONCLUSION:

The demand for tubal ligation reversal surgery has increased over the period of time with increasing tubal sterilisation surgeries. Tubal microsurgery by laprotomy has resulted in promising pregnancy rates and can definitely be used in patients who cannot afford laprocopic/robotic reversal surgeries or IVF. However the success of the reversal surgery largely depends upon the precise technique of tubal sterilisation surgery used previously. Tubal sterilisation surgeries should ideally be performed according to the standard guidelines so that if reversal surgery is required the success will be better. Isthmic portion of the tube should be blocked and the loop should be less than 1.5 cm in length. These easy steps will contribute appreciably to the success of tubal sterilisation reversal surgeries and bring back fertility in women who desire to change their decision due to some life circumstances.

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