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**Original Research Article**

# Outcome of recanalization and factors affecting it: a retrospective study at tertiary care center

**Niyati Jain Shah*, Ritu Sharda, Neha Agarwal, Shraddha Daksha**

Department of Obstetrics and Gynecology, Amaltas Institute of Medical Science, Dewas, Madhya Pradesh, India

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***Correspondence:**
Dr. Niyati Jain Shah,
E-mail: destiny.nature@gmail.com



## ABSTRACT

**Background:** In spite of availability of multiple methods of contraception, tubectomy remains most popular method of contraception in India, especially in rural population. For restoration of fertility, maximum patients prefer tubal recanalization over in vitro fertilization. Primary objective of our study was to evaluate pregnancy rate after recanalization surgery and to analyze factors affecting it.
**Methods:** A retrospective observational study conducted in the Department of Obstetrics and Gynecology at Amaltas Institute of Medical Science, Dewas from April 2021 to April 2023 with a one year follow up.
**Results:** Total 14 Patients of sterilization reversal were considered for the study. Commonest cause for reversal in our study was second marriage (57.14%). Pregnancy rate in our study was 57.14%; all were intra uterine pregnancies. Majority of the patients who got conceived belonged to the age group of 26-30 years. Patients with history of laparoscopic tubectomy had 87.5% conception rate as compared to 16% with history of open tubectomy. Maximum number of patients who conceived had interval of 3-6 years between sterilization and reversal (63.6%). Conception rate was 70% with final tubal length being more than 4 cm and 85% with isthmo-isthemic anastomosis.
**Conclusions:** Patients who want tubal sterilization should be counselled about alternative spacing methods of contraception. Tubectomy should be done at isthmus through laparoscopic method as it causes minimum damage to tube. Final tubal length (>4 cm) and site of anastomosis (lsthmo-isthemic) are important factors for success of a recanalization surgery.

**Keywords:** Contraception, Isthmo-isthemic anastomosis, Laparoscopic sterilization, Recanalization, Tubal length

## INTRODUCTION

Multiple methods of contraception are available but tubectomy still remains one of the most popular methods in India especially in rural population, as it is a onetime permanent solution and covered under government program. Even young women in their twenties opt for it.[1,2] About 10% of them later regret their decision and about 1% want to restore their fertility. Main reasons being loss of male child or remarriage.[3] The options left with these women are in vitro fertilization (IVF) or tubal recanalization. Most of the women prefer recanalization as it is less expensive and a being a onetime procedure patients can attempt conception every month without further intervention.[4] Primary objective of our study was to evaluate pregnancy rate after surgery and to analyse factors affecting it.

## METHODS

It is a retrospective observational study conducted at Amaltas Institute of Medical Sciences, Dewas from April 2021 to April 2023 with a 1 year follow up. A total of 14 recanalization patients were included.

***Inclusion criteria***

Patients with age <40 years, normal semen parameter of husband, no cornual block in pre-operative Hysterosalpingography (HSG) were included.

***Exclusion criteria***

Lost to follow up cases, any contraindication of surgery or pregnancy, any other cause of infertility like fibroid, endometriosis, PID etc were excluded.

***Surgical procedure***

All the cases were done through laparotomy incision under spinal anaesthesia to prevent formation of adhesions. Same surgical steps were followed in all cases, with the principles of microsurgery. Powderless gloves and continuous irrigation with heparinized Ringer lactate were used.

The fibrosed ends of medial and lateral segment of tubes were excised through micro scissor. Proline 1-0 suture was used as a stent. Patency was checked by methylene blue dye. For anastomosis 6-0 vicryl was used for muscularis. First stitch was taken at 6 o'clock position with knot facing serosa, similar sutures were taken at 3, 9, and 12 o'clock positions. Mucosa was avoided, serosa was approximated similarly. Mesosalpinx was sutured with vicryl 4-0 suture. Proper haemostasis was achieved in every case with bipolar cautery. Patency was checked after anastomosis and no additional sutures were required in any case. Site of anastomosis and final length of tubes were noted.

Average duration of surgery was 60 mins. Blood loss was minimal. No immediate post op complication was noted. To reduce inflammation patients were given antihistaminic (promethazine 25m, intra muscular 12 hourly) and steroid (dexamethasone 8 mg, intra venous 12 hourly) for 3 days.

Patients were asked to start trying for pregnancy after 2 menstrual cycles. All the patients were followed up for 1 year.

***Statistical analysis***

Descriptive statistics (frequency %) were used to depict the distribution of age category, technique, final length of the reconstructed tube, and site of anastomosis, etc. Fisher's exact test was used to identify associations between categorical variables. A p-value of less than 0.05 was be considered statistically significant. The analysis was conducted using SPSS version 22.

## RESULTS

Total 14 patients of sterilization reversal were taken for the study with a 1 year follow up. Commonest reason for seeking reversal of sterilization in our study was second marriage (57.14%).

**Table 1: Age of patients.**

| Age (years) | Total no. of patients | Conceived | Not Conceived | Percent | P value |
|---|---|---|---|---|---|
| **20-25** | 4 | 3 | 1 | 75 | 0.50 |
| **26-30** | 6 | 4 | 2 | 66.6 | |
| **31-35** | 4 | 1 | 3 | 25 | |
| **36-40** | 0 | 0 | 0 | 0 | |

**Table 2: Interval between sterilization and reversal.**

| Years | Total no. of patients | Conceived | Not conceived | Percent | P value |
|---|---|---|---|---|---|
| **0-3** | 0 | 0 | 0 | 0 | 0.58 |
| **3-6** | 11 | 7 | 4 | 63.6 | |
| **6-9** | 3 | 1 | 2 | 33.3 | |
| **>9** | 0 | 0 | 0 | 0 | |

Total 8 patients got conceived giving a pregnancy rate of 57.14%, all were intrauterine pregnancies. No ectopic pregnancy was recorded.

Among the patients who conceived, majority were of age group 26-30 years. Conception rate was highest between 20-25 years (75%) (Table 1).

Maximum number of patients who conceived had an interval of 3-6 years between sterilization and reversal (63.6%) (Table 2).

Percentage of patients who conceived with history of laparoscopic tubectomy was 87.5% as compared to 16% with the history of open tubectomy (Table 3).

Conception rate in our study was 70% with final tube length >4 cm as against only 25% with length <4 cm (Table 4).

Conception rate with isthmo–isthmic anastomosis was 85% as compared to 50% with isthmo-ampullary anastomosis (Table 5).

**Table 3: Sterilization technique.**

| Technique | Total no. of patients | Conceived | Not conceived | Percent | P value |
|---|---|---|---|---|---|
| **Laparoscopic tubectomy** | 8 | 7 | 1 | 87.5 | 0.026 |
| **Open tubectomy** | 6 | 1 | 5 | 16.7 | |

**Table 4: Final length of reconstructed tube.**

| Final length of reconstructed tube | Total no. of patients | Conceived | Not conceived | Percent | P value |
|---|---|---|---|---|---|
| **> 4cm** | 10 | 7 | 3 | 70 | 0.24 |
| **< 4cm** | 4 | 1 | 3 | 25 | |

**Table 5: Site of anastomosis.**

| Anastomosis | Total no. of patients | Conceived | Not conceived | Percent | P value |
|---|---|---|---|---|---|
| **Isthmo-isthmic** | 7 | 6 | 1 | 85 | 0.04 |
| **Ampullo-ampullary** | 3 | 0 | 3 | 0 | |
| **Isthmo-ampullary** | 4 | 2 | 2 | 50 | |

No patient conceived in our study with ampullo–ampullary anastomosis.

## DISCUSSION

In present study, overall conception rate was 57.14% (8 patients out of 14 patients). All were intrauterine pregnancies. No ectopic pregnancy was recorded. Our study correlated with a study by Sowmya et al where conception rate was 50% with no ectopic pregnancy. Another study done by Shilpa et al, Sangoli et al and Jayakrishnan et al had overall pregnancy rate of 55.5%, 52.5% and 58.5% respectively.[5-7]

In our study higher rate of conception after tubal recanalization was seen in women aged less than 30 years i.e. 75% in 20-25 years of age group and 66.6% in 25-30 years of age group. Sowmya et al showed 100% pregnancy rate in patients below 30 years. Similarly, Jain et al showed 75% pregnancy rate in age group less than 25 years. Sangolli et al in their study achieved higher pregnancy rate in age group less than 30 years. Rate of conception decreased with increasing age, as other factors for infertility also increase with age.[6,8,9]

Present study showed that the rate of pregnancy was higher (87.5%) in women who had undergone laparoscopic sterilization compared to just 16% in women who had undergone open modified Pomeroy's method of sterilization. Similarly, Sangolli et al and Kalaichelvi et al reported higher success rate 62% and 68% in patients who had undergone laparoscopic sterilization respectively. All other studies reported that patients with previous history of laparoscopic sterilization had better outcome of reversal because it causes less damage to tubal length.[6,10]

In our study, higher pregnancy rate was seen when interval between sterilization and recanalization was between 3-6 years. No conception was seen before 3 years and after 9 years of interval. Sangoli et al reported 57.1% of pregnancy rate when the interval between sterilization and reversal was less than 4 years.[6] While Shilpa et al showed 75% pregnancy rate when reversal was done within 2 years. With increasing interval, the age of patient also increases which further contributes to infertility.[5]

Length of reconstructed tube is one of the important factors affecting pregnancy outcome. In present study, 7 out of 10 patients (70%) conceived with >4 cm length of reconstructed tube, while only 1 out of 4 patients (25%) conceived with final tubal length of <4 cm. Yassaee et al reported that tubal length >4 cm had better pregnancy outcome. Similarly, Shilpa et al showed higher pregnancy rate 82.2% in women who had final tubal length of >6 cm and 12.5% when it was <5 cm. PJ Paterson et el reported poor pregnancy rate with final tubal length <4 cm.[5,11,12]

Rate of conception also depends on the site of anastomosis; tubal ends should be equal at the site of anastomosis for better outcome. In our study, isthamo-isthamic anastomosis had 85% conception rate while isthamo-ampullary had only 50%. Other studies like Sangoli et al and Shilpa et al show higher success rate with isthamo-isthamic anastomosis.[5,6]

As with the majority of studies, the current study is subject to limitations. These include its small sample size,

retrospective design and a single-centre setting. These limitations may affect the generalizability of the findings and the ability to draw definitive conclusions regarding the effectiveness and implications of tubal recanalization. Additionally, the study's focus on a specific population may limit the applicability of its results to other groups with different demographic characteristics or cultural factors. Further research with a larger sample size, prospective design, and a multicentric setting is needed to address these limitations and provide a more comprehensive understanding of tubal recanalization.

## CONCLUSION

Every patient who comes for tubal sterilization should be thoroughly counselled about availability of alternative spacing methods of contraception, especially young patients. Every patient undergoing sterilization should be considered as a potential candidate for reversal. So laparoscopic tubal sterilization should be preferred over open technique, as it causes minimum damage to tube and maximum tubal length can be obtained after reversal which is an important factor for the success of reversal surgery (p value = 0.026). Tubectomy should be done preferably at isthmus, as isthmo-isthmic anastomosis has better outcome. Open method of recanalization, while following principles of microsurgery and good post operative anti-inflammatory cover, has a good pregnancy outcome and it can be considered as treatment of choice in a resource poor setting.

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