

## A Study on Tubal Recanalization

Ramalingappa A. · Yashoda

Received: 23 May 2009 / Accepted: 9 March 2012 / Published online: 8 June 2012  
© Federation of Obstetric & Gynecological Societies of India 2012

### Abstract

**Objectives** To study the various factors affecting the success rate of tubal recanalization and the reasons for failure of the procedure.

**Methods** A retrospective study was conducted during 2000–2007 @ KIMS, Hubli.

**Results** Of the 25 subjects who underwent tubal recanalization, 44 % of women conceived and they were >35 years of age. Laparoscopically sterilized patients had better chances of conception (50 %) following reversal than those who were sterilized by Pomeroy's method (30 %). With post-reversal tubal length of >4 cm, pregnancy rate was 50 %. Isthmus–Isthmus and Isthmus–Ampullary anastomosis have 50 % success rates.

**Conclusion** Tubal recanalization by microsurgical technique is one of the methods to solve infertility after sterilization.

**Keywords** Sterilization · Tubal recanalization · Microsurgical technique

### Introduction

Man and his selfish deeds have led to an increase in the natural calamities, accidents, etc. which take the lives of innocent children, and parents are left alone to cry over the loss of never-to-be-born child, especially those who have already had undergone sterilization. There are various techniques of making them fertile again, one of which is tubal recanalization where in the cut-ends of the tubes are anastomosed by microsurgical technique, other factors being normal. The outcome is affected by the age of the patient, length of the remaining tube for recanalization, method of previous sterilization, the duration between sterilization and recanalization, and site of ligation [1].

### Objectives

1. To study the various factors affecting the success rate of tubal recanalization.
2. To study the reasons for failure of the procedure.

### Materials and Methods

In this study, 25 women have undergone tubal recanalization during the period 2000–2007 in Karnataka Institute of Medical Sciences, Hubli. The surgeries were performed by the author.

Ramalingappa A. (✉), Professor · Yashoda, Assoc. Professor  
Department of OBS. & GYN., Karnataka Institute of Medical  
Sciences, Hubli, Karnataka, India  
e-mail: dryashoda@gmail.com

**Procedure**

**Preoperatively**

Women were selected as per the standard guidelines set by the Ministry of Health and Family Welfare. The couples were counseled about the surgery and the success rate. They were subjected to investigations which included diagnostic laparoscopy. The male partner was tested for fertility.

**Intraoperatively**

Initially, loupe had been used for magnification; however, for the last 2 years, microscope has been used. Adhesions if present were removed electrosurgically.

Bipolar cautery was used. Continuous irrigation with heparinized ringer lactate solution was used to prevent formation of adhesions. The cut-ends of occluded tube were identified. The fibrosed end of medial and lateral segments of the tube were excised. Patency checked for by injecting methylene blue dye. No stent was used during the procedure. Mesosalpinx was sutured with prolene no. 6-0. Anastomosis was done by means of 8-0 prolene suture material for muscularis. First bite was taken at 6 O'clock position, i.e., mesentric border and later at 3, 9, and 12 O'clock positions. Serosa was approximated similarly. Patency checked after anastomosis. For fimbriectomy cases, cuff salpingostomy was done.

**Results**

The results of this procedure were evaluated with respect to age, type of sterilization done previously, interval between

sterilization and recanalization, length of the tube postoperatively, and condition of the fimbriae.

The reasons for failure of the procedure are also discussed.

With respect to all the factors, the results are categorized into three groups:

- Group (A): Conceived—the patients who have conceived irrespective of the outcome.
- Group (B): Follow up Period—those who have undergone recanalization within the previous 1 year and have not yet conceived.
- Group (C): Not Conceived—those who have not conceived even after 1 year of recanalization.

	No. of cases	% of cases
Conceived (A)	11	44
Follow up period (B)	7	28
Not conceived (C)	7	28

The chances of conception decrease with age and are nil after 35 years (Chart 1).

**Conclusions of Studying the Duration Between Sterilization and Recanalization**

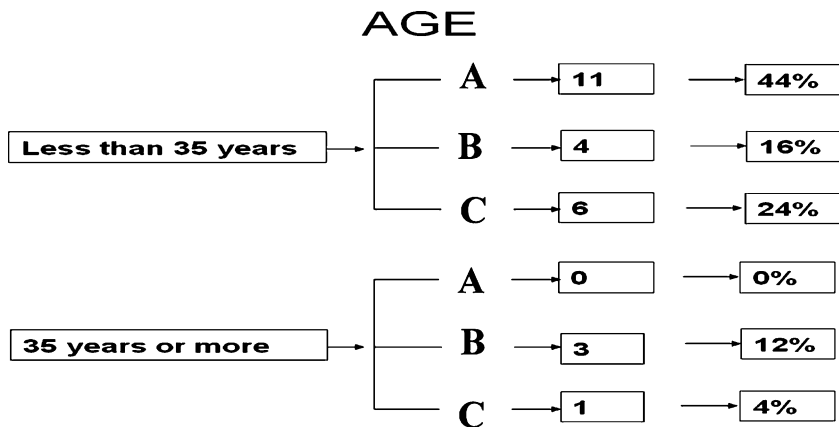
Range: 4–156 months.

Mean interval 63.04 months.

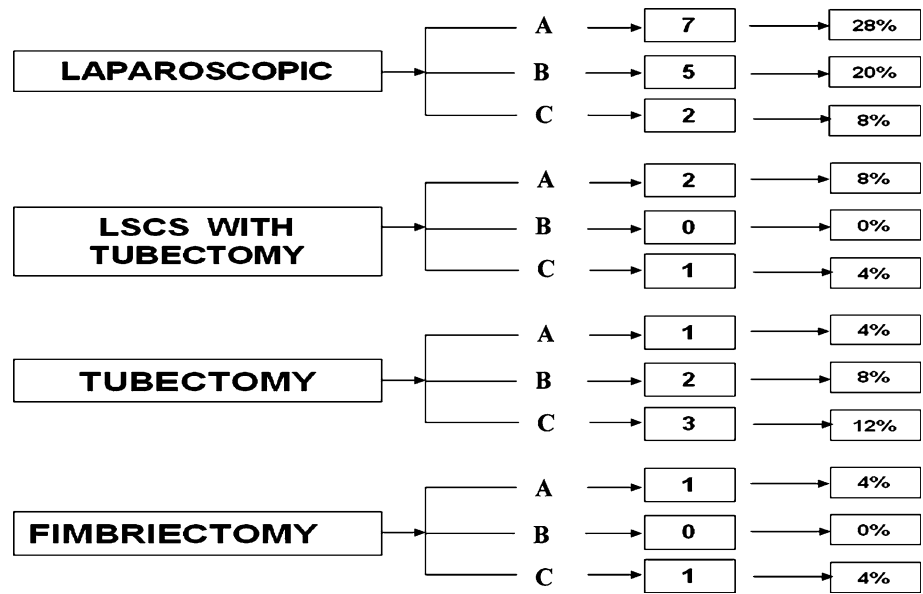
Least interval with which conception has occurred is 9 months.

The maximum interval with which conception has occurred is 72 months.

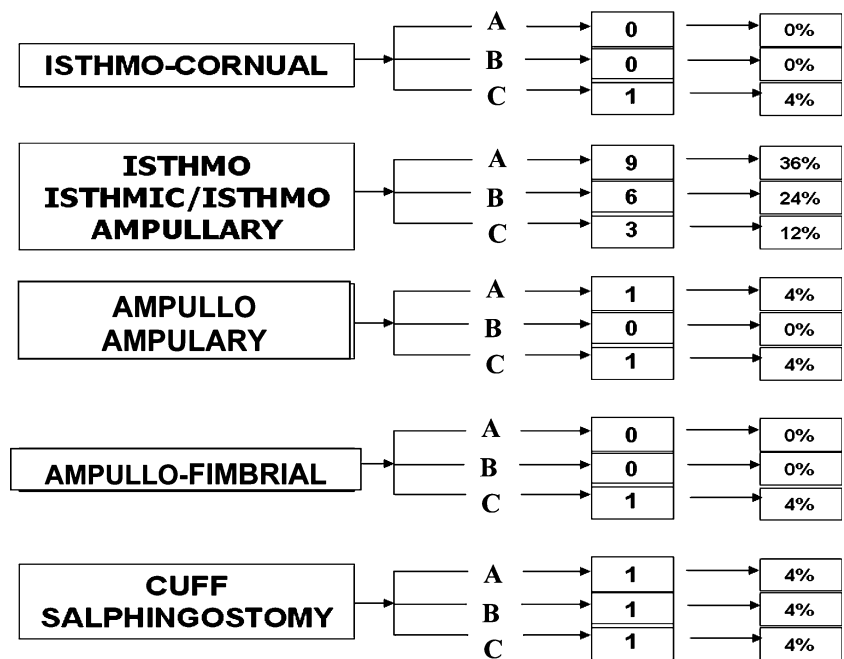
**Chart 1** Age



**Chart 2** Types of sterilization procedure



**Chart 3** Postoperative tubal length, types of anastomosis, and adhesions



The mean conception interval period is 42.09 months. Following laparoscopic sterilization, the chances of conception are maximum (Chart 2).

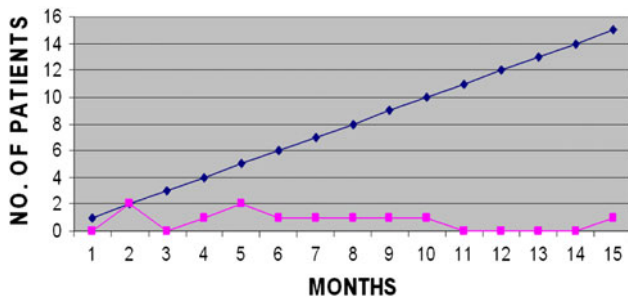
The minimal post recanalization tubal length is to be 4 cm. Following isthmo-isthmic type of anastomosis, the conception rate is high. The presence of adhesions increases the failure rate (Chart 3).

The minimum interval is within 2 months.

The maximal interval is 15 months (Graph 1).

**Follow up After Conception**

LSCS with tubectomy	6
LSCS	1
Home deliveries	1
Pregnant	1
Ectopic pregnancy	1
Abortion	1
Total	11



**Graph 1** Interval between recanalization and conception

### Reasons for Failure of Seven Cases are

- CASE 1. Husband expired after 15 days of recanalization.  
 CASE 2. No follow up of the patient.  
 CASE 3. Previous 2 LSCS—on one side, it was Isthmo-fimbrial, and only 30 % of the tube was retained. On the other side, it was ampullo-ampullary. On both sides, dense adhesions were present.  
 CASE 4. Age—38 years. Bilateral isthmo-cornual recanalization with dense adhesions.  
 CASE 5. Bilateral Ampullo-fimbrial type of recanalization, less than 40 % of the tube was remaining. Dense adhesions on both sides.  
 CASE 6. Age—34 years. Cuff salpingostomy was done on both sides. Dense adhesions were present.  
 CASE 7. Age—32 years. Bilateral isthmo-isthmic type of recanalization with dense adhesions.

### Conclusion

Tubal recanalization is a microsurgical technique which needs significant training and expertization in handling the tissues meticulously. The success depends on patience, perseverance, and perspiration on the part of the surgeon. In recent years, increasing number of couples of lower age and lower parity have begun to request for sterilization. When these couples experience the death of a child or if they divorce or remarry following death of husband, they may wish to be able to have another child. The availability of microsurgical recanalization procedures would bring hope to those in need of these services and would improve the confidence of clients who are acceptors of voluntary sterilization.

In our study there were various factors which affected the success of recanalization procedure like age of the patient, method of previous sterilization, duration between sterilization and recanalization procedure, site of anastomosis, the presence of adhesions, and post-operative tubal length. We found that the chances of conception reduce

significantly as the age of the patient increases. None of the patients conceived after 35 years of age. In a study by Jain et al., pregnancy rate was higher (75 %) when the age of the patient was 25 years or less [1]. The rate of ectopic pregnancy increases after sterilization reversal procedure. In our study, one pregnancy out of eleven resulted in ectopic. It is worth remembering that sterilization itself predisposes to ectopic pregnancy in case of failure of sterilization up to 7–16 % [2, 3].

Among various factors that affect the success, the length of the tube after recanalization is the most important one. In our study, when the post reversal tube length was >4 cm, the pregnancy rate was 50 % but nil when the post recanalization tubal length was <4 cm. Similar results have been reported by Jain et al. The pregnancy rate being 83.33 % with 8–10 cm post surgical tube and 9.09 % with <4 cm tube remaining after surgery [1]. In 1980, Sherman, Siber, and Robert reported 100 % pregnancy rate with >4 cm of tube, and 0 % with <3 cm tubal length after reversal by micro-surgical technique [4]. Gomel, in his study, mentioned that the length of the tube was not only important for success of the operation but it also affected the time interval between the procedure and the pregnancy. Those who had <4-cm length of repaired tube took significantly longer time to conceive—19.1 months when compared to 10.2 months in women with tubal length >4 cm [5].

Some important studies have suggested that isthmus-to-isthmus anastomosis has the best chances of conception [4, 6]. This is also proved in our study. Our results showed that isthmus-to-isthmus anastomosis and isthmus-to-ampullary anastomosis resulted in 50 % pregnancy rate. In a study by Jain et al. isthmus-to-isthmus anastomosis resulted in pregnancies in 83.33 %, and ampullary-to-ampullary anastomosis in 42.85 %, and isthmus-to-ampullary anastomosis resulted in 20 % pregnancy rate [1].

The two most widely used methods of sterilization in our country are laparoscopic sterilization where Falope ring is used, and the other is Pomeroy's method. In our study, laparoscopically sterilized patients had better chances of conception (50 %) following reversal than patients who were sterilized by Pomeroy's method (30 %). Similarly, in a study by Jain et al., patients with Falope ring showed comparatively better results (68.57 %) than Pomeroy's (40 %). Laparoscopic sterilization results in minimal injury to the tube and hence the chances of conception are better.

Hence, during sterilization, a surgeon should always keep the following in mind:

- Site of occlusion—isthmus.
- Loop should be of less than 1.5 cm in length.
- Laparoscopic sterilization is preferred.

Precautions to be taken to prevent adhesions.

Recently, tubal sterilization reversal has been done by laparoscopic procedure using titanium staples [7], with one-suture technique [8], on outpatient basis. Though laparoscopic recanalization of the tubes provide few advantages over laparotomy yet they are still in the preliminary phase and not time tested.

## References

1. Jain M, Jain P, Garg R, et al. Microsurgical tubal recanalization: a hope for hopeless. *Indian J Plast Surg.* 2003;36:66–70.
2. CHI I-C, Gardner SD, Laufe LE. The history of pregnancies that occur following female sterilization. *Int J Gynecol Obstet.* 1979;17:265–7.
3. Tatum HJ, Schimdt FH. Contraceptive and sterilization practices and extrauterine pregnancy: a realistic perspective. *Fertil Steril.* 1977;28:407–21.
4. Silber SJ, Cohen RS. Microsurgical reversal of female sterilization: the role of tubal length. *Fertil Steril.* 1980;33:598–601.
5. Gomel V. Microsurgical reversal of female sterilization: a reappraisal. *Fertil Steril.* 1980;33:587–97.
6. Microsurgery in gynecology. In: Phillips JM, editor. *Proceedings of the workshop for laparoscopy and microsurgical repair of the fallopian tube and the 1st international congress of gynecologic microsurgery.* Irvine: University of California; 1977. p. 264.
7. Laurel S, Sauer MV. Outpatient laparoscopic surgery to reverse tubal sterilization using titanium staples: preliminary experience. *Hum Reprod.* 1997;12:647–9.
8. Francois B, Louise L, Renda B. Outpatient laparoscopic tubal anastomosis and subsequent fertility. *Fertil Steril.* 1999;72:549–52.