

Pregnancy after Tubal Sterilization

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How to cite this article:

P Akshara, Vattikuti Sonica, Y Annapoorna/Pregnancy after Tubal Sterilization/Indian J Obstet Gynecol. 2021;9(4):213-218.

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Abstract

Objectives: In our study, we have tried to evaluate the causative factors for sterilization failure and also to discuss preventive measures to avoid maternal morbidities and unwanted pregnancies and as a result of sterilization failure especially in developing countries like India and tried to establish methods to decrease the rates of failed sterilization.

Materials and Methods: This study is a retrospective study that was done on all the women presented with failed sterilization in the Department of obstetrics and gynaecology, GSL medical college and general hospital from May 2018 to May 2019.

Results: During 1 year 20 cases of post-sterilization failure were reported, out of which 16 (80%) cases were intra-uterine pregnancies and 4 (20%) were ectopic pregnancies. Among which 17 (85%) cases underwent sterilization by modified Pomeroy's method & 3 (15%) underwent laparoscopic sterilization.¹⁴ (70%) cases presented to opd within 12 wks of gestation, out of which 2 cases (10%) underwent first trimester MTP.¹⁰ (50%) cases delivered at term by normal vaginal delivery, 1 case delivered as preterm & 4 (20%) delivered at term by elective cesarean section. 7 cases underwent re-sterilisation by fimbriectomy & 13 cases underwent sterilization by bilateral salpingectomy.

Conclusion: In the present study open method of sterilization was the most common cause of post sterilization failure than laparoscopic sterilization. Conversely, sterilization failure after one year is more likely due to natural tubal lumen regeneration

through tubal recanalization or fistula formation. Hence proper counselling before sterilization should be done regarding the procedure, failure rates and morbidity. Surgical procedures should document Intra-operative adhesions, difficulty in identifying tubes, slipped rings or bands. Despite few failure rates tubal sterilization remains the most chosen method to control the population.

Keywords: Ectopic pregnancy; Female sterilization; Fimbriectomy; Post sterilization failure; Resterilization; Tubal ligation.

Introduction

The most accepted family planning in India is tubal ligation of the female which accounts for 65% of contraceptive use which is the highest all over the world. It has a very low failure rate of 0.1-0.8% in the first year and overall pregnancy chances of 1 in 200.¹ However, in some women; sterilization failure may occur at rates as low as 0.1-0.3%.² Post sterilization failure commonly presents as ectopic gestation and it accounts for approximately 12% of all ectopic cases.³ There is a high association between ectopic pregnancy and conditions that are thought to hamper the migration of the fertilized ovum to the uterus. These include fallopian tube damage from prior pelvic inflammatory disease, history of ectopic pregnancy, and previous tubal surgery, including tubal ligation. The most commonly used method in female sterilization in India is the laparoscopic

tubal occlusion. Over 85.3% of all the women who have adopted laparoscopic tubal occlusion as a method of contraception availed from government facilities.⁴ In this study, we have tried to evaluate the causative factors for sterilization failure and also to discuss preventive measures to avoid maternal morbidities and unwanted pregnancies as a result of sterilization failure specifically in developing countries like India.

Sterilization failure depends on various factors like woman characteristics, operator experience, method of sterilization, and technique of sterilization used. Elective sterilization rates have increased in the past few years but failures are rare with an incidence of 0.13-1.3%.⁵ Although the elective sterilization rate increased tubal recanalization rate also increased due to factors death of a second child, death of a male child, second marriage, tubal ligation done without counselling.⁶ The United States National Survey of Family Growth estimates that approximately 1 million women undergo elective tubal sterilization procedures annually and that 1% of these women will later request its reversal. In a prospective study that surveyed women up to 7% regretted the decision of tubal ligation.⁷

Factors Contributing to Failure of Sterilization

Timing: sterilization can be performed in the postpartum period or post-abortion. But the incidence is more in open cases like postpartum or during cesarean may be due to changes in anatomy during pregnancy which makes the tube edematous, friable, and congested leading to incomplete tubal occlusion. As a result of this, slit-like spaces and blind pouches are formed which may lead to ectopic implantation.⁸ Probable fluid movements within the remaining tubal segments would also favour implantation in the tube.⁹ The ectopic pregnancy rates in the US Collaborative Review of Female Sterilisation Failure Working Group (CREST) study were 33%.¹⁰

Pregnant at the Time of Sterilization: studies have identified luteal pregnancy in 0.32-0.6%. routine pre-operative same-day pregnancy testing should be done to reduce luteal phase pregnancy.

Method Failure: Bipolar method compared with the unipolar method increased the risk of pregnancy failure and ectopic pregnancy.

Factors Dependent on Operator Error

Fault in Localising the Correct Sterilization Site: This

involves anatomical misplacement of sterilization device away from the optimal mid isthmic tubal site (1-3 cms from uterine cornu) or mistaken sterilization of adjacent structure(round ligament or fold of peritoneum between the round ligament and tube).

Deviation from the Recommended Technique for Each Sterilisation Method: The filshie clip should be applied in a manner to completely encapsulate lumen, be locked with upper jaw compressed, completely flattened & its end adequately secured under the latch which locks the clip jaw.

Failure in the Systematic Approach to Check the Sterilization Method: Upon completing the sterilization procedure, it is imperative that the operator check the tubal fimbriae and followed them back to the tubal isthmus.

Complete or Partial Transaction of Tube: Improper use of clip or diathermy may lead to the tubal transaction (partial or complete) & subsequent sterilization failure through luminal regeneration.

Factors Independent of Operator Error

Spontaneous Tubal Regeneration: Occurs through two mechanisms. (a) tube-peritoneal fistula formation (b) spontaneous tubal reapproximation associated with tubal reanastomosis and recanalization.

Mechanical Failure of Occlusion Device

Indirect Factors Predisposing to Sterilisation Failure: Tubal Patency Occuring Despite Correctly Applied Sterilization Technique: There are three mechanisms (a) a partially non-occluded segment of the tubal lumen has formed within the clip. (b) incomplete tubal lumen occlusion by electrocautery desiccation. (c) pre-existing utero-tubal structural abnormalities such as accessory fallopian tube & uterine didelphys.

Women's Age and Interval From the Procedure: Greater the time elapsed between surgery & the younger the age the sterilization was performed, the higher the cumulative pregnancy failure rate will be. Most pregnancies after failed sterilization tend to occur within one to two years.

Pre-Existing Gynaecological Pathology: Pre-existing tubal disease, history of abdominal or pelvic surgery, pelvic inflammatory disease, obesity, previous induced abortion, prior usage of the intrauterine contraceptive device, fibroids, endometriosis & congenital uterine malformations.

Materials and Methods

This study is a retrospective study done in all 20 women presented with failed sterilization in the Department of obstetrics and gynaecology, GSL medical college, and general hospital during the period of May 2018 to May 2019. Information has been collected from case records of these patients maintained in the institution after approval by the ethics committee. The information of each patient was obtained from their case records kept in the medical records department. The informed consent form was not needed as the identity of the patient has not been revealed anywhere. The study was done by taking demographic data regarding age, parity, gestational age, the timing of sterilization, fate of pregnancy, mode of delivery, the interval between sterilization and pregnancy, intraoperative findings, and resterilization procedure. All the information is entered in a pre-structured proforma. All the data were analyzed by the percentage method.

Results

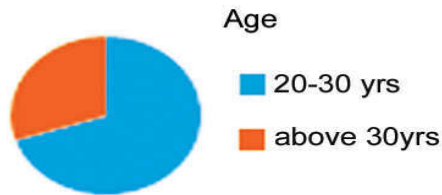


Fig. 1: Most of the women conceived are between 20-30 yrs (70%) and 30% are above 30 yrs.

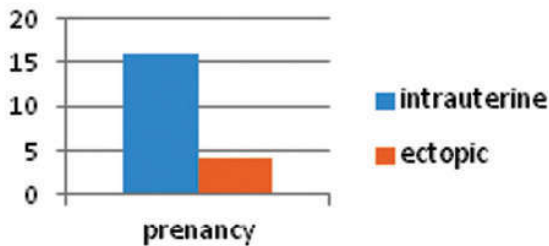


Fig. 2: During one 1 year 20 cases of post-sterilization failure were reported, out of which 16 (80%) cases were intra-uterine pregnancies and 4 (20%) were ectopic pregnancies.

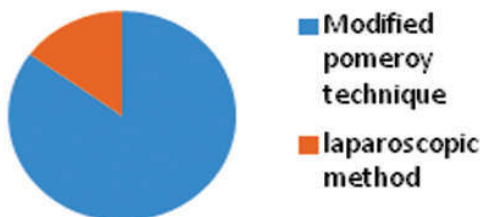


Fig. 3: out of which 17 (85%) cases underwent sterilization by modified Pomeroy’s method & 3 (15%) underwent laparoscopic sterilization.

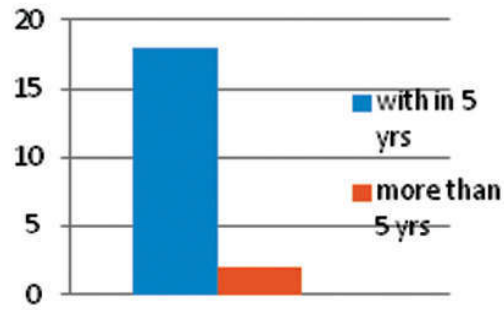


Fig. 4: 18(90%) cases were conceived within 5yrs of pregnancy and 2(10%) cases were conceived after 5yrs.



Fig. 5: 14 (70%) cases presented to opd within 12wks of gestation, out of which 2 cases (10%) underwent first trimester MTP. 10 (50%)cases delivered at term by normal vaginal delivery, 1case delivered as preterm & 4 (20%) delivered at term by elective cesarean section.



Fig. 6: 7 cases underwent sterilization by fimbriectomy & 13 cases underwent sterilization by bilateral salpingectomy.



Fig. 7: Case 1: (A) Left tube recanalized

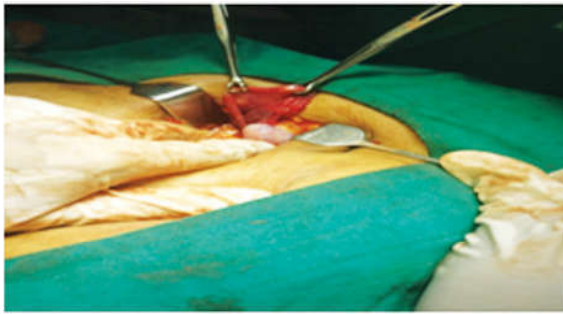


Fig. 7: Case 1: (B) Right tube recanalized.



Fig. 8: Case 2: (A) Right tube showing tubectomy



Fig. 8: Case 2: (B) Left tube showing recanalization.

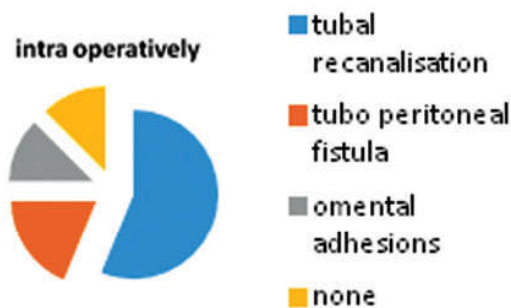


Fig. 9: 18(90%) cases were conceived within 5yrs of sterilization. There is evidence of intraoperative sterilization noted in all the cases. Intraoperatively tubal recanalization is seen in 9(45%) cases, tuboperitoneal fistula is seen in 3(15%) cases & omental adhesions are seen in 3(15%) cases.

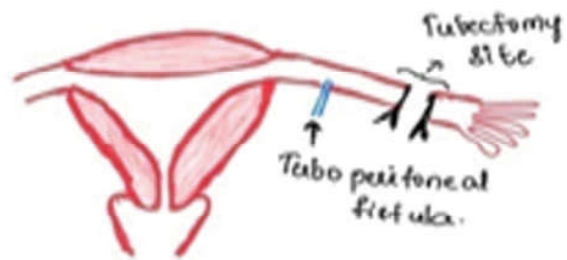


Fig. 10: Diagrammatic Representation Tuboperitoneal Fistula.

Table 1: Table Depicting the Demographic Details.

Parameters	
Intra OP Findings	-
Recanalization	10(50%)
Tubo peritoneal fistula	04(20%)
Omental adhesions	03(15%)
None	03(15%)
Mode of Delivery	
MTP	02(10%)
NVD	10(50%)
LSCS	04(20%)
Resterilization	
Fimbriectomy	07(35%)
B/L Salpingectomy	13(65%)

Table 2: Table Showing Causes of Tubal Sterilization, Mode of Delivery at Term and Method of Resterilization.

Parameters	ECTOPIC	Intrauterine Pregnancy	Total
Age			
20-30 Yrs	2	12	70% (14)
Above 30 Yrs	2	4	30% (6)
Parity			
3	3	9	60%(12)
4 & Above	1	7	40%(08)
Gestational age			
1st trimester	4	10	70%(14)
2nd trimester	-	6	30%(06)
Methods			
Pomeroy	3	14	85%(17)
laparoscopy	1	2	15%(03)
Time Interval			
Less than 5	4	14	90%(18)
More than 5	-	2	10%(2)

Discussion

In our study chances of failure are seen mostly among young women which are about 70%. This is similar to the study done by shilpavishwaset al.⁴

The prevalence of young women is more in our part of the country due to early marriages and early conceptions.

In our study failure with mini-laparotomy (85%) was more compared to laparoscopic sterilization which is similar to the study by Rathod, Sethu et al.¹ and contrary to Kulier et al.¹¹ Mini laparotomy is most commonly done on our part as most of the patients belong to low socioeconomic status and puerperal sterilization and deny general anaesthesia.

In our study, 85% of the failure was seen in women who had the Modified Pomeroy technique. The prevalence of the Modified Pomeroy technique is more as it is the most commonly done method in mini-laparotomy. But Rathod S et al showed 66% of failure after the Modified Pomeroy technique.¹

Out of the cases presented with failed sterilization 20%(4) cases presented as Ectopic pregnancy. This is contrary to the report of Rathod et al (90%) and near to the Shah et al (12%).^{1&12} The proposed explanation for these ectopic pregnancies after tubal ligation is the formation of tuboperitoneal fistula or tubal recanalization; the fertilized ovum can pass through but the sperm cannot, so implantation occurs classically in the distal tubal segment.¹³ Women with an intrauterine device in place and those who have undergone tubal ligation are more likely to have an ectopic pregnancy than an intrauterine one if conception occurs.¹⁴

Most of the women 70%(14) presented in 1st trimester in our study whereas, Date SV et al have reported 60% of women presented in the 2nd trimester.⁴ Rock JA et al. observed "recanalization" and "tuboperitoneal fistulas" as the main cause for recanalization. They also noticed the development of endometriosis in the tip of the proximal segment of the ligated tube in a high percentage of patients. Before the development of the fistula, the tube appeared to have been dilated. Progressive extension of the endometriosis, perhaps due to internal pressure, may have resulted in penetration of the muscular wall of the tube with subsequent fistula formation either in the broad ligament or in the peritoneal cavity. PID, endosalpingitis, necrosis, or tubal atrophy are the other associate factors.¹⁵

60% of the women had a parity of.³ The same was reported by Rathod S et al¹. Date SV et al⁴ has contradicting observation of 50% of women with a parity of.² The parity is more in our study as most of the patients in the country have at least two children before opting for a permanent method of sterilization.

In our study resterilization is done by bilateral salpingectomy in 65% of cases and fimbriectomy in 35% of cases. With salpingectomy, additional benefits include improved contraceptive efficacy and elimination of subsequent ectopic pregnancies¹⁶ and also reduces the risk of epithelial ovarian carcinomas.

Guidelines are given in standards for female sterilization services, ministry of health and Family Welfare, Government of India, 2006 October. They are as follows. The operating surgeon should identify each, fallopian tube clearly, tracing right up to the fimbria. Excision of 1 cm of the fallopian tube should be done. The site of the occlusion of the tube must be in the isthmic portion 2-3 cm away from the uterine cornu.

Proper Counselling at the time of sterilization regarding the chances of failure has made our women report early. Rajesh Varma et al have observed that short intervals to failure may be due to negligence.¹⁷ This study has a positive correlation to the observation with our study.

Conclusion

The current study concludes that if sterilization failure occurs before one year, pregnancy may be attributed to operator fault causing tubal non-occlusion, and pregnancy in these cases is most likely to be intrauterine. Conversely, failed sterilization after one year is most likely due to regeneration of natural lumen through fistula formation or tubal recanalization and pregnancy is more likely to be ectopic. Proper counselling of patient before sterilization should be done & patient should be explained about failure rates in terms of both intrauterine and extrauterine pregnancies. Surgical procedures should document the presence of adhesions, difficulty in identifying tubes. Despite few failures, tubal sterilization remains the most common method of sterilization in controlling the population.

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