



A COMPARISON BETWEEN TWO METHODS OF FALLOPIAN TUBAL LIGATION FOR STERILIZATION OF WOMEN IN A LOW RESOURCE SETTING

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ABSTRACT

Objective: To compare two methods of tubal sterilization; modified Pomeroy and a modification added to modified Pomeroy's method, in a low resource setting. **Methods:** In this prospective study conducted from 2019 to 2021 in one thousand women, we compared Pomeroy's method with an other method in which a slight modification in the original modified Pomeroy's technique was introduced, in a very low resource rural community hospital with only basic operation theater facility. In modified Pomeroy's method, a loop of fallopian tube is resected and transfixed with 2-0 chromic catgut surgical suture material. In our study we added another modification to the modified Pomeroy's method, wherein the proximal end of the fallopian tube was additionally ligated with a 2-0 silk suture. The patients were followed up from 6months-2 years. **Results:** A failure rate of 0.4% was observed in women who underwent Modified Pomeroy's method in contrast to no failure in women in whom the proximal end of the tube was additionally ligated. **Conclusion:** Additional modification to the original modified Pomeroy's method of sterilization can be potentially promising in reduction of sterilization failure rate in parts of world where salpingectomy is less readily accepted.

KEYWORDS : Tubectomy, Pomeroy's, ectopic pregnancy, tubal segments, sterilization

INTRODUCTION

Tubal sterilization is a permanent method of contraception and is performed upon desirous women who have completed childbearing.¹ The procedure can be performed anytime during the menstrual cycle after pregnancy has been ruled out, in postpartum and post-abortion phases.² A retrospective cohort study reported a significant increase in uptake of salpingectomy as a contraceptive method from 2011 to 2016.³ Modified Pomeroy's method has emerged as the commonest method among various methods performed for tubal ligation because of its simplicity, safety, low failure rate and potential for reversibility (if needed). In this method a small loop of the fallopian tubes is resected and ligated with absorbable suture material. It can be performed along with cesarean section, laparoscopically as well through a mini-laparotomy incision. It has superseded other methods of salpingectomy like Lundgren (1881), Madlex (1910), Irwing (1924), Bishop and Weln (1930), Aldrige (1934), Krumer (1935), Uchida (1946) and Parkland (1960) etc. These methods vary in some parameters like method of tubal destruction, failure rates, complications and potential for reversibility.⁴

Failure rates vary with the age of the patient and the method of the tubal occlusion employed. The highest risk was found after clip sterilization (36.5/1000) and lowest after unipolar coagulation (7.5/1000) and post-partum salpingectomy (7.5/1000). The cumulative risk being highest (54.3/1000) for clip application when performed at a young age.⁵ In an Indian study the failure rate of modified Pomeroy's method was reported to be 0.4%.⁶ Out of these failures a significant majority comprises of tubal ectopic pregnancies with a mortality of 6%-10%.⁷

In this study we compared Pomeroy's method with other method in which a slight modification in the original modified Pomeroy's technique was introduced.

MATERIAL AND METHODS

The study was a prospective interventional study carried out in a very low-resource rural community hospital in north India from 2019 to 2021. The hospital had only one basic operating room without laparoscopic facilities. One thousand patients who had two or more living children and no maternal contraindications for the procedure were included in the study after informed consent. Patients were admitted after a thorough workup that included history, physical examination, relevant laboratory work, and clearance from the department of anesthesiology. Pregnancy was ruled out in all the patients. Patients were divided into two groups randomly. Two groups were comparable with regard to age and timing of tubectomy after childbirth.

In modified Pomeroy's method, a loop the of fallopian tube was resected and transfixed with 2-0 chromic catgut surgical suture material. In our study we added another modification to the modified Pomeroy's method, wherein the proximal end of the fallopian tube was additionally ligated with 2-0 silk suture. Salpingectomies done along with cesarean section were not included in the study.

Patients were contacted by telephone or through ASHA workers up to May 2022 for any news about pregnancy or other related symptoms.

Group A: Salpingectomy was done using modified Pomeroy's procedure using 2-0 catgut suture material. The fallopian tubes were transfixed first followed by a free surgical tie.

Group B: In this group salpingectomy was done using modified Pomeroy's method. Additionally, a transfixing suture with 2-0 silk was applied to the proximal tubal segment.

In both the groups procedure was done through a mini-laparotomy incision and the patient was under general anesthesia.

Data was collected, compiled, tabulated and statistical

analysis was done using SPSS 26. Statistical analysis was done by calculating percentages and calculation of p value. P value less than 0.05 was considered as statistically significant.

Approval for conduction of study was sought from institutional ethics committee. The procedures followed were in accordance with the ethical standards of the responsible committee on human experimentation (institutional) and with the Helsinki Declaration of 1975, revised in 2013.

Observations

Both the groups were comparable in the basic demographic and obstetric variables like age, parity and time of sterilization. [Table 1]

In group B no failures were reported during the follow up period while as in Group A two failures were reported out of which one was intrauterine and one ectopic pregnancy. One women reported pregnancy during 1st year and the other in second year after the procedure. The differences in the failure rates in the two groups were not statistically significant (p=0.72) [Table 2]

Table 1: Chart showing patient profile

Age	<25 years	25-30years	>30 years	P value
Group A	105(21%)	355(71%)	40(8%)	0.92
Group B	100(20%)	360(72%)	40(8%)	
Parity (P)	P2	P3	>P3	P value
Group A	90(18%)	360(72%)	50(10%)	0.71
Group B	100(20%)	350(70%)	50(10%)	
Time after delivery	Along with cesarean section	<6weeks post-partum	>6 weeks post-partum	P value
Group A	0	25(5%)	475(95%)	0.91
Group B	0	28(5.5%)	472(94.5%)	

Table 2: Chart showing ligation failure in the two study groups

Study Group	Failure (%)	Intrauterine Pregnancies (%)	Ectopic Pregnancies (%)	P-value
Group A (Modified Pomeroy's Method)	2(0.4%)	1(50%of failures)	7 (50% of failures)	0.72
Group B (Modified Pomeroy's method with additional modification)	Nil	Nil	Nil	

DISCUSSION

Women in this part of world do not consent easily for intra-uterine contraceptive device because of strong misconception of migration of the device into peritoneal cavity. The failure rate of Pomeroy's method has been reported as 0.3%-0.4% in the literature.^{6,8} Our study showed similar failure rate. In literature the commonest reason for failure in the first year of sterilization has been reported as improper sterilization procedure. In the subsequent years sterilization failures have been attributed to tubal recanalization and tubo-peritoneal fistula formation.⁹

The possible mechanisms for tubal recanalization and fistula formation are described below:

1. Tubo-peritoneal fistula formation: when tubes are ligated with absorbable suture i.e., chromic catgut the two ends fall apart after dissolution of the thread. Due to improper initial procedure the tubal ends remain open giving rise to the

proximal tubo-peritoneal fistula through which a sperm can travel and fertilize an ovum in the peritoneal cavity. This fertilized ovum can then travel and lodge in distal tubal segment, proximal tubal segment and even in uterus giving rise to an ectopic pregnancy or normal intra- uterine pregnancy.

2. Recanalization: when after salpingectomy the two tubal ends fail to fall apart, as may be the case in case of adhesion formation or use of non-absorbable suture for salpingectomy, recanalization of the tubal ends may take place by epithelial regeneration at the resected tubal ends.¹⁰ The recanalized tube allows the transport of the sperm and ovum and consequent fertilization. Depending on the function and caliber of the recanalized tubal segment, the fertilized ovum may get implanted in the fallopian tube or the uterine cavity; and hence result in an ectopic or a normal intra-uterine pregnancy. Rarely recanalization by formation of an epithelial tract along the free margin of mesosalpinx can still occur even if the tubal ends are well apart.^{9,11}

By applying a silk suture to the proximal segment of the tube the chances of formation of a tubo-peritoneal fistula as well as recanalization are highly reduced.

Results in our study were encouraging as no failures were reported with a subtle modification in the original modified Pomeroy's method. Though the difference in sterilization failure rate was statistically insignificant, even one ligation failure can mean a lifelong burden for an under privileged family and can make the innocent child feel unwanted. Cost of the procedure and operative time were not significantly increased in our study. Although studies with a larger sample sizes are required to recommend this modification in routine.

Drawback of the method

In cases where need for tubal sterilization reversal arises, the chances of successful reversal might not be very good because the success rate has been found to depend upon the length of the tubal remnants.^{12,13} Also strong body of evidence from the last decade recommends salpingectomy instead of Pomeroy's method for sterilization and additional prevention of ovarian cancer.^{14,15,16} In our area we couldn't have practiced this method because many patients return for tubal recanalization procedure for one reason or other and in some cases religious faiths are involved as well.

CONCLUSION

The new tubal sterilization method is technically sound, feasible and easily demonstrated. It could bring down sterilization failure rate where salpingectomy is not acceptable. Further maternal morbidity and mortality related with ectopic pregnancy in ligation failures could be brought down. Although studies with a larger sample sizes are required to recommend this modification in routine.

Conflicts of interests: None.

Funding source: None

Author contribution: All authors made substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data; took part in drafting the article or revising it critically for important intellectual content; gave final approval of the version to be published; and agree to be accountable for all aspects of the work.

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