

## PREGNANCY AFTER TUBAL LIGATION

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### SUMMARY

191 patients presenting with pregnancy following tubal sterilization over a twelve year period from January 1983 to December 1994 are analysed. An attempt has been made to classify unplanned pregnancies in relation to the apparent or presumed aetiology of the failure. Modified Pomeroy's method accounted for 48.16% tubectomies and laparoscopic Yoon's ring method accounted for 51.83%. Of all procedures 46.07% were performed in a camp setting. Majority of the failures were in the concurrent post partum and post abortal groups, 69.63% as compared to the interval groups (45.54%). Tubal ectopic pregnancies as a percentage of pregnancies following failure of sterilization was 10.9%. Technical failure caused by improper ligation accounted for 38.04% failure in the Modified Pomeroy's method and 58.58% in the laparoscopic Yoon's ring method.

### INTRODUCTION

Almost all known means of controlling procreation are associated with one or several side-effects and failure. Abstinence and castration are the only two contraceptive methods which have perfect records of success for both men and women. As the search for the perfect contraceptive must and will continue. Current methods need to be re-assessed with particular reference to their

failure rates and the risk-benefit ratio.

"Permanent" contraception for the female as provided by sterilization is rapidly gaining popularity throughout the world. In this paper, an attempt has been made to classify the unplanned pregnancies following tubal sterilization in relation to the apparent or presumed aetiology of the failure (method failure, technical failure and cause unknown).

### SUBJECTS & METHODS

This is a study of 191 women with pregnancies following failure of tubal ligation,

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admitted to the Department of Obstetrics and Gynaecology, SSG Hospital and Medical College, Baroda from January 1983 to December 1994. The procedures are categorized according to the route of entry into the peritoneal cavity, whether the procedure was accomplished under direct vision by laparotomy or via the laparoscope. The Yoon's ring method was the technique employed for laparoscopic tubal ligations. Modified Pomeroy's was the technique primarily employed for the tubal ligation by mini laparotomy. Most of these tubal ligation procedures were performed outside our hospital in a camp or hospital setting. After confirmation of pregnancy by history, clinical examination and if required by ultrasonography, the pregnancies were terminated and re-sterilization performed, if the patient so desired. 21 patients of tubal ectopic pregnancy were treated by salpingectomy.

#### ANALYSIS

Table I shows the distribution of subjects by type and place of tubal ligation. Out of 191 pregnancies reporting following failure

of sterilization, 92 (48.16%) were by Modified Pomeroy's or conventional method and 99 (51.83%) by laparoscopic Yoon's ring method. 38 (46.07%) were performed in camps and 103 (53.92%) were performed routinely in various hospital settings.

Table 2 shows the timing of operation in relation to a pregnancy event. Out of the 17 (40.31%) procedures performed post-partum, 58 (75.32%) were by conventional method. Majority 42 (42.42%) of the laparoscopic sterilizations were performed as an interval procedure.

Table 3 indicates the distribution of intrauterine and extra-uterine pregnancies. There were 21 (10.99%) tubal ectopic pregnancies as percentage of pregnancies associated with tubal sterilization. Of these 14 (66.66%) were sterilized by Modified Pomeroy's method. Of the 170 (89.0%) intrauterine pregnancies, 89 (52.35%) were first trimester and 54 (31.76%) reported in second trimester. 27 (15.9%) delivered at term.

In table 4 the sterilization - conception interval is outlined. 125 (65.44%) pregnancies occurred one to five years after

**Table I**  
**DISTRIBUTION OF SUBJECTS FOR TYPE AND PLACE OF TUBAL LIGATION**

	No. (%)	Convntional	Laparoscopic
Total	191 (100.0)	92 (48.16)	99 (51.83)
Camp	88 (100.0)	39 (44.31)	49 (55.68)
Routine	103 (100.0)	53 (51.45)	50 (48.54)

**Tabl II**  
**DISTRIBUTION BY TIMING OF OPERATION**

Timing	Conventional No. (%)	Laparoscopic No. (%)	Total No. (%)
Post Partum	58 (75.32)	19 (33.63)	77 (100.0)
Post Abortal	18 (32.14)	38 (67.85)	56 (100.0)
Interval	16 (27.58)	42 (72.41)	58 (100.0)

**Tabal III**  
**DISTRIBUTION OF INTRA-UTERINE AND  
EXTRA-UTERINE PREGNANCY**

Ectopic Pregnancy No. (%)	Intra-uterine Pregnancy No. (%)
21 (10.99)	170 (89.0)

Laparoscopic	Conventional	I Trimester	Mid-trim	Fullterm Preg.
07 (33.33)	14 (66.66)	89 (52.35)	54 (31.76)	27 (15.88)

**Table IV**  
**STERILIZATION CONCEPTION INTERVAL**

Sterilization Conception interval	No.	(%)
Upto 1 year	38	(19.89)
1 to 5 yrs.	125	(65.44)
5 to 13 yrs.	28	(14.65)

**Table V**  
**OUTCOME OF PREGNANCY FOLLOWING FAILURE**  
**OF TUBAL LIGATION**

Method Accepted	No.	(%)
Conventional T.L.	84	(43.97)
Laparoscopic T.L.	61	(31.93)
Salpingectomy for ectopic Pregnancy	14	(10.99)
Cu. T insertion	07	(03.66)
Refusal to accept any method	18	(09.42)

**Table VI**  
**ANALYSIS OF POSSIBLE CAUSES FOR CONVENTIONAL T.L.**  
**AND LAP. T.L. FAILURE**

	Conventional (n=92)	Laparoscopic (n=99)
A) Improper site of ligation	35 (38.04)	68 (58.58)
B) No evidence of ligation	31 (33.69)	20 (20.20)
C) Tuboperitoneal Fistula	06 (6.52)	06 (6.06)
D) Cause could not be made out due to refusal for reesterilization or inconclusive data	20 (21.73)	15 (16.3)

the sterilization procedure and 38 (19.9%) occurred within the first year.

Table 5 shows the outcome of pregnancy resulting from failure of primary procedure. 84 (43.97%) chose to undergo conventional tubal ligation, 61 (31.93%) chose laparoscopic ligation. 18 (9.42%) refused to accept any contraceptive

measure.

Table 6 tries to analyse the apparent or presumed aetiology for failure of sterilization. In the laparoscopic Yoon's ring method 58 (58.58%) failures were probably due to improper site of ligation, the common sites being the round ligament (7 patients) the mesosalpinx below the tube (20 patients)

and the ampulla being partially occluded in 23 patients. No evidence of Yoon's ring on one side was seen in 20 (20.20%) due to either slippage of an applied ring, or failure to apply the ring. In the conventional method group 35 (38.04%) failures were due to improper ligation over the round ligament, ampulla or fimbriae and in 31 (33.69%) there was no evidence of interruption in tubal continuity on one side. In 35 (18.32%) no cause could be made out.

### DISCUSSION

This study was carried out on 191 women reporting with intrauterine or extrauterine pregnancy following tubal sterilization. An attempt has been made here to classify the pregnancies in relation to the apparent or presumed aetiology of the failed sterilization. It is rather difficult to provide incidence of failure rates by different methods. The overall failure rate for the Modified Pomeroy's procedure has been reported as between 0.17 and 0.5% (Garb 1957, White 1966).

The silastic band technique gained popularity in the 1970's, as an alternative to the unipolar coagulation that was being promoted throughout the world by the United States Agency for International Development (USAID). Poliakoff and Yoon (1978) report an overall pregnancy rate of 1%. But, 45% of these were luteal pregnancies and 30% were due to improper application of rings. In our study in 58 (58.58%) the apparent or presumed cause of failure was improper site of application of the Yoon's ring.

When a patient with a previous tubal ligation develops any of the signs and

symptoms of pregnancy, the diagnosis of extrauterine pregnancy has to be very strongly considered, as the ratio of ectopic to intrauterine pregnancy is higher among pregnancies occurring after sterilization failure than in the general population (Brenner et al 1976). In our study 21 (10.9%) women reported with tubal ectopic pregnancies. Out of these, 14 (66.6%) were following Modified Pomeroy's method of sterilization. Ectopic pregnancy occurs with a greater frequency following sterilization as oviduct is reduced in size. Thus, the small sperm can traverse this lumen, but the migration of the fertilized ovum is blocked.

Majority of the failures were in the concurrent postpartum and post-abortal (69.63%) groups as compared to the interval groups (45.54%). Hughes (1977) observed higher failure rate when tubal ligation is performed with termination of pregnancy or in the post partum period. Thickened edematous tubes lead to increased chances of improper occlusion of the tubal lumen.

In our study, technical failure caused by improper ligation or improper site of ligation accounted for 38.04% of failures in the conventional method and 58.58% failures in the laparoscopic method groups respectively. Factors contributing to technical error may be due to a large number of patients, improperly selected in a camp set up, error in identification of tube by operator and inadequate training of operating surgeon. Correct concepts of anatomy of the tube, adequate visualization and identification and perfect ligation are mandatory to reduce the numbers of technical failures. Intermittent surgical supervision of medical officers and surgeons involved in sterilization procedures along with

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continuing medical education sessions will go a long way in reducing failure rates and ensuring a standard quality of work performance.

### CONCLUSIONS

Notoriously there is very little information in the literature regarding histology of the process of re-establishment of patency of the fallopian tube after tubal ligation. However, technical failures account for a large percentage of failure following

tubectomy and much can be done to reduce this figure.

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