Original Research Article

A study of failure of female sterilisation

Shalini Shamrao Gadale[1], Kranti Venkatrao Kendre[2*]

[1]Professor and HOD, Department of OBGY, Gouri Devi Institute of Medical Sciences and Hospital, Durgapur, West Bengal 713212, INDIA.
[2]Professor, Department of OBGY, MIMSR Medical College Latur, Maharashtra, INDIA.
Email: shalinikarad787@gmail.com

Abstract

In the present study we evaluated 42 cases of failure of female sterilization. All patients were admitted for either medical termination of pregnancy with resteriliation or for delivery with resterilisation and some had undergone medical termination of pregnancy or deliver at other hospitals and them come for resterlization. Out of 42 patients 39 patients have undergone resterilization in this institution one patient absconded after second trimester medical termination of pregnancy one patient delivered by preterm vaginal delivery and then refused resterilization and one patient come in antenatal clinic at 12 to 14 weeks of gestation but she was lost follow up in detail, the history by previous sterilization, sterilization conception interval place of surgery time of surgery. i.e. whether interval postpartum of medical termination of pregnancy with sterilization was taken from the patient herself or from her relatives or from previous discharge card from this we also collected information regarding the type of surgery i.e. whether abdominal or laparoscopy, and specific intraoperative findings either told by surgeon for her or detail available on discharge card. Out of 42 cases, 8 cases come as an acute emergency of ruptured ectopic pregnancy. Emergency laparotomy finding and the cases of sterilization failure were noted Resterlization was done at the same time in these patients. Remaining 34 cases were of uterine pregnancy which 31 undermentresterilization. In these patients intraoperative findings of previous sterilization and probable causes of failure have been noted. In this study, one patient is of twice failed sterilization we did bilateral salpingectomy in this patients.

Key Words: Sterilization pregnancy and medical termination.

***Address for Correspondence:**
Dr. Kranti Venkatrao Kendre, Professor, Department of OBGY, MIMSR Medical College Latur, Maharashtra, INDIA.
Email: shalinikarad787@gmail.com
Received Date: 10/01/2018 Revised Date: 14/02/2018 Accepted Date: 17/03/2018
DOI: https://doi.org/10.26611/1012533

Access this article online

Quick Response Code:

Website: www.medpulse.in

Accessed Date: 20 March 2018

INTRODUCTION

Female sterilization is very widely used and effective method of permanent contraception. It is widely used in both the developed and developing countries for controlling the family size. However, no method of contraception has been found to be without failure. The Failure rate varies with each individual technique, as well as the expertise of the surgeon. Many women select sterilizations because it is safe, effective, economical and one time method. Any pregnancy occurring because of failure of this procedure causes a lot of concerned to the couple and also to the surgeon, especially when medico legal question arises. Moresoever female sterilization is a very commonly practiced permanent contraception method. Under the family planning and welfare programme in most of the developing countries. The failure of sterilization adversely affects this programme and may be a major set back to the a programme. Female sterilization by mini laprotomy approach using pomeroy's method has been found to be more effective than laproscopic and colpotomy method. Thus the route and method of sterilization has great deal of impaction the failure rate of female sterilization. Pregnancy following sterilization may be a topic and it may be life threatening. This shows the grin face of a dreaded complication of pregnancy following sterilization. Due to all these factors many studies have been carried out to find out the failure rate and the causes of failure. As a Gynecologist we are aware that there is no perfect method of sterilization. Just by accepting the fact that sterilization failure is expected, does not give proper justice to the subject. Whenever failure occurs, cause should be studied to prevent further

How to cite this article: Shalini Shamrao Gadale, Kranti Venkatrao Kendre. A study of failure of female sterilisation. *MedPulse – International Journal of Gynaecology.* March 2018; 5(3): 38-47. http://medpulse.in/Gynacology/index.php

sterilization failures. In this study, an effort has been made to study the female patients coming with the failure of previous sterilization, so as to minimize the sterilization failure in future.

MATERIAL AND METHOD

All the patients coming to hospital as cases of failure of female sterilization were admitted for either medical termination of pregnancy with resterilization or for delivery with resterilization and some had undergone medical termination of pregnancy or delivery at other hospitals and then came for resterilization. Out of 42 patients, 39 patients have undergone resterilization in this institution. One patient absconded after second trimester medical termination of pregenancy, One patient delivered by preterm vasinal delivery and than refused resterilization and one patient came antenatal clinic at 12 to 14 weeks of gestation but she was lost to follow- up. In detail, history of previous sterilization, sterilization conception interval, place of surgery, time of surgery i.e. whether interval, postpartum or medical termination of pregnancy with sterilization was taken from the patient herself or from her relatives or from previous discharge card. From this, we also collected information regarding the type of surgery i.e. whether abdominal or laproscopy, any specific intraoperative findings either told by surgeon to her or details available on discharge card. Out of 42 cases, 8 cases came as an acute emergency of ruptured ectopic pregnancy. Emergency lapratomy was done and intraoperative findings and the causes of sterilization failure were noted. Resterilization was done at the same time in these patients. Remaining 34 cases were of uterine pregnancy of which 31 underwent resterilization. In these patients intraoperative findings of previous sterilization and probable causes of failure have been noted. In this study one patient is of twice failed sterilization. We did by lateral salpingectomy in this patient. There was no mortality in this study.

OBSERVATIONS

This is a prospective study of 42 cases of failure of female sterilization carried out in this study. These patients came either in the OPD or as an acute emergency as ruptured ectopic pregnancy, with history of previous female sterilization.

Table 1: Types of Previous Sterlisation

Sr. No.	Previous sterilisation	No. of cases	Percentage
1.	Abdominal (Minilap)	40	95.24
2.	Laparoscopic	2	4.76
	Total	**42**	**100.00**

Out of 42 failed sterilisations, 40 (95.24%) had undergone sterilization previously by abdominal route i.e. by modified Pomeroy's method and 2 (4.76%) had undergone laparoscopic sterilization previously.

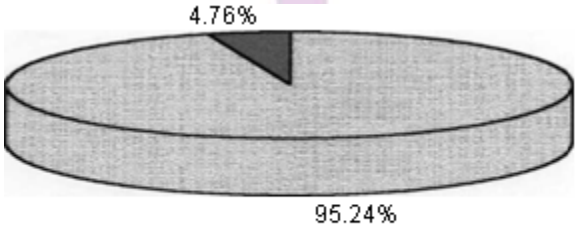

Figure 1:

Table 2: Period of previous Sterilisation

Sr. No.	Period	Mod. Pomeroy's Method	Laparoscopic	Total	Percentage
1.	Postpartum	25	-	25	59.52
2.	Postabortal (MTP with sterilisation)	3	-	3	7.14
3.	Interval	11	2	13	30.96
4.	1st Postpartum with resterilisation and 2nd MTP with resterilisation	1	-	1	2.38
	Total	**40**	**2**	**42**	**100.00**

We studied 42 cases of failure of female sterilisation. 25 cases were previously operated by modified Pomeroy's method in puerperal period. 3 cases were previously operated in postabortal period and they had undergone suction evacuation and sterilisation by modified Pomeroy's method. 13 cases had undergone sterilisation previously in their interval period. Out of them, 11 cases had undergone sterilisation by modified Pomeroy's method and 2 cases by laparoscopy method. 1 case is of twice failed sterilisation. At first time she had undergone sterilisation by modified Pomeroy's method in her puerperal period and second time she underwent suction evacuation with resterilisation. No case of lower segment caesarean section with sterilization coming with failure was found during this study.

Table 3: Outcome of pregnancy

Outcome of pregnancy	Modified Pomeroy's method	Laparoscopic method	Total	Percentage
Intrauterine pregnancy	32	2	34	80.95
Ectopic pregnancy	8	-	8	19.05
Total	**40**	**2**	**42**	**100.00**

We have studied 42 cases of failure of female sterilisation out of them 34 (80.95%) cases were of uterine pregnancy as a result of failure of previous sterilisation. Out of them 2 had previously undergone laparoscopic sterilisation and 32 cases had undergone sterilization by Modified Pomeroy's method 8 (19.05%) failure cases of modified Pomeroy's method had ectopic pregnancy and came to our institution with rupture of tubal ectopic pregnancy.

Uterine Ectopic

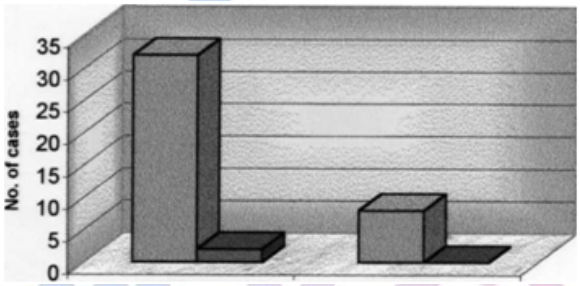

Figure 2:

Table 4: Interval between primary sterilization and conception

Sterilization-conception interval	Modified Pomeroy's method	Laparoscopic method	Total	Percentage
Less than 6 months	1	-	1	2.31
6-12 months	2		2	4.76
12-24 months	5		5	11.90
More than 24 months	32	2	34	80.95
Total	**40**	**2**	**42**	**100.00**

In our study, sterilisation-conception interval varied. Shortest interval was 4 months in one patient and the longest interval was 14 years. 80% cases were conceived 2 years after sterilisation. Of them, 2 cases were of laparoscopic sterilisation previously. 10% cases conceived between 12-24 months i.e. 1-2 years after sterilisation, 9% cases conceived between 6-12 months and only one case reported within 6 months after primary sterilisation.

Table 5: Place of previous sterilization

Sr. No.	Place of Surgery	Pomeroy's Method	Laparoscopy	Total	Percentage
1.	Teaching institute	7	-	7	16.67
2.	Primary health centre	23	-	23	54.76
3.	Civil dispensers and Rural hospital	10	2	12	28.57
	Total	**40**	**2**	**42**	**100.00**

Out of 42 cases of failure of female sterilisation 7 (16.67%) patients had previously undergone sterilisation in our medical college hospital by modified Pomeroy's method 23 (54.76%) cases were operated previously at primary health centres by modified Pomeroy's method. 10 (23.81%) cases were operated for tubectomy by same method in civil dispensary and rural hospital. 2 (4.76%) cases had undergone laproscopic sterilization at Rural Hospital, Parli Vaijanath.

Table 6: Treatment given and the distribution of procedures along with sterilization

Sr. No.	Procedures	No. of cases	Percentage
1.	Postpartum or puerperal resterilisation	7	17.95
2.	Extra-amniotic ethacridine lactate instillation with resterilisation	12	30.77
3.	Suction evacuation with resterilisation	8	20.51
4.	Lower segment caesarean section with resterilisation	1	2.56
5.	Laparotomy for ruptured ectopic pregnancy with resterilisation.	8	20.51
6.	Postabortal (Abortion outside this hospital) with resterilisation.	1	2.56
7.	Check curettage with resterilisation	2	5.13
	Total	**39**	**100.00**

Out of 42 cases of failed tubal sterilization we did resterilisation of 39 cases. Out of the remaining 3 cases, 1 patient absconded after second trimester medical termination of pregnancy, 1 patient refused resterilisation after preterm vaginal delivery and 3rd patient came in antenatal clinic at 12 to 14 weeks of gestation but was lost to follow-up. Out of 39 cases, which had undergone resterilisation, 7 cases underwent resterilisation in puerperal period. Out of these 3 patients had delivered at home and then came to our hospital for resterilisation. Of which in 1 case, the baby delivered at home, was fresh still birth and then patient came after 15 days for resterilisation. 4 patients delivered in this institution and underwent resterilisation 2 days after delivery. 12 cases underwent second trimester medical termination of pregnancy i.e. extra-amniotic ethacridine lactate instillation, they get aborted completely and then underwent resterilisation. Out of these 12, one case was of twice failed sterilisation. 8 cases came to us in 1st trimester and suction evacuation with resterilisation was done. One patient came to us with full term pregnancy with failure of sterilisation with central placenta praevia in bleeding phase. We did lower segment caesarean section with resterilisation in this patient 8 cases came as an acute emergency i.e. with ruptured ectopic pregnancy. We had to do laparotomy with resterilisation. 1 patient had undergone medical termination of pregnancy in private hospital and then came to this institute for resterilisation.
2 patients came to us with incomplete spontaneous abortion, so check curettage with resterilisation was done

Table 7: Sterilization failure etiology by intraoperative findings for modified Pomeroy's method

Sr. No.	Intra-operative findings	No. of cases	Percentage
1.	Technical error		
	a. Intact fallopian tube on one side i.e. one tube not ligated	6	16.22
	b. Both sided tubes not ligated	4	10.81
	c. Tubectomy done at fimbrial end	10	27.03
	d. Incomplete resection of tube	11	29.73
	Total	**31**	**83.78**
2.	Recanalisation	2	5.41
3.	Tuboperitoneal fistula	1	2.70
4.	Unknown	3	8.11
	Total	**37**	**100.00**

Out of 42 reported cases of failure of sterilisation, we did resterilisation and intraoperative findings for probable aetiology of failure have been noted in 39 cases. Intra-operatively, we found that in 31 cases, there was technical failure. Out of them, in 6 cases, only one tube was ligated and there was no evidence of ligation in other sided tube. In 4 cases, both tubes were not ligated. In 10 cases, the tubal ligation was done at very much lateral end i.e. at fimbrial end means partial fimbriectomy had been done in these patients. In remaining 11 cases, there was unilateral or bilateral incomplete resection of the tubes. In 2 cases, there was recanalisation of the tubes. In 1 case, there was formation of tuboperitoneal fistula. In remaining 3 cases, we could not found ligation of the tubes because of the rupture of the tubal pregnancy and the anatomy of tube was distorted due to repture at that side.

Table 8: Intraoperative finding at the time of resterilisation of previous laparoscopic sterilization

Sr. No.	Intraoperative findings	No. of cases	Percentage
1.	No evidence of siliastic band to one tube, but it was on round ligament on that side	1	50.00
2.	No evidence of siliastic band to both sided tubes	1	50.00
	Total	**2**	**100.00**

In our study, there were 2 cases of failed female sterilization who had undergone previous sterilization by laparoscopic method. Both of them have undergone resterilisation in this institute. In one case, there was no evidence of siliastic band to 1 tube and there was evidence of siliastic band to the round ligament on that side. Other tube was having siliastic band.

In the other case, there was no evidence of siliastic band to either tube; neither was it applied to any other structure in the pelvic cavity.

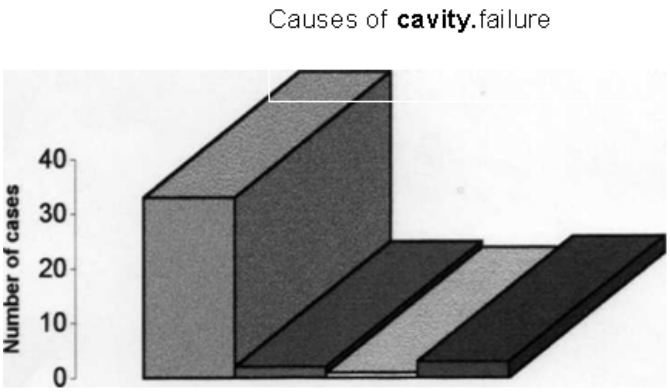

Figure 3:

While studying causes of failure of female sterilization, we found that 33 cases had failed due to technical errors. Application of siliastic band to either only 1 tube or due to failure to apply siliastic band to both the tubes or application of siliastic band to round ligament are the causes of failure of laparoscopic sterilization In most of the cases of previous sterilisation by modified Pomeroy's method, incomplete resection and technical error was the main probable cause of failure. In 2 cases, the cause of failure was recanalisation of proximal and distal tubal segment. In 1 case, there was evidence of tuboperitoneal fistula; it might be the cause of failure. In 3 cases of ruptured ectopic pregnancies, we could not find the cause of failure due to distorted anatomy of the tube on the ruptured side.

DISCUSSION

Female sterilisation in India is one of the major methods of contraception in Government Family Planning Programme. The present study was carried out in 42 patients of failure of female sterilization in this Institution. Out of 42, 39 patients underwent resterilisation in this institution. One patient refused resterilisation after preterm delivery; one absconded after medical termination of pregnancy and one patient came to antenatal clinic at 12 -14 weeks of gestation and then lost to follow-up. Intraoperative findings in these patients have been noted and cause of failure detected. One patient in this study is twice failed sterilisation. In this study the following factors were compared with that of other studies:

- Incidence of failure rate
- Place of previous surgery
- Outcome of pregnancy
- Sterilisation conception interval
- Intraoperative findings and causes of failure

Table 1: Failure rates quoted by various studies

Study	Year	Total sterilisation	Failure rate
Veerbala N. Parikh	1986	1376	1 - 2 %
M. L. Kurtadikar and C. H. Sathe	1981	5400	0.07%
Suwachai *et al*	1969 - 88	30856	0.12 %
Gupta S. Dube	1990	5765	0.17%
Present Series	1998-99	1626	0.43 %

In the present series the failure rate for female sterilisation is 0.43%. Failure for other centres could not be studied due to lack of information regarding total number of sterilisation performed there. From the above all studies, the highest failure rate was reported by Veerbala N. Parikh in 1986 (1 - 2%) and the lowest failure rate was reported by M. L. Kurtadikar and C. H. Sathe.

Table 2: Type of previous sterilization

Sr. No.	Study	Type of sterilisation	
		Abdominal	Laparoscopic
1.	RakshaArora *et al* (1995)	69.31%	30.70%
2.	KurtadikarandSathe (1982)	95.88%	3.22%
3.	Present series (1998 - 99)	96.00%	4.00%

It is seen from above table that failure rate of minilaparotomy is more i.e. 69.31% in Raksha Arora's study and was 95.88 in Kurtadikar's study, which is comparable to present study i.e. 96.00% This may be as the result of more patients undergoing sterilisation by inilaparotomy as a method of choice. Moreso, the present study being conducted in a rural area, the laparoscopic sterilisation as a method is not commonly used.

Table 3: Time of previous sterilization

Sr. No.	Study	Percentage of cases in Sterilisation period		
		Postpartum	Postabortal	Interval
1.	DeeptiDongaonkar *et al* (1991)	36.36	31.8	31.8
2.	Mondal and Day (1978)	9.0	45.5	45.5
3.	Veerbala (1986)	80	-	20
4.	RakshaArora (1975)	69.3	16.5	14.2
5.	Present series (1998 - 99)	61.9	7.2	30.9

In the present series, there are more cases of failure of sterilisationwho had undergone previous sterilization in their postpartum period (61.9%), which is comparable to RakshaArora (1995), DeeptiDongaonkar (1991) and Veerbala (1986). As reported by Mondal and Day in 1978, failure rate encountered in postpartum period (9.1%) is less than postabortal and interval sterilization.

Table 4: Incidence of intrauterine and ectopic pregnancy

Sr. No.	Studies	Intrauterine %	Ectopic %
1.	RakshaArora	57.14	42.85
2.	Swachai *et al*	81	19
3.	DeeptiDongaonkar *et al*	95.5	4.5
4.	Herbert Paterson *et al*	66.1	32.9
5.	Kurtadikar *et al*	95.17	4.83
6.	Present series	80.96	14.04

From all above studies including present series it is seen that uterine pregnancy following sterilisation is high as compared to ectopic pregnancy as a result of failure of failure of sterilisation.

Table 5: Incidence of ectopic pregnancy following minilaparotomy and laparoscopic sterilization

Sr. No.	Studies	Intrauterine pregnancy		Ectopic pregnancy	
		Minilaparotomy	Laparoscopic	Minilaparotomy	Laparoscopic
1.	Suwachai *et al* (1988)	48.6%	32.4%	8.1%	10.8%
2.	Present series	76.19%	4.76%	19.04%	-

From above studies, it is seen that the rate of ectopic pregnancies following minilaparotomy and laparoscopic sterilisation is same in study by Suwachai *et al*. But in present series, all cases of ectopic pregnancies are following previously minilaparotomy method of sterilisation. No case of ectopic pregnancy following laparoscopic sterilisation has been seen by us

Table 6: Sterilisation conception interval

Sr. No.	Study	<6 months	6 months to 1 year	1-2 years	> 2 years
1.	Suwachai *et al* (1988)	18.9%	35.13%	18.9%	27.02%
2.	Deepti Dongaonkar *et al* (1991)	6.8%	29.5%	13.6%	50%
3.	Veerbala (1986)	-	20%	13.3%	66.7%
4.	Present series (1998-99)	2.34%	4.76%	11.9%	76.19%

The cases reporting as a pregnancy within 6 months following female sterilisation were the least in all above studies. The incidence was less during 1-2 years after sterilisation, but maximum after 2 years. This is same in our study also. The maximum duration of sterilisation conception interval was 14 years in present study.

Table 7: Place of previous sterilization

Sr. No.	Studies	Place of surgery (previous)		
		Teaching institute	Primary health centre	Rural hospital and Civil dispensaries
1.	Raksha Arora *et al* (1991)	54.64%	11.36%	34.9%
2.	Present study	16.6%	54.8%	28.6%

From above table, it is seen that the rate of failure of female sterilisation is more at teaching institutional levels in study by Raksha Arora *et al* (1991) But in present study, the failure rate is more in cases who had undergone sterilisation at primary health centre. This is because more cases are being operated for sterilisation at primary health centers in rural area.

Table 8: Outcome of failure cases

Sr. No.	Outcome of failure case	No. of cases in studies		
		Veerbala	Kurtadikar	Present series
1.	Termination + resterilisation	10(66.7%)	33 (56%)	23 (54.8%)
2.	Termination, refused resterilisation	-	1 (0.1%)	1(2.3%)
3.	Normal delivery followed by resterilisation	3(2.0%)	22 (37.3%)*	7(16.7%)
4.	Lower segment caesarean section + resterilisation	2 (13.4%)	2(3.3%)	1(2.3%)
5.	Normal delivery, refused resterilisation	-	1(0.1%)	1(2.3%)
6.	Laparotomy for ectopic pregnancy with resterilisation	-	-	8(19.04%)
7.	Diagnosed as failure but did not come for follow-up	-	1(0.1%)	1(2.3%)
	Total	**15**	**59**	**42**

In the present study majority of patients (54.8%) came to this institute for termination of pregnancy with resterilisation, which is the same as in the study of Veerbala (66.7%) and Kurtadikar (56%) 2 cases in both studies (Kurtadikar 1982 and Present study) refused resterilisation after normal delivery and termination. Out of the remaining maximum cases came after normal delivery for resterilisation. In present study it is seen that about 19.4% cases had came as an acute emergency with ruptured tubal pregnancy.

Table 9: Distribution of cases for medical termination of pregnancy with resterilisation

Sr. No.	MTP type	Studies	
		Veerbala (1986)	Present series
1.	Ethacridil lactate instillation with resterilisation	10%	60%
2.	Suction evacuation with resterilisation	90%	40%

In study by Veerbala (1986), maximum cases (90%) had came early in the first trimester for MTP with resterilisation. Whereas maximum cases (60%) in the present study, came late in the 2nd trimester for MTP with resterilisation. They underwent second trimester MTP and then resterilisation after the abortion. This finding compares with that of Kurtadikar and Sathe (1982). They stated that some cases have a tendency to come late for advice. This factor in present study may because of cases coming from rural area.

Table 10: Intraoperative findings in patients of failure due to technical error

Sr. No.	Intraoperative findings	Studies			
		Veerbala	Mondal *et al*	Kurtadikar *et al*	Present study
	Total	12	5	48	31
1.	One sided tube not ligated	8	4	33	6
2.	Both sided tube not ligated	1	-	-	4
3.	Incomplete resection of the tube	2	-	13	11
4.	Tubectomy done at fimbrial end	1	1	2	10

Veerbala Parikh (1995), Mondal *et al*, Kurtadikar and Sathe reported that, in technical error, the major mistake of surgeon is failure to identify and ligate one tube. In the present series, the major error done by surgeon is incomplete resection of tubal segment and then tubectomy done at fimbrial end

Table 11: Causes of failure of laparoscopic sterilization

Sr. No.	Studies	Technique failure	Reanastomosis	Unknown
1.	RakshaArora (1995)	7 (64%)	2 (1.8%)	2 (1.8%)
2.	Kurtadikar (1981)	3 (100%)	-	-
3.	Present series	2 (100%)	-	-

Again from above table, it is seen that all the cases of failure of sterilisation by laparoscopic surgery in the study of Kurtadikar *et al* (1981) and in the present study and in the study of RakshaArora 64% were because of technique error or operator's errors such as failure to apply siliastic band to one or both the tubes or application of band to the round ligament.

Table 12: Causes of failure of female sterilization by intraoperative findings by minilaparotomy route

Sr. No.	Studies	Causes			
		Technical error	Recanalisation	Tubo peritoneal fistula	Unknown
1.	Mondaland Day (1978)	81.8%	9.09%	-	9.09%
2.	Veerbala Parikh (1986)	93.4%	6.6%	-	-
3.	KurtadikarandSathe (1982)	90.56%	-	1.8%	7.5%
4.	RakshaArora *et al* (1995)	5.8 %	58.8%	17.6%	17.6%
5.	Present series (1998 -99)	84.62%	5.13%	2.56%	7.69%

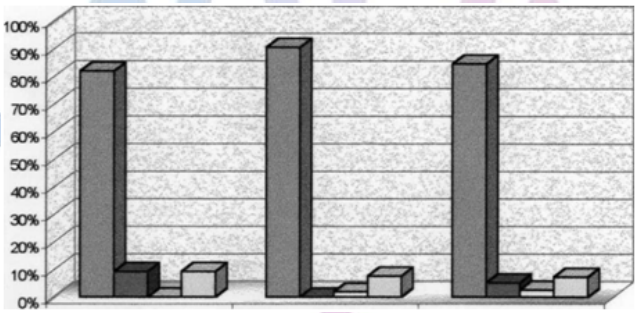

Figure 4:

From most of the above studies it is clearly evident that most common cause of failure of female sterilization is technical error of surgeon. Mondal and Day (1978) reported 75% of their cases of failure of sterilization were due to operator's error. Dr. C. H. Sathe and Kurtadikar have also reported that in 98.3% cases, technical failure is the major cause of failure of sterilization. Veerbala (1986) proposed the same causes of failure as in our study. But the finding noted by Raksha Arora *et al* (1991) was that 58.8% cases of failure were because of tubal recanalisation. "Technical failure due to adhesions as a cause of failure had been proposed by RakshaArora *et al* (5.8%) and Deepti Dongaonkar *et al* (18.8%)

SUMMARY AND CONCLUSION

A study of 42 cases of failures of female sterilization was carried out from January 1998 to January 2000 in the Department of Obstetrics and Gynecology, at Swami RamanandTeerth Rural Medical College and Hospital, Ambajogai, Dist. Beed. In this study, 95.24% patients were of uterine pregnancy and 4.76% of ectopic pregnancy. Out of these, 40 cases were of failure of sterilization by modified Pomeroy's method and 2 cases were of laparoscopic sterilization. In this study, one case was of twice failed sterilization. All ectopic pregnancies were following modified Pomeroy's method. No ectopic pregnancy was found after failure of laparoscopic sterilization. In all cases of ruptured ectopic pregnancy we did exploratory laparotomy with resterilisation by modified Pomeroy's method on the intact tube. We did resterilisation in 39 patients either after MTP or after

delivery and of the remaining 3 patients, 1 refused resterilisation, 1 absconded after medical termination of pregnancy and 1 was lost to follow-up. In case of twice failed sterilisation we did bilateral salpingectomy. In the remaining cases, resterilisation was done by modified Pomeroy's method. The majority (59.54%) of failures occurred after postpartum sterilisation. Maximum patients (54.8%) of failure had undergone previous sterilisation at primary health centre. The majority (80.95%) of the cases reported to us with a pregnancy after 2 years of previous sterilisation. Majority of the patients (30.77%) came late in 2nd trimester and underwent 2nd trimester medical termination of pregnancy with resterilisation. Technical errors are the commonest cause of failure of female sterilisation in this study (84.6%) such as Technical errors in modified Pomeroy's method were:

- One tube not ligated
- Both the tubes not ligated
- Incomplete resection of the tube
- Tubal ligation done at fimbrial end.
- And Technical errors in laparoscopic methods were:
- Application of siliastic band to the other structures like round ligament or mesosalpinx
- Failure to apply siliastic band to one or both the tubes

The other causes were recanalisation (5.14%) and tuboperitoneal fistula (2%). We could not find out the cause of failure in 3 cases of ectopic pregnancy due to disturbed anatomy of the tube.

Conclusion

Now a days tubal sterilisation has been taken very casually. Sterilisations are routinely done by inexperienced junior surgeons. To make sterilisation surgeries a total success the failures can be prevented by the following: Proper training of the surgeons By proper selection of the cases in postmenstrual phase Adequate anaesthesia and adequate incision help visualisation and proper identification of both the tubes for ligation in minilaparotomy In laparoscopic method This is a prospective study of 42 cases of failure of female sterilisation carried out in this institution Swami Ramanand Teerth Rural Medical College and Hos by preventing the leakage of gases and arranging proper intensity of light in laparoscopic equipment by doing proper mobility of the uterus and adnexa for proper visualisation of tubes during laparoscopic procedures Ligature and bands should be applied at the proper site of the tube. Thus, the failures are less common if tubes are lifted at 3 to 4 cm from cornual end. Sterilisation surgery being one of the methods of National Population Control Programme should be done very carefully by senior surgeon or if done by the residents it must be under supervision of senior and experienced surgeons. Also proper care must be taken for identification of the fallopian tubes.

Many such failures can defame the National Family Planning Policy. In addition to teaching the residents in the teaching institution, refresher courses and special training of tubal sterilisation should be arranged for the doctors working at the periphery.

REFERENCES

1. Annunziata N., Zarcone R., Scotto di Telia L. et al A case of failure of tubal sterilisation using Pomeroy's technique Panmjnerva Med., 1997: 39(4): 315-6.
2. Arthur McCausland A high rate of ectopic pregnancy following laparoscopic tubal coagulation failures - Incidence and etiology Am. J. Obst. and Gynecol., 1980: 136: 97.
3. Cunningham FG, McDonald PC, Giant NF. In: William's Obstetrics, 18thedn. Connecticut, USA: Appletom and Lange,1989
4. De Villiers V. P. Failed postpartum sterilisation - A comparison offive methods S. Afr. Med. J., 1992: 82(5): 355 - 6.
5. Deepti Dongaonkar, SunitaMalhotra, LeelaKalamkar Evaluation of failed sterilization Ind. J. Obst.andGynec, 1991: 165-8.
6. Falfoul A., Friaar R, Chelli M. and Kharouf M. Pregnancy following female surgical sterilisation - Study approach of 38 cases J. Gynecol. Obst. Biol. Reprod.(Paris), 1993: 22(1): 23-5.
7. Gatzweiler R., Retzke U Tubal pregnancy after tubal sterilisation by bipolar electrocoagulation ZentralblGynakol, 1998: 120(3): 129-30
8. George R. Huggins, and Steven J. Sondheimer Complication of female sterilisation - immediate and delayed Fertil.Steril., 1984: 41: 337-353.
9. Gupta S., Dube S. Problems of laparoscopic tubal sterilization J. Obst. andGynec. Of India: 1993: 43: 281.
10. Herbert B. Paterson, Zhiacen Xia, Joyce M. Hughes, Lynne S. Wilcox et alThe risk ofpregnancy after tubal sterilisation - Findings from the US collaborative review of sterilization Am. J. Obstet. Gynec, 1996:174: 1161 - 70.
11. Herbert B. Paterson, Zhiacen Xia, Joyce M. Hughes, Lynne S. Wilcox et al The risk of ectopic pregnancy after tubal sterilization The New England Journal of Medicine, 1997: 13: 762 -767.
12. I. Cheng Chi, Leonard E. Lauff, Stephen D. Gardner, Marcia Tolbert An epidemiologic study of risk factors associated with pregnancy following female sterilization Am. J. Obst. and Gynecol., 1980: 136: 768.
13. Jens Jorgen Kjer and Lisbeth. B Knudsen Ectopic Pregnancy Subsequent to laparoscopic sterilization Am. J. Obst. and Gynecol., 1989: 160: 1202-4.
14. John A. Rock, John D. Thompson (eds).: Modified Pomeroy's method: TeLinde's Operative Gynecology, 8th edn., Lippincott - Raven, 1996: 534 – 6
15. Kurtadikar N. L, Sathe C. H. Evaluation of failed sterilization J. Obst. and Gynecol. India: 1984: 34: 287 - 290.

16. Louis H. Honore, Kathleen E Othera Failed tubal sterilisation as an etiologic factor in ectopic tubal pregnancy Fertil.SterH., 1978: 29: 509.
17. Makar A. P., Schatteman E. A. et al Female sterilisation failure after bipolar electrocoagulation - A six year retrospective study Europian J. Obstet. Gynaec. Reprod. Biol., 1990: 37(3): 237 - 46.
18. Mattingly R. F., Thompson J. D. (eds). In :Telinde's Operative Gynaecology, 6th edn. Philadelphia: JB Lippincott Co, 1985; 421.
19. Mondal G. S. and Day Failure of female sterilization National Journal of ObstetricandGynaecology, 1979: 29: 441.
20. Pravin V. Mehta A total of250136 laparoscopic sterilisations by single operator Br. J. Obstet. Gynaec, 1989: 96: 1024 - 34.
21. RakshaArora, Asmita M. Rathore, S. Habeebulah Failure of female sterilization Ind. J. Obst.andGynec, 1995: 645 - 648.
22. Ruminjo J. K. and Chabari C. Twice failed tubal ligation - A case report East Afr. Med. J., 1993: 70(8): 528 – 30
23. S. K. Chaudhuri Practice of fertility control4th edn: B. I. Churchill Livingstone Pvt. Ltd.: 1997: 179 -85.
24. S. S. Ratnam, K. BhaskerRao, S. Arulkumaran: Laparoscopic sterilization ObstetricandGynaecology for PostgraduatesVolume 1, Second Edition, Publisher Orient Longman,1996: 297-9.
25. SuwachaiIntarapresert, PansakSugkraroek, KamheangChaturachinda Failure of female sterilisation at Ramathibodi Hospital: A 20-year review (1969 -1988)J. Med. Assoc., 1993: 76: 31 - 34.
26. Tatum H. J. and Schmidt F. H.Contraceptive and sterilisationpractises and extrauterine pregnancy a realistic perspective. Fertil.Steril., 1977: 28: 407.
27. Veerbala N. Parikh Failure of sterilization J. Obst. andGynec. Of India: 1987: 37: 432

Source of Support: None Declared
Conflict of Interest: None Declared