SURVEY OF STERILIZATION FAILURES

by

SUNEETA MITTAL,* M.D.
SHEELA DUTT,** D.G.O.
and
SNEHLATA MISRA,*** M.D., D.G.O.

Introduction

With increasing population, sterilization as a method of family limitation is getting a wider acceptance all over the world. There is a definite increase in annual number of sterilizations done. In Lady Hardinge Hospital during the last 6 years (1974-79) 6472 female sterilizations were done. Maximum tubectomies were performed in 1976 during emergency. A decline was noted in 1977 following a change in government policy but the number is again increasing due to greater awareness for a small family norm.

Failure following tubectomy is rare. This survey has been conducted to analyse various factors responsible for failure of tubal sterilization.

Material and Methods

Total of 6472 tubectomy operations were performed at Lady Hardinge Hospital (now Smt. S.K. Hospital) during the years 1974-79. In all these cases modified Pomeroy's technique of tubal ligation was used and removed segment of the tube was subjected to histopathological examination. These tubectomies were either done as an isolated procedure in post-partum period or later as interval cases or performed in combination with medical termination of pregnancy, caesarean section or certain gynaecological operations.

Observations

Table I shows yearwise distribution of these cases. Maximum cases had puerperal sterilization-39.42% as post-partum cases and 11.60% along with caesarean section. A total of 18.12% cases had tubectomy along with medical termination of pregnancy, while 21.94% cases had it uncoupled as an interval procedure. Few cases were operated during gynaecological surgery like D&C, Manchester repair etc. or along with laparotomy being performed for some other pathology. Vaginal operative procedure was not carried out in this hospital after 1976 as a higher rate of complications was observed.

A retrospective study showed that out of these 6472 cases, total 14 cases reported with failure till August 1980, giving a total failure rate of 0.216%. It was assumed that all cases who conceived reported back to the same hospital. Case records of all these cases were analysed again and following facts were noted.

1. Failure rate in different years:

It is evident from Table I that by

*Senior Resident.
**Family Welfare Officer.
***Assistant Professor, Deptt. of Obstetrics and Gynaecology, Lady Hardinge Medical College and Smt. Sucheta Kriplani Hospital, New Delhi.

Accepted for publication on 24-12-80.

TABLE I
Distribution of Tubectomy Cases from 1974 to 1979

Methods	1974	1975	1976	1977	1978	1979	Total	Percentage
1. Post-partum	297	324	950	263	195	522	2551	39.42
2. With C.S.	99	112	154	96	108	182	751	11.60
3. With MTP								
-Suction Evacuation	129	130	302	52	65	178	856	13.23
-Hysterotomy	42	43	154	17	23	37	316	4.88
4. Interval Sterilization	—	92	1201	54	30	43	1420	21.94
5. With Gynae-Operations (D & C Manchester etc.)	11	27	265	75	11	20	349	5.39
6. With laparotomy (ectopic, perforations etc.)	18	18	21	24	14	16	111	1.71
7. Vaginal Sterilization	7	13	76	—	—	—	96	1.48
8. Post-abortal	—	4	11	1	—	6	22	0.33
Total	603	763	3134	522	446	1004	6472	100.00
Failures	1	1	10	2	0	0	14	
Percentage	0.166	0.131	0.319	0.383	—	—	0.216	

August, 1980, no patient had reported with failure out of those sterilized in 1978 and 1979, though cases may occur as follow-up period becomes longer. The largest number of failures were noted in cases operated in 1976 and 1977.

2. Age and Parity:

Patients were from 22 to 35 years of age with a mean age of 29.5 years. Parity ranged from 2 to 6 with a mean parity of 3.9. Age and parity had no correlation with sterilization failure.

3. Effect of coupling method:

Table II analyses failure in different types of sterilization. Failure rates were almost equal in post-partum cases and cases coupled with pregnancy termination and a little less when combined with D&C, while no failure was observed in cases undergoing sterilization along with

TABLE II
Failure Rate in Different Types of Sterilizations

Type	Total cases	Failures	Percentage
1. Post-partum	2551	9	0.353
2. With suction & evacuation	856	3	0.350
3. With hysterotomy	316	1	0.316
4. With D & C and other Gynaecological operations	349	1	0.286

laparotomy or caesarean section, or in those having a vaginal procedure.

4. Interval between delivery and sterilization:

This was analysed in all the 9 postpartum cases. Table III shows that

TABLE III
Interval Between Delivery and Sterilization Operation

Interval (Hrs.)	No. of cases	Percentage
<6	0	—
6-24	1	11.11
25-72	3	33.33
>72	5	55.56

55.56% of these 9 failures occurred in those cases operated after 3 days of delivery. No conception occurred in patients operated within 6 hours. Colonization of tubes after delivery may be an important factor responsible for this.

5. Other factors:

Out of 14 cases 2 were obese. No technical difficulties were encountered during operations. One patient had a previous caesarean scar, but adhesions were minimal with no difficulty during ligation of tubes.

6. Post operative sepsis

Significant pyrexia occurred in 40% cases, while overall sepsis rate of sterilization in this hospital is only 6%. Local stich sepsis occurred in 20% of cases; 6 out of 14 cases had uneventful post operative period.

7. Time lapse between sterilization and subsequent pregnancy:

Table IV shows that maximum number of failures occurred within 6 months. The earliest conception occurred in 2 months and by one year almost 60% had conceived. Subsequent failures were less and only 1 patient conceived after 3 years.

8. Period of gestation (POG) when pregnancy was diagnosed:

TABLE IV
Time Lapse Between Sterilization and Subsequent Pregnancy

Interval (months)	No. of cases	Percentage
<6	5	35.73
6-11	3	21.43
12-17	1	7.14
18-23	1	7.14
24-29	2	14.28
30-36	1	7.14
>36	1	7.14

Table V shows that despite sterilization

TABLE V
Period of Gestation at the Time of Pregnancy Diagnosis

Period of Gestation (Weeks)	No. of cases	Percentage
<6	3	21.43
6-12	9	64.29
>12	2	14.28

pregnancy was diagnosed after 12 weeks in only 2 cases. These patients did not suspect pregnancy at all and mistook amenorrhoea for menopause due to advancing age and attended hospital late. Rest of the cases reported early; 20% reporting while pregnancy was still less than 6 weeks.

9. Outcome of post sterilization pregnancy:

TABLE VI
Outcome of Pregnancy and Subsequent Contraception

Outcome:	No. of cases	Percentage
1. Ectopic	2	14.28
2. MTP	6	42.85
3. FTND	6	42.85
Contraception:		
1. Cut	3	21.43
2. Resterilization	8	57.13
3. Vasectomy	1	7.14

Following sterilization failure, 2 cases had ectopic pregnancy with an incidence of 14.28%. These cases had laparotomy and were resterilized. Twelve cases had intrauterine pregnancy. Out of these, 6 had medical termination of pregnancy with resterilization in 3 cases and CuT insertion in the rest. Six patients had full term normal deliveries as they were either happy being pregnant due to loss of earlier children in 2 cases or were too disgusted with M.T.P. as earlier sterilization was performed along with MTP. One of these cases had had hysterotomy earlier. Three of these patients underwent puerperal resterilization and in 1 case the husband underwent vasectomy. Remaining two did not agree for any contraception and did not turn up for further follow up. One of the CuT insertions conceived again with CuT in situ, thus had a repeat MTP and her husband underwent vasectomy.

Discussion

The Pomeroy's technique of tubal ligation is most widely used and simplest to perform. It is an effective method, the failure rate varying from person to person. Murdock (1969) reported highest combined failure rate of 2.0%, while Garb (1957) by a comprehensive study quoted a failure rate of 0.4% and 1.4% respectively with Pomeroy's and Medlener's method. Thompson and Wheeless (1975) observed a gradual decline in the overall failure rate, being 1.7% in earliest years as compered to only 0.25% in later years. Hughes (1977) also noted a similar decline from 0.7% in 1967 to only 0.13% in 1977. In this study overall failure rate over a period of 6 years was 0.216%. Menon *et al* (1980) have quoted a failure rate of only 0.1%.

Various factors affect the reliability of operation. Pelvic infection may be an important cause resulting in morbidity as well as subsequent failure as reported by Murdock (1969). A high failure rate was noted by him when operation was performed during caesarean section (C.S.) or hysterotomy. Hughes (1977) and Prystowsky and Eastman (1955) noted the operation to be less reliable when performed with MTP or C.S. (..) Guanan and Courey (1974) held the opposite view. Husbands *et al* (1970) also observed a low incidence with C.S. (..). Hernandez (1975) observed a higher incidence of failure in patients having vaginal procedure or in cases operated in puerperium or in association with therapeutic abortion, while an extremly low incidence was observed when ligation was performed in combination with laparotomy for gynaecological operations. In the present series, (Table II), the incidence of failure in post-partum and MTP cases was equal and was more than in tubectomies performed with gynaecological D & Cs. Probably laxed pregnant state of tissues may have an important role, as no failures have occurred in interval cases. None conceived after tubectomy done with C.S. as was also observed by White (1966).

Other important factors observed by Hughes (1977) influencing the failure rate were technical difficulties encountered, experience of operator and surgical errors. In few of his cases one or both tubes were found normal at subsequent operation. In our series, in all 8 cases having resterilization (including 2 ectopics) the tubes showed evidence of previous ligation and division. Recanalization of lumen (Murdock, 1969), epithelial lining of fibrous cord (Garb, 1957) or formation of tubo-peritoneal fistulae are noted to be important causes of failure.

Dieckmann and Hauser (1948) report-

ed earliest conception within 2 months of tubectomy and maximum interval was 39 months. Cheng *et al* (1977) by a survey in Singapore observed a peak failure rate at 3-6 months with a gradual decline as interval increased. Only 2 out of 51 pregnancies occurred after 2 years. Thompson and Wheeless (1975) also reported 71.9% conceptions in 2-5 months, while only 6.2% conceived after 20 or more months. Same has been observed in our series. Maximum conceptions occurred within first 6 months (35.73%) while only 7.14% conceived after 3 years.

Ectopic tubal pregnancy rate after sterilization is reported to be varying from 12-30% (Chakravarti *et al*, 1975). In this survey it was found to be 14.28%. Tatum and Schmidt (1977) reported an ectopic pregnancy rate of 16.57% in 332 sterilization failures, while Cheng *et al* (1977) quoted a rate of 15.68%.

Conclusion

A total of 0.216% cases conceived after tubal ligation by Pomeroy's technique. Failure rate was higher in post-partum cases (0.353%) and in those associated with medical termination of pregnancy by suction evacuation (0.350%). In post-partum cases failure increased with increasing operation delivery interval. Maximum cases conceived within first 6 months of tubectomy, the rate declining thereafter. Infection was an important factor. Most pregnancies were diagnosed in less than 12 weeks, only 14.28% being diagnosed later. Subsequent contraception was practised by 85.72%.

Acknowledgement

The authors are grateful to Dr. S. Chawla, M.D., D.M.R.D., F.A.M.S., Principal and Medical Superintendent and Dr. Y. Pinto da Rosario, M.D., Professor and Head of the Department of Obstetrics and Gynaecology, Lady Hardinge Medical College and Smt. Sucheta Kriplani Hospital, New Delhi, for giving permission to publish this paper.

References

1. Chakravarti, S. and Shardlow, J.: Brit. J. Obstet. Gynaec. 82: 58, 1975.
2. Cheng, M. C. E., Wong, Y. M., Rochat, R. W. and Ratnam, S. S.: Stud. Fam. Plann, 8: 109, 1977.
3. Dieckmann, W. J. and Hauser, E. B.: J. Obstet. Gynec. 55: 308, 1948.
4. Garb, A. E.: Obstet. Gynec. Survey, 12: 291, 1957.
5. Guanan, Jun., R. G. and Courey, N. G.: J. of Reprod. Med. 13: 204, 1974.
6. Harnandez, F. J.: Fertil. Steril. 26: 393, 1975.
7. Hughes, G. J.: Brit. Med. Jour. 2: 1337, 1977.
8. Husbands, M. E., Pritehard, J. A. and Pritchard, S. A.: Am. J. Obstet. Gynec. 107: 966, 1970.
9. Menon, M. K., Devi, P. K. and Bhasker, Rao, K. P. G.: Obstet. and Gynec. edited by Krishna Menon, M. K.; ed. I, Published by Orient Longman Ltd., p. 384, 1980.
10. Murdock, R.: J. Obstet. Gynec. Brit. C'wealth. 76: 1043, 1969.
11. Prystowsky, H. and Eastman, N. J: J. Am. Med. Assoc. 158: 463, 1955.
12. Tatum, H. J. and Schmidt, F. H.: Fertil. Steril. 28: 407, 1977.
13. Thompson, B. H. anl Wheeless, C. R.: Obstet. Gynec. 45: 659, 1975.
14. White, C. A.: Am. J. Obstet. Gynec. 95: 31, 1966.