

International Journal of Medical Science and Innovative Research (IJMSIR) IJMSIR : A Medical Publication Hub Available Online at: www.ijmsir.com

Volume – 2, Issue – 4, July - August - 2017, Page No. : 217 - 223

Female Sterilisation Failure: Review over a Decade and Its Clinicopathological Correlation

Dr. T.S. Meena, MD.DGO Dr. K.S. Ramya*, MS.DGO, Mr. R. Mothilal MA.DPS

Department of Family Welfare, Government Kilpauk Medical College Hospital, Chennai-10

Correspondence Author: Dr. K.S. Ramya*, M.S. DGO, Department of Family Welfare, Government Kilpauk Medical College Hospital, Chennai-10, India.

Conflicts of Interest: Nil

Abstract

Objectives: The primary objective of the following study is to determine the demographic patterns of women presenting as sterilization failure and secondary is to evaluate etiological factors for failure and lay standard guidelines to reduce failure rate.

Materials and Methods: The present study is retrospective study conducted in the Department of Obstetrics and Gynaecology, Postpartum Centre, Family Welfare Division, Government Kilpauk Medical College Hospital over a decade (April 2007 – March 2017). Study cases of post sterilisation failure were done from hospital records.

Results: Over a decade, 134 cases of sterilization-failure with longest interval of 16 years have been documented. 56 (41.8%) cases were pupheral sterilisation (PS) and 48 (35.8%) were lower segment caesarean section 18 (13.4%) cases were of mini laparotomy (Minilap/TAT) and 12 (9%) laparoscopic tubal ligation. In 75 cases (56.0%) sterilisation were performed in medical college hospital (MCH). Only 105 (78.4%) patients reported failure in 1st trimester (<12 weeks). 63 cases (47%) were of ectopic pregnancy. There were 71 cases (53%) of spontaneous re-canalization. In 4 cases (3%) failure was due to improper surgical procedure.

Conclusion: Female sterilization even though considered as permanent method of contraception, spontaneous recanalization is possible even 16 years after procedure.

Maximum cases of failure were postpartum sterilisation and those were performed at medical college hospital. The most common cause of failure was spontaneous recanalisation. Ectopic pregnancies were seen in 47 % of cases. Proper counselling of patient is must. There is a need to stick to standards of sterilization procedure to prevent future failure.

Keywords: Laparoscopic tubal ligation, minilaparotomy, spontaneous tubal recanalization, sterilization-failure, tubal ligation, tubal sterilization.

Introduction

Female sterilization or tubal ligation is the most accepted method of contraception in India. Almost 4-5 million sterilization procedures are performed annually contributing to 98% of all sterilizations and roughly 62% of all contraceptive use. The most popular method used in India is the laparoscopic tubal occlusion [1]. Over 85.3% of all persons who have adopted this method of contraception availed this service from government facilities [1]. The most popular method used in female sterilization in Tamil Nadu is (82%) postpartum sterilisation. Although, tubal sterilization is considered a permanent method of fertility control, pregnancy can occur in 1 in 200, according to international sources [1]. In the 1st year after tubal sterilization, the estimated failure rate is 0.1 - 0.8% respectively [1]. In our study, we have tried to evaluate the etiological factors for sterilizationfailure and also to discuss preventive measures to avoid

Corresponding Author: Dr. K.S. Ramya, Volume - 2 Issue - 4, Page No. 217 - 223

unwanted pregnancies and maternal morbidities as a result of sterilization-failure especially in developing countries like India where sterilization-failure is a genuine medical issue.

Materials and Methods

This study is a retrospective study which includes all women who have reported or referred as tubalsterilization-failure to Department of Obstetrics and Gynaecology, Postpartum centre, Family Welfare Division, Government Kilpauk Medical College and Hospital, Chennai-10 during the period of 10 years from April 2007 to March 2017. Information has been collected from hospitals records of these patients maintained in the institution. Informed consent form was not needed as identity of patient has not been revealed anywhere. Important aspects of case history includes age, obstetric score, type of sterilisation, place of sterilization, sterilization-failure interval, gestational age at the time of decision of couple regarding diagnosis, further management of present pregnancy and re-sterilization. Pregnancy was further managed depending on couple's decision, gestational age, obstetric history and maternal condition. Those patients who were not ready or fit for resterilisation were discharged. During the re-sterilisation, previous sterilization procedure was assessed for correct performance, re-canalization, intactness and other associated findings. Re-sterilization was performed depending on their intra-operative findings.

30 25 20 15 10 5 0 2009-10 2007-08 2015-16 2008-09 2011-12 2012-13 2013-14 2014-15 2016-17 2010-11

Figure 1: Year wise distribution cases

Women of age group 25-29 years (42.5%) contributed the largest group [Figure 2]. The eldest patient documented was 40 years. In parity comparison, 65.7% of women were para2 and 28.4% of women were para3 [Figure 3]. We have also reported a patient with parity 6 who had conceived after sterilisation. In living children comparison, 72.4% of women were two children. When we compared type of surgery [Figure 4], postpartum sterilisation failure constituted 77.6 % (PS 41.8% and LSCS 35.8%) followed by MINILAP / TAT - 13.4% and laparoscopic tubal ligation – 9%. Six Elective LSCS with Sterilization-failure sterilisation done was noticed. interval [Figure 5] was <1 year in 8 (6%) cases. 1-5 years in 79 patients (59%), 6-10 years in 35 (26.1%) and > 10years in twelve patients (9%). The longest documented sterilisation-failure interval was 16 years in two patients in our study presented with ectopic pregnancy and tubal abortion respectively.

Results

During the selected period April 2007 – March 2017 (10 years) 134 women have reported to the institution as tubal sterilisation-failure making an average of 13.4 cases / year. Year-wise distribution is projected in Figure 1.



Figure 2: Age wise distribution of cases











Figure 5: Sterilization-failure Interval

In whom sterilization failure interval was < 1 year; initial non-occlusion due to improper procedure was responsible for failure in two of 8 cases (25%). Similarly, 4 (50%) recanalization and an ectopic was two (25%). Interval of 1-5 years was in 79 patients (59%) with recanalization in 42 cases (53.2%), ectopic in 37(46.8%).

When we compared patients in sterilization-failure interval 6-10 years, recanalization was seen in 15 cases (42.9%), ectopic in 20 cases (57.1%). That patient in which sterilization-failure interval was > 10 years, ectopic was found in 6 cases (46.2%), recanalization in 6 cases (53.8%).

When place of previous sterilization was compared [Figure 6], 75 cases (56.8%) were tertiary centre followed by Chennai corporation hospitals 21 (15.9%), government hospital 16 (12.1%), government primary health centre (PHC) 14 (10.6%) and private hospital 6 (4.6%) in descending order. 2 cases could not be evaluated.

The proportion of failure in 1^{st} trimester, 2^{nd} trimester and 3^{rd} trimesters and their final management are indicated that only 105 patients (78.4%) reported failure in 1^{st} trimester, out of 62 (46.3%) underwent laparotomy for an ectopic pregnancy and one inserted with Cu T (0.8%), 40

Page Z

(29.9%) underwent 1st trimester medical termination of pregnancy (MTP), one required LSCS (0.7%) and one ITAT (0.7%). There were 15 patients with gestational age of 12-20 weeks (11.2%), 4 (3.0%) had 2nd trimester MTP, 5 (3.7%) were required LSCS and 3 (2.2%) was delivered vaginally, two (1.5%) underwent hysterectomy and one ITAT (0.8%). In rest 14 patients where pregnancy was >20 weeks (10.4%), 6 delivered vaginally at term (4.4%) and 8 required LSCS (6.0%) as demonstrated in Figure 7.







Figure 7: Final Management

To summarize, recanalization was seen in 134 cases along with 63 cases (47%) of ectopic pregnancies. Recanalization was documented on the right side in 68, on the left side in 66 patients as given in Figure 8. Details regarding improper procedures are described in Table 1. Methods performed during re-sterilization were specified in Table 2 along with incidental findings enumerated in Table 3.



Figure 8: Etiologic of failure

In comparison related to type of 1^{st} sterilization, recanalisation was distributed, 56 cases (41.8%) with Puerperal sterilisation, 42 cases with emergency LSCS (31.3%), 6 cases with elective LSCS (4.5%), 5 cases with Laproscopic (3.7%), 7 cases with MTP LAP (5.2%), 10 cases with TAT (7.5%), 7 cases with MTP TAT (5.2%) and the rest one case was salphingo Ooperectomy with left tubectomy (0.7%). When recanalisation was distributed, 55 cases with postpartum sterilisation, 8 cases with Laparoscopic and 8 cases with Mini Lap / TAT as given in Chart. Similarly, ectopic pregnancies were plotted as 49 cases with postpartum sterilisation, 10 cases with mini lap / TAT, 4 cases with Lap. There were four improper procedures noticed with 1 Lap, 2 MTP Lap and one MTP TAT.

Discussion

Chances of failure are more in younger age as almost 64.1% failures documented were < 30 years which correlates with previous study of Shilpa Vishwas Date et al., Trusssel et al and Peterson et al [1,2,3].

In our study, failure with postpartum sterilisation was more (77.6%) compared to minilap/TAT(13.4%) and Lap(9%) as contrary to Kulier et al where there was no significant difference in failure rate between minilap and Lap Hughees who described higher failure rate with Lap [4,5].

Failure interval was between 1 and 10 years in 85.1% of patients which almost coincides with Vessey et al and Lassner et at [6,8]. The longest documented failure interval was 23 years [9] Whereas in our study it was reported to be 16 years.

A proportion (0.25) of early failures (<1 year) were mainly due to initial non-occlusion of tube due to improper procedure compared with late failures where tubal regeneration leading to spontaneous tubal reapproximation associated with tubal reanastomosis and recanalisation were likely factors similar to study of Varma and Gupta [10]. When failure due to improper procedure was further analysed 67% contribution was from occlusive methods with Laparoscopy. In resectional methods with minilap, failure was prominently due to spontaneous luminal regeneration. Both findings were comparable with Soderstrom[11].

There is an evidence that anatomical tubal patency can occur following a correctly undertaken sterilisation methods [12-15]. However, persisting anatomical tubal patency does not necessarily imply sterilization failure, as tubal patency rates of 1-2% at 3 months and 16% at 5 years have been noted following correctly applied tubal ligation, with the actual pregnancy occurrence of 1-2% over this time period [11].

When place of previous surgery was evaluated, 10.6% cases were from PHC. This could be explained with Hughes, Roy et al and Stovall et al studies [5,16,17] mentioning that untrained surgeons being constant factor in sterilization-failures. According to study carried out by Premalatha and Tripathi standards of sterilization were followed in < 17% of patients [18].

Pre-existing gynaecological pathology or mullerian anomalies were documented as predisposing factors for sterilization-failure [19,20] which were also seen in few of our cases narrated in detail in incidental findings [Table 3].

Ectopic pregnancies constituted 3% and 27.6% in < 1% and 1-5 year group similar to Shah et al and Bhatnagar [21,22] but for higher intervals it had contributed up to 19.4% comparable to Varma and Gupta[10]. These findings can be correlated in simpler terms as initial nonocclusion leading to early failure and as it is likely to damage the tube, resulting pregnancy is likely to be intrauterine whereas late failures developing due to spontaneous tubal regeneration resulting abnormal luminal anatomy increasing chances of ectopic pregnancy. This can also explain how 8.2% ectopic were due to minilap failure.

Almost 21.6% cases were reported when pregnancy was > 12 weeks and out of 51.7% required major surgical interventions such as hysterotomy(6.9%), LSCS (44.8%) for re-canalization. 11.1% patients underwent 2^{nd} trimester MTP, 3.7% patients underwent interval TAT and the rest 33.3% patients gave birth vaginally and resterilisation done.

Guidelines are given in standards for female sterilisation services, ministry of health and Family Welfare, Government of India, 2014 November. They are as follows. The operating surgeon should identify each fallopian tube clearly, following it right up to the fimbria. Excision / Occlusion of 1 cm of fallopian tube should be done. The site of the occlusion of the fallopian tube must always be within 2-3 cm away from uteine cornu in the isthmal portion.

Conclusion

Female sterilization-failure is well known and proven entity and no age, method and interval is failure free. Although, it is not completely preventable, failure due to improper procedure can be avoided if we will follow standard guidelines for tubal ligation. Proper counselling

of patient regarding chances of failure and early reporting if menses are delayed can help in diagnosing failure in early gestation and to reduce related morbidities and mortalities.

References

[1]. Shilpa Vishwas Date, Jyoti Rokade, Vidya Mule, Shreedher Dandapannavar. Female sterilization failure: Review over a decade and its clinicopathological correlation. Int J App Basic Med Res 2014; 4:81-5.

[2]. Tussill J, Guilbert E, Hedley A. Sterilization failure, sterilization reversal, and pregnancy after sterilization reversal in Quebec. Obstet Gynecol 2003;101:677-84.

[3]. Peterson HB, Xia Z, Hughes JM, Wilcox LS, Tylor LR, Trussell J. The risk of pregnancy after tubal sterilization: Findings from the U.S. Collaborative review of sterilization. Am J Obstet Gynecol 1996;174:1161-8.

[4]. Kulier R, Boulvain M, Walker D, Candolle G, Campana A. Minilaparotomy and endoscopic techiniques for tubal sterilization. Cochrane Database Syst Rev 2004 (3):CD001328.

[5]. Hughes GJ. Sterilization failure. Br Med J 1977; 2:1337-9.

[6]. Vessey M, Huggins G, Lawless M, McPherson K, Yeates D. Tubal sterilization: Findings in a large prospective study. Br J Obstet Gynaecol 1983;90:203-9.

[7]. Bollapragada SS, Bandyopadhyay S, Serle E, Baird C.Spontaneous pregnancy after bilateral salpingectomy.Fertil Steril 2005;83:767-8.

[8]. Lassner KJ, Chen CH, Oberle MW, da Trindade TC, Aguinaga H. Analysis of sterilisation failure in Brazil. Int J Gynaecol Obstet 1988;27:255-63.

[9]. Huddleston HT, Dunnihoo DR. Long-term sterilization failure: Twenty-three years. J La State Med Soc 2000;152:427-8.

[10]. Varma R, Gupta JK. Failed steriization: Evidencebased review and medico-legal ramifications. BJOG 2004;111:1322-32.

[11]. Soderstrom RM. Sterilization failures and their causes. Am J Obstet Gynecol 1985;152:395-403.

[12]. Grunert GM. Late tubal patency following tubal ligation. Fertil Steril 1981;35:406-8.

[13]. Stock RJ. Histopathologic changes in fallopian tubes subsequent to procedures. Int J Gynecol Pathol 1983;2:13-27.

[14]. Ayers JW, Johnson RS, Ansbacher R, Menon M, LaFerla JJ, Roberts JA. Sterilization failures with bipolar tubal cautery. Fertil Steril 1984;42:526-30.

[15]. Cook CL. Evaluation of Falope Ring sterilization by hysterosalpingogram. J Reprod Med 1982;27:243-5.

[16]. Roy KK, Banerjee N, Takkar D. Pregnancy following tubal sterilization:An 11-year survey. Int J Gynaecol Obstet 2000;68:53-4.

[17]. Stovall TG, Ling FW, Henry GM, Ryan GM Jr. Method failures of laparoscopic tubal sterilization in a residency training programm. A comparison of the tubal ring and spring-loaded clip. J Reprod Med 1991;36:283-6.

[18]. Premalatha R, Tripathi MS. A study on the reversal of sterilization in women over two decades. J Obstet Gynaecol India 2012;62:62-7.

[19]. Sharma D, Singhal SR, Singhal SK. Uterus didelphys, a rare cause for tubal sterilization failure. Aust N Z J Obstet Gynaecol 1988;38:327-8.

[20]. McCausland A. Endosalpingosis("endosalpingoblastosis") following laparoscopic tubalcoagulation as an etiologic factor of ectopic pregnancy.Am J Obstet Gynecol 1982;143:12-24.

[21]. Shah JP, Parulekar SV, Hindura IN. Ectopic pregnancy after tubal sterilization. J Postgrad Med 1991:37:17-20.

[22]. Bhatnagar S. Risk of ectopic pregnancy following tubectomy. Indian J Med Res 1982;75:47-9.

Table 1 Improper procedure details

Improper procedure	Number
Tubal ligation not performed on	1
right side	
Tubal ligation not performed on	
left side	
Band placed at right mesosalpinx	
or round ligament	
Band placed at left mesosalpinx	1
or round ligament	
Bands at mesosalpinx on both	
sides	
Slippage of ring in mesoalpinx	2
Left tube / right tube	
Right side band at mesosalpinx +	
no band on left side	

Table 2: Re-sterilization procedure details

Re-sterilization procedure	Number of patients
1.Right fimbriectomy	3
2.Bilateral fimbriectomy	3
3.Bilateral salpingectomy	4
4.Right salpingo-oophorectomy	1
5.Left salpingo-oophorectomy	3
6.Left partial salpingectomy	3
7.Right partial salpingectomy	7
8.Right salpingectomy	32
9.Left salpingectomy	36
10.re-st not done mtp with Cu T	1
11.Hysterectomy with re-stern	1
12.MTP with re-sterilisation	20
13.LSCS	8
14.PS with re-ster	5
15.interval TAT	2
16. ectopic re-ster	5

Table 3: Incidental findings

Incidental findings	Number of patients
Left hydosalpinx	
Right hydosalpinx	
Left tubo-ovarian mass	

Right tubo-ovarian mass	
Bicornuate uterus	
Left hematosalpinx	
Dense adhesions	2

Page 2