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Fertility Outcomes after Tubal Recanalisation - A Prospective Study.

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ABSTRACT

Background: To study the fertility outcome after tubal recanalisation done for sterilisation reversal and various factors affecting successful recanalisation. **Methods:** It is a perspective study of 30 cases who undergone tubal recanalisation for reversal of sterilisation in SCB Medical and hospital, Cuttack from October 2015-october 2017. **Result:** Loss of child was the commonest reason for seeking reversal of sterilisation. Out of 30 patients, the conception rate was 19(63.3%), 18 were intrauterine, one was ectopic, 15 live birth, 1 aborted and 2 are ongoing pregnancies. The conception rate was high when the age of the patient was less than thirty years (78.8%), interval between sterilisation and its reversal was less than 4 years (83.3%), when it was following laparoscopic sterilisation (68.4%), when the site of anastomosis was isthmo-isthmic (63.1%) and when the remaining tubal length was more than 6 cm (83.3%). **Conclusion:** Recanalization procedure being simple and effective method in respect to IVF is increasing in demand for sterilisation reversal. Successful fertility outcome after tubal recanalisation depends on age of the patient.type of previous sterilisation,site of sterilisation and anastomosis and final length after tubal recalisation. During sterilisation gynaecologist should remember laproscopic sterisation is preferred and site of occlusion is isthmus so that every sterilised women can undergo recanalization operation if circumstances arises later in life.

Keywords: Pregnancy rate, sterilisation reversal, tubal recanalization.

INTRODUCTION

Tubal sterilisation is currently the most popular form of birth control. According to NFHS-4(2015-16) female sterilisation is 37.3% of all methods of family planning.[1] Sterilisation is intended as a permanent procedure, yet many women experience regret at a later date, feels pain when some unforeseen circum¬stances come. They desire to have child again. Requests for reversal of the procedure (re-canalization) are not infrequent 1% to 5%. There are various techniques of making them fertile again, one of which is tubal recanalization.

Recanalisations done by microsurgical techniques offer a pregnancy rate superior to that achieved with traditional surgical techniques .Use of a microscope or loupes are used for magnification during open surgery. Several factors like the age of the women, type of tubectomy done, duration since tubectomy and technique of recanalisation have been considered to influence the outcome of recanalisation. The present study was undertaken to study the factors which may be associated with successful outcome following tubal recanalization.

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Aims and objectives

- To study the fertility outcome after recanalization procedure for reversal of sterilisation.
- To analyse the factors affecting successful recanalization and also affecting pregnancy outcome after a successful recanalization

MATERIALS AND METHODS

This study is being carried out at Department of Obstetrics and Gynaecology,SCB MCH ,Cuttack,Odisha(a tertiary care centre).The patients are referred to this centre from the all districts and adjoining states.It was a porspective study comprises of 30 patient who underwent recanalisation for sterilisation reversal and followed up for fertility outcome during the period October 2015-October 2017.

Inclusion criteria

Age less than or equal to 39 years, willing to participate in the study and would be available for regular follow up.

Exclusion criteria

Women aged above 39 years, Women with ovulatory disturbances,obvious pelvic inflammatory disease, endometriosis or fibroid as a cause of infertility .Women with any contraindications to pregnancy or surgery and if she was not willing to participate in the study.

Methodology

A detailed history was elicited focusing on details of sterilization, including the age at the time of sterilization ,parity at the time of sterilization, type of sterilization, interval between sterilization and reversal and reason for reversal of sterilizations. Menstrual history was recorded. Obstetrics history including parity and the cause for death of child was recorded.

A thorough clinical examination was done followed by routine laboratory evaluation.Semen analysis of the husband was done; patients were hospitalized and after obtaining the informed written consent, recanalisation was done, as per the protocol

Procedure

Tubal recanalisation was carried out in the postmenstrual phase. Under magnification with magnifying lens fitted to spectacle or loupe,the tube grasped with Babcock's forceps, freed from adhesions.Holding with adsons micro forcep,occluded portion cut with iris scissor [Figure 1]. An epidural catheter was passed through fimbriated portion of the tube to cofirm patency of the tube and act as a stent. An anchor stich was given through mesosalpinx by 5-0 vicryl to ensure both tubal stumps brought together.Anastomsis of muscularies was done by means of 6-0 prolene suture [Figure 2]. First bite was taken at 6.0 clock position that is mesenteric border and later 3,9,12 o clock position. Serosa was approximated similarly. During whole procedure normal saline was put for preventing dehydration of the structures.Patency of both ends was established by direct tube testing by injecting methylene blue dye [Figure 3].

The parameters studied were condition of the tubes, ovaries, uterus, type of tubectomy, anatomical site of anastomosis, final length of the reconstruction tube.

Women were followed for a period of at least 6 month and event like pregnancy, ectopic pregnancy, pelvic infection were recorded. If there was no conception within the follow up period hysteroslapingogram was done to check for tubal patency.

Statistical Methods:

Descriptive and inferential statistical analysis are used. Results on continuous measurements are presented on Mean±SD and number (%).Results on categorical measurements are presented in Number (%). For comparison of continuous variable independent sample t test was used. Chi-square/ Fisher Exact test has been used to find the significance of study parameters on categorical scale between two or more groups.

Significance is assessed at 5 % level of significance(p value<0.05).

Plan for data analysis

All data collected entered into a profroma ,put in EXCEL spread sheet and was analysed by using SPSS (statistical, package for social science).

RESULTS

By october 2017, all these 30 women had been followed up for at least 6 months.Pregnancy was noted in 19 cases (63.3%).Out of these there were 15 live birth,1 ectopic pregnancy, 1 abortion and 2 ongoing pregnancies.[Graph 1]

56.7% women are within age group 25-29 years, 43.3% women are between 30-38 years. Among total conceived person 78.8% are in age group 25-29 years, mean age being 28.52 years. [Table 1].

Laparoscopic sterilization was the sterilization method in 66.7% women and 33.7% had undergone sterilization by pomroy technique. Death of one or all children was the commonest reason for seeking reversal (76.7%) followed by desire of more child. Most of the women came after 4 years of sterilization (60%) but maximum number of conceived women came within 4 years (52.6%) In non-conceived group interval more than 4 years is statistically significant with p value <.001.So decrease chance of conception with increase interval [Table 2].

Condition of tube ovaries was found to be normal in 73.3% cases.Any abnormality was found to be associated with nonconceived group.[Graph 2]

Most common site of anastomosis performed was isthmo-isthmic(55%) followed by isthmo ampullary and then ampulo-ampullary. Among conceived patients 63.1% had b/l isthmo-isthmic type of anastomosis which is significant with p value 0.04 [Table 3 & Graph 3].

Table 1: Age distribution.

Age in years	Conceived		Not conceived		Total	P value
	No	%	No	%		.005
25-29	15	78.8	2	18.2	17	
30-34	2	10.6	5	45.5	7	
35-39	2	10.6	4	36.3	6	
Total	19	100.0	11	100.0	30	

Table 2: Interval from Sterlisation.

Interval from Sterlisation	Conceived		Not conceived		Total patients	P value
	No.	%	No.	%		.001
<4 years	10	52.6	2	18.2	12	
4-6 years	7	36.8	7	63.6	14	
>6 years	2	10.6	2	18.2	4	
Total	19	100.0	11	100.0		

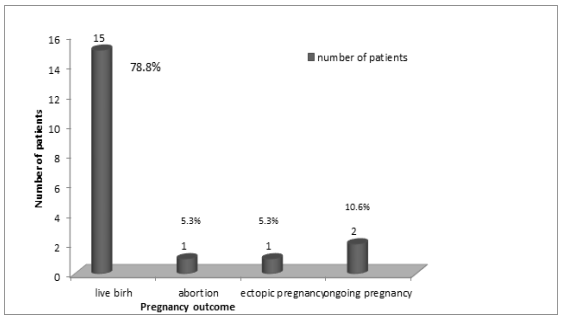
After recanalisation 60% of tubes had final length more than 6 cm. Conception noted when tube length was atleast 6 cm and 83.3% women conceived when tube length was more than 6 cm. No women conceived when tube length is less than 4 cm [Table 4]. Mean interval from recanalization to conception was 5.63(SD-3.09) months. Among total conceived patienrts 94% conceived within one year, out of which 73.3% resulted in live birth .Majority patients (52.6%) conceived within 4 month of recanalization. Out of 11 nonconceived patient 9 did HSG. Bilateral tubal patency was established in 55.6% cases; unilateral tubal patency was seen in33.3% and bilateral tubal block in 11.1%.

Table 3: Site of anastomosis

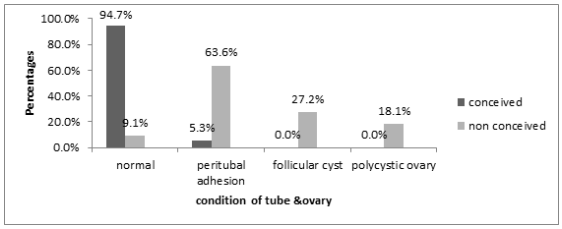
Anastomosis	Conceived		Not conceived		Total	P value
	No	%	No	%		0.04
B/L isthmo-isthmic	12	63.1	2	18.2	14	
B/L ampullo-ampullary	2	10.6	3	27.2	5	
Isthmoishmic +isthmoampullary	4	21	1	9.1	5	
B/L isthmo-ampullary	1	5.3	2	18.2	3	
B/L infundibulo-ampullary	0	0	2	18.2	2	
Isthmoampullary +cornu isthmic	0	0	1	9.1	1	
Total	19	100	11	100	30	

Table 4: Final Length of reconstructed tubes.

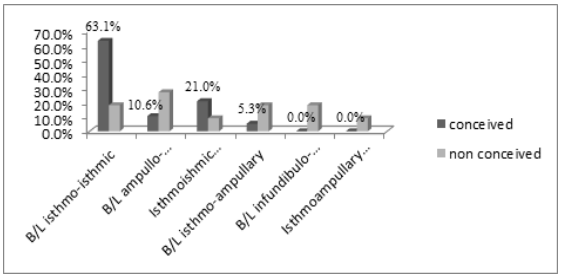
Final Length of Reconstructed Tube	Total No. of patients	Conceived No	Percentage	P value
<4 cm	**3**	**0**	**0**	**0.008**
4 – 6 cm	9	4	44.4	
7-9 cm	18	15	83.3	
Total	30	19		



Graph 1: Pregnancy outcomes.



Graph 2: conditions of tube and ovaries.



Graph 3: Site of Anastomosis.

Figure 1: Sterilisation site cut and freshened.

Figure 2: Recanalisation being done.

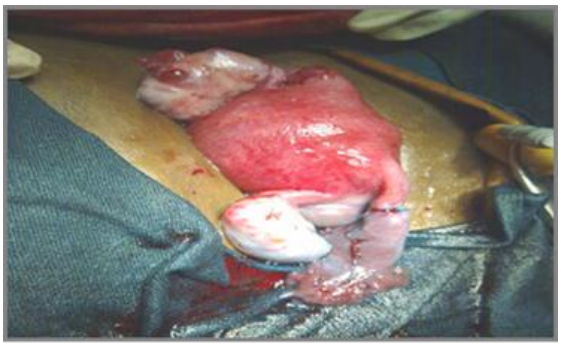


Figure 3: Methylene blue dye test after recanalisation to check patency

DISCUSSION

Different characteristics of the patients and factors affecting fertility outcome.

1. **Age**

In our study majority of women who underwent recanalization are in age group 25-29 years(56.7%), which is similar to study done by Biswas and Mandal, where it is 50.8%.[6] In study done by Maya et al majority of women are in group 31-35 years.[8] With increasing age fertility potential decreases and chance of genetic abnormalities and complications of pregnancy increases. In our study conception rate was maximum in age group 25-29 years (78.8%) and it decreases with age. No pregnancy after 37 years.[9] Jain et al showed a higher pregnancy rate (75%) below age 25 years.[10]

2. **Mehod of sterilisation**

In the present study laparoscopic steilization by falopes ring was most common method(66.7%).Biswas and Mondal (2006) found that 59.65% of women had previous laparoscopic sterilisation which coincides with the study by Desai et al (1998) where 63.2% of women had previous laparoscopic sterilisation. The sterilization procedure affect the outcome. As in pomroy method long segments of tube removed and in laparoscopic method minimal tissue damaged. The present study showed a success rate of 68.4% in women who had undergone laparoscopic sterilisation as compared to 31.6% in women following reversal of Pomeroy's technique. In study by jaykrisnan et al it was found pregnancy rate was higher following laparoscopic serilization by falopes ring 85.7% as compared to pomroy procedure (40%).

3. **Reason for reversal**

In the present study, death of one or all children was the commonest reason for couple to seek reversal of sterilisation (76.7%). In the study by jaykrishnan et al the most common reason for seeking reversal was death or disability of child(72%) followed by second marriage (28%).[14] A study by Mukherjee et al (2000) showed that death of all children was the commonest reason for reversal of sterilisation (91.8%).

4. **Interval from sterilization to reversal**

In the present study 60% of women had come after 4 years of sterilization.It was found that out of 12 patients coming within 4 years, pregnancy noted in 10 (83.3%) mean age being 4 years, whereas there was 50 % pregnancy noted among women coming after 4 years. Among conceived group 52.6% had been undergone sterilization <4 years age.Biswas and Mondal (2006) showed in their study that 50% of women came for sterilisation reversal within 3 years of sterilisation. Kalaichelvi et al (2001) found that 87% of women conceived when recanalisation was done within one year of sterilisation while the incidence dropped to 16% when the interval was more than ten years.[4]

5. **Site of anastomosis**

As after excising damaged tube, remaining healthy tube segments are recanalized, hence the site of recanalisation is an important factor in determining the results of tubectomy reversal. In the present study the commonest site of anastomosis was isthmo- isthmic (55 %), followed by isthmo-ampullary (20 %) and the least was cornu ampullary (1.6%), which coincides with studies by Brar et al (2000) and Biswas and Mondal (2006) where the commonest type of anastomosis was isthmo-isthmic in 48% and 49.1 % respectively In the present study, Out of total conceived patients 63.1% patients had bilateral isthmo-isthmus anasomosis. Bilateral isthmo-isthmic anastomosis done in 14 patients out of which 12 conceived (85.7%) ,bilateral ampullo-ampullary resulted in pregncy 2 from 5(40%).

Maya et al (2003) in a prospective analysis of 22 women who underwent microsurgical tubal reversal found that 75% conceived after isthmo-isthmic anastomosis, 33.3% after isthmo-ampullary anastomosis and none after ampullo- ampullary anastomosis.

6. **Length of the reconstructed tube**

Among various factors affecting success after tubal recalalization, post reversal tubal length is most important. In our study maximum number of patients (60%) had final length more than 6 cm and 90% more than 4 cm.

Among total patients conceived 78.9% had final length of tube more than 6 cm. The pregnancy was achieved in 83.3% of the women when the tubal length was more than 6 cm comparison to 44.4% when the length was 4-6 cm. Mechanical procedures (laporoscopic ring occlusion) that produce minimal damage to the isthmus of the tube are the most favourable. Non of the patient having final length of tube less than 4 cm conceived.

In 1980 Sherman and Siber reported 100% pregnancy with tube length > 4 cm and 0% when tube length < 3 cm..

Jain et al (2003) confirmed the importance of tubal length in terms of live birth rates by their prospective study. When length of tube was more than 8 cm, the pregnancy rate was 83.33% which was markedly reduced to 4 %, if length of tube was less than 4 cm.

7. **Prevention of adhesion**

One major factor causing failure to conceive is the formation of pelvic adhesion. This is prevented by minimal and gentle tissue handling., not leaving talc or starch material from the gloves and lint pieces of the swabs in the field, maintaining proper haemostasis by use of electrocautery by frequent irrigation with normal saline or Ringer's solution, which prevent drying and necrosis of tissues and cleans the operating area of foreign materials and use of nonreactive suture materials.

8. **Fertility outcome**

In our study mean interval from recanalization to conception was 5.63(SD-3.09) months.Among total conceived patienrts 94% conceived within one year,out of which 73.3% resulted in live birth.majority patients(52.6%) conceived within 4 month of recanalization.Over 75% of the successful pregnancies in the series studied by Paterson were

conceived within 1 year of sterilisation reversal.[12] Yadav et al (1998) study showed Fifty percent of patients conceived within first 12 months of reversal of sterilisation.[13] Mean interval between recanalization and pregnancy was 6.5 month according to jaykrisnan et al.

In our study It was found overall conception rate was-63.3%, intrauterine pregnancy noted in 60% cases. 1 case was ectopic pregnancy. Among conceived patient 78.8% were live birth .ongoing intrauterine pregnancy in 10.6%.there was 1 ectopic and one abortion. Brar et al (2000) showed 68% intrauterine pregnancy. Biswas and Mondal (2006) showed intrauterine pregnancy rate of 66.27%.Gopal et al found over all conception rate was 55.5% out of which 72% live birth and 12% eectopic pregnancy. In study by jaykrisnan et al it was found 58.8% conception rateIn a retrospective study by Yadav et al (1998) the overall conception rate was 68%, out of which intrauterine pregnancy rate was 62%, ectopic pregnancy rate was 6% and the abortion rate was 6%.

Our pregnancy rate is comparable to all the above studies.

CONCLUSION

Successful fertility outcome results when

Age of the patient is less than 30 year. Type of previous sterilization was laparoscopic (here fallope ring application).Interval from sterilization to recanalization is within 6 years. Site of reanastomosis was isthmus-isthmus. Final length of the tube is more than 6 cm.

Sterilisation though intended to be permanent method of birth control, it lead to some women later regretting in life and requesting for reversal. Recanalization procedure being simple and effective method in respect to IVF is increasing in demand for sterilisation reversal. During sterilisation surgeons should remember laparoscopic sterisation is preferred and site of occlusion is isthmus so that every sterilised women can undergo recanaization operation if circumstances arises later in life.

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