TUBOPLASTY IN THE TREATMENT OF STERILITY*

by

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Introduction

The history of plastic operations on the fallopian tube can be traced as far back as the latter period of the nineteenth century. In 1885, Martin of Germany performed the first salpingostomy operation, while Watkins, a Chicago Surgeon, was the first to perform the operation of cornual implantation of the tube in 1896. (Hellman, 1956). Cullen, of Johns Hopkins Hospital, reported, in 1921, a seven month still-birth complicated by placenta praevia following tubal implantation. Subsequently, Solomons (1927), Markoff (1930), Reiprich (1932), Bonnet (1933) and Greenhill, in 1937, reported varying number of pregnancies, both uterine and extrauterine, following the operation of tubal implantation. In 1894, MacKenrodt of Germany reported 2 successful cases following salpingostomy operation. Gelhorn, reporting a successful case following salpingostomy in 1911, mentioned that up to that time the literature of Germany, France and America contained 13 other cases of equally good results. (Greenhill, 1937).

Sovak and later Bonney improved the technique of the operation. Introduction of insufflation test by Rubin in 1920, hysterosalpingography, culdoscopy and other special investigations as well as Castello's suggestion to use polyethylene tube, have further helped the development of plastic surgery on the tube. In India, Shirodkar made valuable contributions towards tuboplasty from time to time.

In this article an attempt is made to study and evaluate the role of tuboplasty in the treatment of sterility, from the observations made at the Lokmanya Tilak Municipal General Hospital, Sion, Bombay.

Material and Methods

There were ninety-nine consecutive tuboplasty operations performed during a period of five years from the beginning of 1960 to the end of 1964. The total number of gynaecological operations performed during this period was 7661, giving the incidence of tuboplasty operation as 1.29 per cent. There were 43 tubal implantations and 56 salpingostomies. Table I shows the year-wise distribution of the tuboplasty operations during the period of the study.

Age: Sterility is essentially a problem of reproductive age group. Seventy-two cases, 72.72 per cent. were in the age group of 21-30 years.

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TABLE I

Year-wise Distribution of Tuboplasty Operation in the Present Study

Year	Total no. of gynec operations	No. of tubal implantations	No. of salpingostomy operations
1960	1148	7	18
1961	1302	5	7
1962	1838	12	16
1963	2045	13	10
1964	1328	6	5
Total	7661	43	56

Incidence of tuboplasty operations: 1.29%

Indication: The main indication for the operation was sterility, primary in 42 cases and secondary in 49 cases. The remaining 8 cases were operated on for some other indications (5 had myomas, 2 had ovarian tumours and one had chronic appendicitis and tubal surgery was performed when found necessary). Of the 49 cases of secondary sterility 30 had two or more full-term deliveries, 10 had one full-term delivery, 8 cases had natural abortions while one had an induced abortion performed on her. The last case incidentally had bilateral tubal blocks.

Selection of a case: In every case both partners were investigated for sterility. Other factors were ruled out by proper examination and investigation. The tubal occlusion was diagnosed with the help of Rubin's test and hysterosalpingography. The endometrial pattern was studied by biopsy. Serological investigations were performed in suspected cases of venereal disease and they were treated adequately when necessary. Culdoscopy and Speck test, however, were not performed.

Types of operations: In 43 cases operation of cornual implantation was performed by Shirodkar's technique (Shirodkar 1960) using polyethylene tube. In 56 cases operation of salpingostomy, terminal or lateral, was performed by using Bonney's technique which is a modification of Sovak's technique.

The polyethylene tube was kept from 4-6 months in cases of cornual implantation. In all cases subsequent patency test was performed at suitable intervals.

Follow-up: Twenty-one of the forty-three cases of cornual implantation and 27 of 56 cases of salpingostomy, a total of 48 out of 99 cases (47.4%) could be followed up. The follow-up period varied from 1 to 5 years. During follow-up, in every case detailed history was taken, thorough clinical examination was performed and special investigations such as patency test, hysterosalpingography etc. were carried out whenever necessary. In some cases, the male factor also was investigated.

Anatomical patency of the tube: Of the 48 cases followed up, hysterosalpingography was performed in 37

cases. Eleven cases had conceived following the operation of tuboplasty, suggesting post-operative patency of the tube.

Of the 21 cases of tubal implantation operation, 4 had conceived following the operation. In 7 cases of pre-operative bilateral cornual block, post-operative hysterosalpingogram showed recurrent bilateral cornual block. Of the 10 cases of unilateral tubal implantation only 4 maintained patency post-operatively, and 6 cases had previously healthy tubes blocked in addition to the operated ones following the operation. Thus 38 per cent of the cornual implantation cases had post-operative patency of the tube and in 62 per cent of the cases there was recurrence of blockage. It is to be noted that in 6 cases (28.5%) previously healthy tubes were blocked post-operatively.

Of the 27 cases of salpingostomy operation, seven cases conceived following the operation. Two cases were explored later for some other surgical conditions and the tubes were found to be blocked. In 14 cases (50%) there was recurrence of blockage as proved radiologically. (In 4 cases, 14.44%, previously healthy tubes also were blocked).

Outcome of pregnancy post-operatively: As shown in Table II, there were totally 4 pregnancies—1 extrauterine and 3 intrauterine full-term—in 21 cases followed up in the series of 43 cases of cornual implantation. The corrected incidence for the extrauterine, intrauterine full-term pregnancies and total pregnancies was 4.8%, 9.5% and 19.5% respectively.

TABLE II

Summary of Outcome of Pregnancy in the Present Series

Operation	Cases	Ectopic	Abortion	Intra-Uterine full-term pregnancy	Total Pregnancy
Cornual Implantation	43	1(2.38%)	—	3(6.9%)	4(9.3%)
Corrected		4.8%		9.5%	19.5%
Salpingostomy	56	2(3.5%)	—	5(8.8%)	7(8.0%)
Corrected		7.7%		18.5%	25.9%
Total	99	3(3.03%)		8(8.08%)	11(11.01%)
Corrected		6.25%		(16.66%)	23%

Similarly there ware a total of 7 pregnancies—2 extrauterine and 5 intrauterine—among 27 cases followed up in the series of 56 cases of salpingostomy operations. The corrected incidences for the extrauterine, intrauterine full-term pregnancies and total full-term pregnancies was 7.7% 18.5% and 25.9% respectively.

Table III shows similar figures reported by various authors.

There were no abortons, stillbirths or premature deliveries in the series.

Discussion

The role of tuboplasty in the treatment of sterility is still a debatable subject. Standards of discussion about tubal obstruction and surgical attempts to relieve the same are not clearly recognised and used. Erhler (1963) strongly condemns the opera-

TABLE III
Incidence of Pregnancy following the Operation of Tuboplasty

Author	No. of Operations	No. of Pregnancy	Per cent
CORNUAL IMPLANTATION			
Greenhill (1953-54)	44	16	36.36
Puigmacia (1960)	203	55	22.11
Siegler & Hellman (1963) ..	18	2	11.11
Present series (1966)	43	4	10.00
		(Corrected incidence—20.00)	
SALPINGOSTOMY			
Comminos (1954)	21	6	16.00
Bravo (1954)	29	9	24.00
Chalier (1956)	71	11	15.60
Present Series (1966)	56	7	9.00
		(Corrected incidence—18.50)	

tion, Greenhill (1956) and TeLende (1962) are reluctant to perform it, while Shirodkar (1964), Hellman (1956), Moore-White and Green-Armytage (1962) favour it.

Before attempting an operation of tuboplasty it is imperative for the gynaecologist to establish the diagnosis of organic tubal block beyond any doubt. The possibility of spasm of the tubes causing tubal blocks should be well kept in mind. Only safeguard against this pitfall will be repeated Rubin tests, hysterosalpingograms and culdoscopic examination with instillation of solution in the uterus.

Fibrosis and adenomyosis leading to closure of the implanted end of the tube, undiagnosed Koch's infection, ascending sepsis, faulty surgical technique and improper use of polythene tubing are but few of the causes of failure in tuboplasty.

The aim of tuboplasty should be to restore anatomical and physiological patency of the tube, which will minimise the incidence of recurrent blockage and ectopic pregnancies and favour full-term pregnancies. Anti-inflammatory action of cortisone is taken advantage of following the operation. In the present series all but 3 of 21 cases of tubal implantation were given prednisolone in tapering doses for 1-2 months. Of the 3 cases without cortisone post-operatively, 2 had blocked tubes again and one had maintained patency. From a small series like this, it is difficult to opine about the value of cortisone in the plastic surgery of the tubes. Shirodkar (1965) instils locally a solution of cortisone and terramycin post-operatively. He also advises a course of Enovid tablets for 3 months to prevent endometriosis at the site of implantation.

Among various tuboplastic operations salpingolysis and salpingostomy give better results than cornual implantation of the tube (Hellman, 1956, Pous Puigmacia, 1960, Palmer, 1960).

A note of caution—one should not attempt cornual implantation operation on one tube if the other tube is patent. Disregard of this fact in the present series had resulted in block-

age of previously healthy tube along with the implanted tube in 6 (26%) of the 21 cases of cornual implantation. One can either leave the patient unoperated or excise the diseased tube.

It is true that one cannot guarantee a complete success of the operation and danger of ectopic pregnancy is a real one. And it is equally true that results following non-surgical therapy of occluded tubes, such as insufflation of air and carbon dioxide, hysterosalpingograms and local instillation of cortisone are not inferior to those following surgery (Grant *et al*, 1948; Gray, 1953; Kurzork *et al* 1954, Zanarthy *et al*, 1953). But one should do one's best to offer every chance to a sterile woman to conceive. And when it comes to this, tuboplasty definitely has its place in modern gynaecology.

A skilled surgeon specialized in tuboplasty obtains better results than one performing it occasionally. Both the partners should be informed about the results of the operation and hazards associated with it. A very thorough examination of the couple is essential. A fixed uterus and adherent ovaries suggestive of pelvic infection offer poor chances of success. But with proper selection of a case, antibiotics, judicious use of hormones, improved technique and skillful surgery one can definitely hope for better results.

Summary

1. Ninety-nine consecutive tuboplasty operations performed over a period of five years with 48% follow-up have been analysed to evaluate the role of tuboplasty in the treatment of sterility.

2. Overall incidence of pregnancies for the series of 48 cases followed up was as follows:

Ertrauterine pregnancy	6.25%
Full-term normal pregnancy.	18.66%
Total pregnancy.	23.00%

3. It is not advisable to attempt unilateral cornual implantation in the presence of contralateral patent tube. We had 6 cases of previously healthy tubes blocked following the operation of unilateral cornual implantation.

4. It has been suggested that with due care in selection of a case, judicious use of hormones and proper surgical technique one can achieve better results.

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