TUBO-UTERINE IMPLANTATION FOR STERILITY

FOLLOWED BY FULL-TERM PREGNANCY

BY

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(WITH SPECIAL PLATE)

The first tubal implantation resulting in full-term pregnancy was reported by Shaw and Cullen in 1921. The second recorded was by Unterberger in 1925. Von Graff in 1936 published the results of the seventy tubo-uterine implantations reported in the literature. Of these twenty-six were followed by pregnancy; only twenty-three, however, went to full term, one ended prematurely, one terminated in abortion, and one was an ectopic gestation—that is, an incidence of pregnancy amounting to 32.9 per cent.

Greenhill (1937), in order to determine the sentiment of American gynaecologists concerning salpingostomy and tubal implantation for sterility, sent a questionnaire to members of the American Gynecological and Obstetrical Society and the American Association of Obstetricians, Gynaecologists, and Abdominal Surgeons. One hundred and seven replies were received.

Fifty-three of the specialists had never performed a salpingostomy. Eighty-eight had never considered tubal implantation as an operation worth performing for the purpose of overcoming sterility.

On the other hand, thirty-five were strongly in favour of plastic operations upon the tubes, believing that the misery associated with sterility justifies the technique, however meticulous, however disappointing. Their results worked out at one pregnancy for every fifteen operations, and one full-term living child for every twenty-two abdominal sections.

The same atmosphere of pessimism is found in this country. For instance, Beckwith Whitehouse in the fourth edition (1935) of *Eden and Lockyer* writes: "The technique requires considerable skill and the operation is not lightly to be undertaken. The method is as yet too recent and the published records of success too few to express a considered opinion as to its ultimate value." Later, however, he states that he has had one successful case.

Similarly at the sixth British Congress of Obstetricians and Gynaecologists, 1936, after a stimulating paper on the subject by Bethel Solomons (1936), the majority of those present expressed the opinion that the abdomen should not as a rule be opened directly for the purpose of operating on the Fallopian tubes. On the other hand, a minority following the dictum of Harvey "to seek out and study the secrets of Nature by way of experiment" thought that all cases of tubal sterility should be carefully investigated with reference to previous history, menstruation, etc., and emphasized the necessity of methods of precision being first used to determine the site of obstruction, by far the most scientific being that of hysterosalpingography. They were of the opinion that if the case were suitable a plastic operation was worth while, no matter what part of the tube was involved.

Solomons stated that he had sent a questionnaire to 150 world-known gynaecologists. Fifty-three replies were received from those who operated upon the tubes. The answers showed that the incidence of pregnancy, after

salpingostomy alone, averaged from 8 to 10 per cent., though the figures of Rubin, Norris, Blair-Bell, and Gellhorn were very considerably better. After tubal implantation only six full-term live children were reported. In two cases abortion occurred.

It is significant that only thirteen out of the fifty-three surgeons who answered the questionnaire stated that they tested the patency of the tubes after operation. This is the acid test of any technique employed, and if not applied in every case as a routine measure, it were perhaps better not to operate at all. For my own part I believe the best test from both the physical and the psychological point of view is the salpingogram, which cannot lie and which should be taken two weeks, ten weeks, and twenty weeks after whatever operation has been performed. Using the Seguy apparatus (Drapier et Cie), put on the English market by Allen and Hanburys, radiographs can be taken without pain or anaesthetic, although if need be they can be done under morphine or evipan.

It is possible that a careful choice of cases and improved technique will yield in the future a larger incidence of success to those who are willing to operate; for, provided there is no complete occlusion of the Fallopian tubes by gonorrhoeal, post-abort, puerperal, or tuberculous infection and the semen of the husband is normal, there is no contraindication. Moreover, it must be realized that when the history and clinical findings are assured we have in salpingography a method which enables us to determine the site of occlusion and thereby base the strategy and tactics of any proposed procedure.

Operative Methods

Hitherto many surgeons have followed the technique of Douay (1936), Seguy, and Blair-Bell (1934)—that is, after applying a myomectomy clamp the cornu of the uterus comprising the interstitial portion of the tube is resected. The end of each tube having been bifurcated, it is then threaded with silkworm-gut and drawn within the uterine cavity and sewn *in situ* with fine catgut as in Fig. A.

FIG. A.—After wedge resection of the cornu and resection of the occluded isthmal part of the tube, it is bifurcated, threaded with gut, and drawn into the lumen of the uterus. It is then lightly sutured *in situ*.

Great care is taken, when the cut cornual surfaces are joined, that there is no strangulation of the implanted tube. A week later the silkworm-gut is removed. The tubes are tested with air or lipiodol from time to time.

Others have adopted the method of Solomons—that is, the uterus is first bisected. After excising the occluded area the distal and patent part of the tube is threaded with catgut. The cornu of the uterus is shaved to expose the line of the interstitial part of the tube, which is then expanded sufficiently with dilators to draw the threaded tubes into the lumen of the uterine cavity; fine anchoring sutures are then applied through the bisected uterus to keep the implanted tubes in place.

The technique of Bonney (1936) is the simplest. After applying his myomectomy clamp and ring forceps to the infundibulo-pelvic ligaments, he splits transversely the fundus of the uterus from cornu to cornu until the cavity of the uterus is opened. The occluded isthmial part of the tubes having been excised, a strand of silkworm-gut is threaded along each tube from the outer to the inner end. The tube ends are now laid carefully in the line of the transverse fundal incision so that the free amputated ends of the tubes are projecting actually into the cavity of the uterus. The long ends of the silkworm-gut are passed through the eye of a special dilator and drawn into the vagina after releasing the clamp. The tubes are fixed *in situ* by interrupted sutures of fine catgut, and as an additional safeguard a few sutures are inserted through the muscle of the tubes to the outer part of the cornual incision on each side. The silkworm-gut is removed about the tenth day. Mr. Bonney (1937) has had 18 per cent. of successes from salpingostomy, and has recorded five pregnancies following double and single implantation of the tubes with or without simultaneous salpingostomy. His results are inspiring and dispel pessimism.

It is proposed to describe a modification of this technique which has recently resulted in a full-term pregnancy.

Illustrative Case

Mrs. D., aged 25, married two years, was admitted with a history of four miscarriages to the West London Hospital on March 4, 1933, for retention of urine and intractable vomiting. The uterus was twelve weeks pregnant, retroverted, incarcerated, and fixed. Endeavour was made under an anaesthetic to replace it on two consecutive days, with failure on both occasions. The abdomen was therefore opened. It was seen that the fundus was fixed by dense adhesions to the posterior parietes, presumably subsequent to one or other of the four previous miscarriages. A modified Gilliam operation was performed. She went to full term, and as she had a typical funnel-shaped pelvis, demonstrated by measurements and radiographs, a lower-segment Caesarean section was performed on November 22, 1933.

Seeing that she had had four miscarriages and already two abdominal operations (one previous to admission for appendicitis), she and her husband demanded that she should be sterilized. Against strong advice this was insisted upon. Sterilization by excision of the cornual portions of the tubes was performed. Three days later the infant died, and was found at necropsy to have congenital heart disease (patent foramen ovale) and atelectasis.

In August, 1935, being very miserable, she came to the out-patient department asking if she could have another baby. Rather diffidently I informed her of such a possibility if she would submit to the operation of tubo-uterine implantation. Fig. 1 (see Plate) shows the uterus before operation. On October 20, 1935, with the following modifications, the Bonney technique was used. (Fig. 2 shows the result six months after operation.)

The Modified Bonney Technique

First a twelve-inch-long probe is passed eye forwards from the vagina through the cervix up to the top of the fundus uteri. It is then clamped *in situ* by a vulsellum on the cervix. On opening the abdomen a myomectomy clamp is placed round the cervix, and ring forceps are applied on the infundibulo-pelvic ligaments.

The proximal stenosed ends having been excised, a fine bodkin threaded with a long piece of Japanese silkworm-gut is passed gently through each tube so that about two inches remain visible at the distal end of the tubes, and about fourteen inches are available at the proximal ends to be threaded into the eye of the probe that is now exposed by making a transverse incision across the fundus of the uterus from cornu to cornu.

Each threaded tube with its intact mesentery is now snugly and rapidly placed in the V-shaped groove at each cornu so that about a quarter of an inch of each proximal end projects well into the endometrial cavity. Having lightly anchored the muscle wall of the tube with fine catgut at each cornu, the free long ends of silkworm-gut are threaded into the eye of the probe which has been referred to. The clamp being relaxed, the vulsellum on the cervix is released by an assistant and the probe slowly withdrawn, carrying with it the two lengths of gut. These are sutured to each side of the vaginal outlet at the end of the operation. The clamp and ring forceps being removed, the fundal incision is then closed with deep and superficial catgut as in a Caesarean section, particular attention being taken of the cornual portions, lest any undue compression of the buried though threaded tubes occurs. The technique with perfect haemostasis is not difficult, and can be completed under the hour.

The silkworm-gut is withdrawn in the ward on the twelfth day. The advantage of Japanese silkworm-gut is that it softens and it does not disintegrate or irritate.

On September 8, 1936, Mrs. D. reported that she had missed two periods. Examination showed that she was pregnant. She was carefully watched during the ante-natal period. Six weeks before she was due she was admitted for observation and rest, lest labour should come on prematurely or the fundal scar give. X-ray photographs showed at first a breech; after two weeks spontaneous version occurred. On April 7, 1937, a classical Caesarean section was performed. A healthy child weighing 5 lb. 10 oz. was delivered. There were a good many adhesions of omentum to the top of the uterus where the fundal incision had been made. These were not interfered with. The implanted tubes measured only two inches in length. No sterilization was done. The post-natal period was afebrile and uneventful. She left hospital on the twenty-eighth day, the baby weighing 6 lb.

Commentary

The case is reported in order to stimulate others to undertake plastic operations upon the tubes. Hitherto my personal success with salpingostomies has been four living children, the fruit of twenty-five laparotomies. Tubo-uterine implantation has been done thrice with one success.

The modified technique described is not difficult. The complete haemostasis obtained with clamp and ring forceps makes technical tactics easy.

Hitherto many gynaecologists have considered that operation is hardly worth while unless the Fallopian tubes are only occluded at the fimbrial ends; but when one considers how very miserable the sterile woman often is it does seem proper in a suitable case to give her the option of surgery provided some portion of the tube or tubes is patent, for, in the words of Bethel Solomons, "just as an occasional good golf shot impels the worst player to persist with the game, so occasional success in plastic surgery of the Fallopian tubes will impel the gynaecologist to continue his efforts and improve his technique, thereby achieving better results."

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FIG. 1.—Showing the uterus before operation.

FIG. 2.—Six months after operation.

LÉON FEINSON MULDAVIN: CRANIOCLEIDODYSOSTOSIS

R. A. DESAI: SCHAMBERG'S DISEASE