

MICROSURGERY FOR RECANALISATION FOLLOWING TUBECTOMY

(A Review and Preliminary Report of 12 Cases)

by

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Introduction

Since microsurgery in gynaecology is a relatively new field, many techniques for reconstruction are being practised. There is a long and continuing dispute about the ideal way in which reanastomosis of fallopian tube should be performed.

Objective of the Present Study

In the present communication, a brief analytical study of our experience on microsurgery will be reported emphasising on some of the specific technical details where controversy still exists. In most of the reported series, the number of cases are so small that a significant conclusion cannot be drawn. Moreover, some of the reported series consist of recanalisation on experimental animals. In these cases tubes are divided and immediately reanastomosed. The circumstances are different in tubectomised human females where there are possibilities of post operative adhesion and impaired vascularity.

Evolution, Justifications and Contradictions of Microsurgical Technique

Jones and Rock (1976) reviewing the world literature on tubal recanalisation in general, comment that regardless of the

technique used, success rate is not more than 30 to 40 per cent. The results are expected to be better in cases following reversal of tubal sterilisation, than following recanalisation on diseased oviduct. Siegler and Perez (1975) analysing 178 cases from the literature and 23 of their own observed an overall pregnancy rate of 39 per cent in reversal operations. In all these cases conventional technique of recanalisation was used. Using microsurgical technique however, either on experimental animals or on human females encouraging results have been reported by a number of authors (Winston, 1977; Khoo and Mackey, 1972; David *et al*, 1969; Seki *et al*, 1977; Patterson and Wood, 1977; Siegler, 1977; Diamond, 1977; Gomel, 1977). The results of reversal of cornual and isthmial block have definitely been improved by using microsurgical technique (Winston, 1977). Block in these segments of tube is usually seen following Irving type of tube sterilisation. These cases are usually treated by uterotubal implantation. Wirtz (1965) reported 54 per cent pregnancy rate following a special technique of uterotubal implantation. This result, however, has not been duplicated by other surgeons using similar technique.

It has been clearly demonstrated (Shirodkar, 1968; Winston, 1977) that in so-called cornual block, the interstitial portion of the tube remains patent and tubo-tubal anastomosis is possible. With

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Accepted for publication on 23-10-80.

the help of an operating microscope Winston (1977) reported pregnancy rate of 65%.

Hodari *et al* (1977), however, feels that microsurgical technique for tubal anastomosis is unnecessary and Hinderson (1979) reported equal results (60-70 per cent) in tubectomy reversal operations with and without using microscope in identical number of cases. He has categorically stated that expensive operating microscope and prolongation of operating time is not justified in reversal sterilisation procedures.

Pre-Requisites for Microsurgery on Fallopian Tubes

1. Operating microscope (30-35) or magnifying lens (4).
2. Fine bipolar electrocoagulator.
3. Fine non absorbable suture material (6/0 to 10/0 nylon).
4. Delicate microsurgical ophthalmic instruments.
5. 2/0 monofilament nylon—to act as temporary splint.
6. Some of the Shirodkar's tuboplasty instruments.
7. One bottle sterile normal saline solution containing 2 ml. Decadron and 0.5 ml. Heparin—for irrigation of the operating field.
8. Adequate training of the surgeon in microsurgical technique.

Materials of the Present Study

From January, 1979 reversal following tube ligation by microsurgical technique has been performed on 12 cases. Ten had ligation by Pomeroy's technique and 2 by partial salpingectomy. One of these cases had previous unsuccessful attempt of recanalisation.

Ground on which Recanalisation was Sought

Death of the children was the commonest ground for which reversal was requested. Every mother except 1 in this small series had 2 babies after which tube ligation was performed. Only 1, mother of 1 child delivered by caesarean section had her tubes ligated. One patient had tubectomy along with repair of uterine rupture following a previous caesarean section. Both the babies were still born. Bhatt (1979) has reported increasing demand for reversal of tube ligation during the last 5 to 10 years.

Criteria for Selection of Cases

Uptil now no case demanding reversal following tubectomy has been refused recanalisation. Preoperative hysterosalpingogram and laparoscopic examinations are helpful guides because these procedures predetermine the extent of adhesion and portion of tube excised or damaged by previous tubal ligation. Extensive adhesions, shortened length of the tube (less than 5 cm.) hydrosalpinx and fimbrial excision or damage restrict the scope and success of reconstructive surgery.

Important Technical Details of Microsurgery

Abdominal Incision

The incision should preferably be vertical midline because this allows adequate exposure and consequently minimum handling of tissues.

Elevation of Uterus and Fallopian Tubes

This can be done with the help of uterus holding forceps. Gomel (1977) used sponge pack in the pelvis soaked in hydrocortisone.

Occlusion of Cervix for Distending Uterine Cavity and Occluded Medial Segment of the Tube with Methylene Blue

This is essential to determine the extent of occlusion of the medial segment of the excised tube. The lateral segment occlusion can be determined by descending chromotubation.

Inspection of Segment and Length of Tube Excised at Previous Tubectomy and Extent of Existing Peritubal Adhesion

Ideal condition for reversal, in our opinion, is a tube in which not more than 1 cm. of isthmal portion has been resected. Of course, it is needless to say that there should be no or minimal peritubal adhesion. Williams (1976) has suggested that a successful repair is possible if the tube is divided 1 to 2 cm. away from the uterotubal junction. The repair becomes satisfactory because the tubal musculature in this area is thick and intraluminal diameters of the segments are equal. There is, however, one theoretical objection against ligation at this point. The lateral end of the isthmus is believed to be the neuro co-ordinator for sperm and fertilised ovum transport. Anastomosis at the isthmic-ampullary junction is most unsatisfactory because the lumen of the two segments of the divided tube are unequal. Reconstruction at the ampullary region seems to be technically easy because the lumen is big enough to be seen with naked eye. But following anastomosis, there could be buckling or distortion of the tubal fimbria. We have no experience of uterotubal implantation following tubectomy.

Use of Operating Microscope or Magnifying Lens

Initially we started performing micro-

surgery with the help of magnifying lens. We used magnifying lens in 8 cases, while operating microscope has been used in 4.

It is not necessary to achieve magnification throughout the course of the operation. Even for negotiating the splint (2/0 monofilament nylon) through the tubal opening at the cornual end, magnification is not essential. It is of course very useful while negotiating fine sutures (6/0 and above) through muscular and sometimes mucous membrane of the tube. Correct and symmetrical apposition of the cut ends of the opposite segment is the primary factor on which the success of operation will depend.

Use of Splint

Splint was not kept as a routine but the anastomosis was always performed over a splint. This helped not only in precise apposition of layers, but also aided in satisfactory manipulation of sutures by bringing the opposing raw edges nearer. The splint was left behind when it appeared that correct apposition could not be achieved after passing the sutures. Jones and Rock (1976) also feel that a splint is necessary in isthmus to isthmus anastomosis. 2/0 monofilament nylon has been used when necessary, which is believed to be less damaging for tubal mucosa (Williams, 1976). When the medial segment of the tube was short the monofilament nylon could be passed into the uterine cavity. Nylon was passed through the lateral segment of the tube with the help of Shirodkar's guide. When the nylon could not be passed into the uterine cavity, the portion of the nylon projecting from the lateral end of the tube was fixed on the surface of the ovary with 'oo' chromic catgut and was then coiled up and placed in the subcutaneous tissue under the skin for subsequent removal.

The splint was removed on the 7th post-operative day. Winston (1977) however working on rabbits has demonstrated generalised inflammatory response after use of splints.

Suture Material and Technique of Sutures

We have been using 8/0 nylon for tubal surgery. It has been reported that fibrosis and peritubal adhesions are less with nylon than with catgut sutures. Diamond (1977) used 10/0 monofilament nylon and reports 75 per cent pregnancies in cases of reversal operation following tubectomy.

In end-to-end anastomosis, when mucosal stitches are applied the threads are negotiated from 'inside-out' of one and 'outside-in' of the other segment so that the knots are placed within the lumen. This helps in eversion of mucosal edges thereby preventing intraluminary narrowing. Care was taken to include equal muscular bite of each segment as otherwise unequal bites would cause inversion of the edges towards the lumen causing intraluminary adhesion and narrowing. There is difference of opinion on the point of inclusion of mucous membrane in end-to-end anastomosis. (Gomel, 1977; Winston, 1977; Diamond, 1977; Garcia, 1972 and Seki *et al* 1977). Three to four sutures are inserted in two layers, One either mucosal or deep muscular and the other seromuscular. The gap in the mesosalpinx is closed in two layers inverting the raw edges inwards.

Haemostats and Prevention of Postoperative Adhesions

In order to get blood-free field of operation, continuous saline irrigation from the infusion bottle in preference to swabbing has been helpful. Speroff and Glass

(1973) advocates gentle handling of tissues and avoidance of rubbing the tubes with gauze sponges. With operating microscope or magnifying lens, injury to minute blood vessels and use of extra ligature or microcoagulation has been considerably reduced. Often we had to put a graft on the neighbouring raw area with a piece of excised parietal peritoneum. Following the operation, the pelvis is flushed with the sterile drip solution and the fluid is aspirated by a sucker. Low molecular dextran or intraperitoneal corticosteroids have not been used by us. It has been claimed (Neuvirth and Khalif, 1975; Golub and Schaffer, 1968) that low molecular dextran has antithrombotic and local siliconising protective effects on the tissues it coats.

Postoperative Hydrotubation

There is controversy regarding postoperative hydrotubation because of risk of ascending infection (Grant 1971; Williams, 1973; Hodari *et al*, 1977). We have used postoperative hydrotubation in cases where splint was not used. In these cases, as well as in cases where splint was used, hydrotubation was continued through three menstrual cycles, in the follicular phase. At the end of the third cycle, hysterosalpingogram was performed to assess the result of the operation.

Result of Operation

Out of 12 cases operated, 3 have conceived so far. One has been delivered by caesarean section and 2 others are pregnant 8 and 18 weeks. Postoperative hysterosalpingogram revealed patent tubes in 6 out of 9 remaining cases. The 3 successful cases had isthmic isthmial anastomosis.

Conclusion

So long as there is no sure method of temporary sterilisation, ligation of tubes,

considered to be a permanent procedure should be performed in such a way that reversal may be possible if circumstances demand such an operation in future. This consists of selection of tubal segment for ligation, length of tube to be excised, less handling of tissues, performing interval ligation and ligation in the proliferative phase of menstruation.

Results of reversal should be better than tuboplasty performed on pathological oviduct. Because these patients come from a high fertility stock and the tubal musculature and mucosa remain healthy. But since the intricate mechanism involved in the process of fertilisation and ovum transport, the anatomical and functional integrity of this delicate reproductive organ must be precisely maintained. This, as experience shows, can be achieved by gentle handling, use of delicate instruments and preferably establishing recanalisation under an operating microscope.

Out of 12 cases operated, tubal patency was demonstrated in 9 and of these 3 have conceived.

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