

# FEMALE LAPAROSCOPIC STERILISATION

(A New Approach and its Evaluation)

by

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## Introduction

In the control of the world population in general and that of India in particular female sterilisation plays a very important role. Any female sterilisation procedure which can reduce the discomfort and convalescence of the patient becomes highly acceptable. If it also gives better cosmetic results, its acceptability increases still higher. Female laparoscopic sterilisation with silastic ring application is one such procedure. It is also safe, simple, effective and easy to learn.

## Material and Method

First 200 cases of female laparoscopic sterilisation by silastic ring application carried out from June 1977 to August 1978 at Command Hospital (Southern Command) affiliated to Armed Forces Medical College, Pune are analysed. The follow-up of the cases extends from 18 months to 33 months.

These cases include 65 cases for puerperal sterilisation, 56 cases of sterilisation after first trimester M.T.P., 27 cases

of sterilisation after second trimester M.T.P., 38 cases of interval sterilisation and 14 cases of sterilisation after menstrual regulation procedure.

Puerperal sterilisation was performed 4 to 5 days after the delivery. Sterilisation on volunteers for 1st trimester M.T.P. and M.R. procedure was performed simultaneously with such procedure. All other cases were taken up by appointment.

The sterilisation was performed by standard method. The puerperal uterus was manipulated with sponge-holding forceps. The blades of this forceps were covered with rubber tubing which was left 1.5 to 2 Cm. beyond the end of each blade. This provided additional safety against perforation of uterus. The mobility of puerperal uterus was improved by administration of 0.2 mg of Methergin by intravenous route. A deep head low position was more helpful in some of these cases.

The silastic ring was applied on the middle third of the tube altering the site in those cases only where this part of the tube was not accessible.

The skin incision was closed with single mattress suture using silk. While applying this suture care was taken to include the tissues in the depth of the laparo-

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scopic puncture. This provided better haemostasis, excluded dead space and probably is prophylactic step against occurrence of umbilical hernia.

Electrocardiogram was taken in all cases before the induction of anaesthesia, after induction of anaesthesia, after pneumoperitoneum and on the conclusion of operation.

#### Observations

1. *Weights of Patients:* Obesity increases the difficulty in performing any laparoscopic procedure. The weights of the patients ranged from 32 kgs to 65 kgs with an average of 46.6 kgs. In this range of weights no difficulty was experienced in performing laparoscopic sterilisation.

2. *Anaesthesia:* By and large general anaesthesia with muscle relaxant has been used in this series. Local infiltration was used in 15 cases and spinal anaesthesia was used in 5 cases only, in 1 case after local infiltration proved inadequate. In 1 case Katamine was used.

3. *E.C.G. Recording:* Being the first series of its kind in the college and using no specialised monitoring system for pneumoperitoneum it was decided to take E.C.G. in all cases. Serial E.C.Gs. were taken in all cases as mentioned under material and method.

In none of these records any abnormality was noticed except for slight transient tachycardia in 1 case. It is important to point out that carbon dioxide for pneumoperitoneum was used in 24 cases only, in all other cases nitrous oxide was used for inducing pneumoperitoneum.

4. *Associated Disorders:* Fifteen patients had associated medical or surgical conditions. Nine patients had previous laparotomies, 1 of them had 2 caesarean section operations. One patient had previous unsuccessful vaginal sterilisation.

Medical disorders were present in 5 cases—operated mitral stenosis, diabetes melitus, mental retardation 1 case each. Two cases had pulmonary tuberculosis.

Previous laparotomy was not considered as a contraindication. However, the approach was modified and procedure took longer time. A compensated heart disease is not a contraindication either.

5. *Silastic Ring Material Used:* Falope rings, supplied by the PIEGO, were used in the earlier part of the series. Later on Chimcon Bands manufactured by M/s. Chimco Bio-medical Engineering Co. of Bombay have been used. Indigeneous bands appear as effective as Falope rings.

6. *Difficulties Encountered:* Most of these difficulties were encountered in the earlier part of the series. With increasing experience the difficulties are on the decline. Never-the-less these difficulties are worth mentioning.

(a) In 8 patients it required more than one attempt to correctly place the end of Verres Needle before inducing pneumoperitoneum. The peritoneum is adherent in the region of umbilicus. It is now a routine practice to aim the tip of the needle at the apex of the umbilicus. The adherent peritoneum permits easy penetration as it cannot recede. The same practice is used while introducing trocar and cannula.

(b) In 3 cases more than one attempt was required to introduce the trocar and cannula. The authors prefer pyramidal trocar which requires less force to introduce with lesser chances of sudden and deep penetration.

(c) On 3 occasions one ring was lost in the peritoneal cavity. Probably the ring got damaged during the process of loading and gave way while being slipped onto the tube. No effort was made to retrieve the ring in any case.

(d) On 4 occasions ring was not applied on the tube. On scrutiny it was seen to have been applied on the round ligament on 2 occasions and on mesosalpinx and ovarian ligament on 1 occasion each. Since the mistake was realised during the procedure, one further ring was applied on each tube. It is now the routine practice to identify the round ligament, the ovarian ligament and the tube before applying the ring.

(e) On 4 occasions the ring was considered to be unsatisfactorily applied. An additional ring was applied on such tubes.

All these difficulties had been of minor nature and easily correctable.

7. *Complications:* The total incidence of complications has been very low and this has prompted the author to admit that the procedure is simple and easy to learn. The following complications occurred in this series.

(a) Laceration of the tube with slight bleeding occurred on 3 occasions. Bleeding was insignificant and stopped spontaneously.

(b) Perforation of the uterus occurred on 3 occasions. One perforation occurred while passing the sound, second perforation occurred with flanged manipulator in a 2 weeks puerperal uterus and the third perforation occurred while manipulating post abortion uterus with a prototype manipulator under trial.

Some Japanese workers have noted that perforation of I.U.D. is more frequent in puerperal uterus between 2 to 8 weeks after delivery. The second case of perforation is therefore significant.

In all cases bleeding stopped spontaneously and no additional surgery was required.

(c) One patient developed wound infection which responded to antibiotics.

(d) One patient developed pyrexia

exceeding 100°F for which no cause could be found. Pyrexia settled down with symptomatic treatment.

(e) Prolapse of intestinal loop occurred twice. This was immediately reduced without difficulty. The author now uses a blunt trocar which is introduced into the sleeve after release of pneumoperitoneum. The sleeve is withdrawn during expiration.

(f) Eleven patients complained of pain, 6 complained of pain in abdomen and 2 of them required pethidine for 24 hours. Two patients complained of shoulder pain and remaining 3 complained of pain both in abdomen and shoulder.

8. *Blood Loss:* Blood loss in this procedure is negligible and usually less than one swab soakage in amount.

9. *Additional Diagnostic Aid:* The procedure permits the visualisation of intraperitoneal organs which helps in diagnosis of previously unsuspected and undiagnosed conditions. In this series, 12 patients had adhesions as a result of earlier surgery or infection. There were 2 cases of hydrosalpinx, 3 cases of fibroid uterus and 1 case had bicornuate uterus.

10. *Failures:* The follow-up of the cases extends from 18 months to 33 months but it has not been very satisfactory. However, no patient has reported with pregnancy to date. Since this hospital provides medical aid to a closed community population, it is felt that no pregnancy occurring in these cases will go unreported. It is therefore strongly presumed that no pregnancy has occurred in these cases.

#### *Discussion*

Methods of female sterilisation are under constant review and have undergone frequent changes. The search for an ideal method is still not over.

In advanced countries laparotomy sterilisation has nearly been replaced by modern methods, except in those cases where laparotomy is indicated for some other pathological condition. Colpotomy sterilisation never appealed the Western countries and its advocates are getting thinner even in India. It has no place in puerperal sterilisation.

The culdoscopy has been nearly replaced by laparoscopy. Where laparoscopy is not yet available, maniparotomy offers the next best approach.

In the initial phases of laparoscopic sterilisation tubal occlusion was achieved by electrocoagulation with or without division/resection of the tube.

Hazards in the use of electrocoagulation are well established now. Haemorrhage and bowel injuries, though rare, are very disturbing complications of electro-coagulation. These have been reported by Chaturachinda (1973), Edgerton (1973), Parekh (1977), Varma and Murphy (1977) and Dalal *et al* (1978). Similarly, the method has a high failure rate and poor prognosis for reversal operation.

Hulka *et al* (1973) and Kumaraswamy *et al* (1974) published their experience with special spring loaded clips. The main drawback of this procedure is difficulty in the correct application of the clips. YOON rightly deserves the credit for developing silastic rings and describing the method of its application in 1974. The ring is applied over a loop of fallopian tube with the help of special applicator introduced through the laparoscope. Since then this method of tubal occlusion is being extensively carried out.

The main difficulty in performing this procedure for puerperal sterilisation is the difficulty in manipulating the uterus, Chaturachinda (1973) has given up puerperal sterilisation. The author could

apply silastic bands in all cases of puerperal sterilisation.

Yoon and King (1977) experienced tubal transection 53 times out of 2643 procedures. The tubal transection in majority of cases occurs due to excessive pull on the tube. This can be avoided by applying ring on the middle third of the tube (certainly not too near the cornual end) and depressing the scope while slipping off the ring. The other cause of transection is application of ring on oedematous tube. In their series ring fell into peritoneal cavity on 12 occasions. On 2 occasions ring was applied on the small intestines. They reported 11 pregnancies, but only 1 can be entertained as failure of the procedure.

The prolapse of omentum or intestinal loop occurred on 2 occasions. These patients were struggling out of the anaesthesia. The present routine of introducing a blunt trocar into the sleeve and removing during expiration has eliminated this complications.

In the present state of knowledge laparoscopic approach for female sterilisation appears the best approach. Tubal occlusion with silastic ring application is safe, simple and easy to learn. Although in this series of 200 cases no failure has been seen yet the effectiveness has to be established by larger series and over a longer period.

#### Summary

Two hundred cases of laparoscopic female sterilisation by silastic ring application are analysed.

The cases include all categories of volunteers i.e. interval sterilisation, medical termination of pregnancies as well as cases of puerperal sterilisations. Previous laparotomies and valvular heart disease are not considered as contra-indications.

The difficulties encountered and complications experienced are analysed. Both were of minor nature, low in incidence and show a decline with experience of the surgeon. No failure has been reported.

The procedure is safe, simple and easy to learn and with a very high acceptability. It is a more desirable method for puerperal sterilisation.

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