

LAPAROSCOPIC YOON RING STERILISATION—A CAMP APPROACH

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Laparoscopic ring sterilisation consists of application of inert silicone rubber bands around a loop of fallopian tube, under laparoscopic view. These bands were first introduced by In Bae Yoon in 1973. They are made of silicone rubber material which is composed of dimethylpolysiloxane with 5% barium sulphate. This sialastic rubber is of special consistency so as to retain more than 90% of its memory when applied to the tube. These Yoon rings are 2.2 mm thick with an inner diameter of 1 mm when unstretched and 6 mm when stretched on the loader.

A preliminary report regarding the use of these sialastic bands and their relative safety was published in 1974 and since then more and more articles have appeared to confirm their efficacy and safety (Chatman, 1978). The method of laparoscopic electric cauterisation of the tubes has gradually lost its popularity because of the serious potential problems it can have (Levinson, 1975). The spring loaded clips have failed to become popular because of the significant failure both in their technical application and failure rate in sterilisation (Farooqui and Bazyoli, 1975). Laparoscopic Yoon ring sterilisation apart from being simple, offers great advantages in terms of reduced operating time, need for less pneumoperitoneum and being easily teachable. The fact that the patient can be sent home within a few

hours of the operation is a great asset and this single factor per se has been a major factor in raising the patient acceptability for sterilisation operation because of the minimal disruption caused to their household routine.

Camp approach in female sterilisation is gaining popularity because it provides opportunity of pooling all the facilities and technical manpower at a specified place and time. This specially organised technical pool is then put to best economic advantage by performing maximum number of operations in a specified period of time.

Planning of the Camps: These camps were organised in collaboration with the district health authorities who with their network of P.H.C., sub centres and field workers took the responsibility of approaching and motivating the target women. The acceptors were brought to the respective P.H.C. in the morning of the camp by the F.W. workers, picked up from there by the vans detailed by the C.M.O. and brought to the venue of the camp. Preliminary history taking, general examination including vaginal examination, routine Hb % and urine for sugar and albumin were done by qualified personnel and proper records maintained.

Preoperative Preparation and premedication

Xylocaine sensitivity was tested in all cases. Each patient was premedicated with

I/V cocktail of pethidine 100 mg and inj. Diazepam 10 mg just before wheeling them to operation theatre. In most of the cases this sedation was enough but in few uncooperative patients another injection of Ketalar 50 mg I.V. was given on the table. This was successful in ensuring adequate analgesia in all cases.

Technique of operation and sterilisation of equipment

The equipment was sterilised by keeping it in Cidex solution for a minimum of 5-7 minutes in between each operation while all the equipment was dipped in Cidex for atleast 45 minutes before starting the first operation. Each case had 5-7 cc of 1% Xylocaine solution infiltrated in the subumbilical fold of skin and deep layers. A skin deep incision was made along the lower edge of the umbilicus. Patient was asked to bloat her abdomen forcefully and a Touhy needle was inserted in the abdominal cavity through the skin incision and connected to the pneumoperitoneum apparatus. No towel clips were ever applied to lift the abdominal wall before introducing the pneumoperitoneum needle. Intraabdominal pressure was maintained between 10-15 mm of Hg and approximately 1 to 1½ litres of gas was passed.

After introducing the trochar and cannula the laparoscope with loaded rings was passed and tubes visualised. The tubes were held approx. 3 cms from the uterine end. Care was taken to catch the full thickness of tubal lumen avoiding extra mesosalpinx in the prongs. While the fallopian tube was sucked into the inner shaft of the applicator care was taken to simultaneously move the scope towards the mesosalpinx in order to minimise tension on the fixed uterine end of the tube and thus avoid an inadvertent resection of the tube. A well applied ring

leaves a completely blanched knuckle of the tube distal to the ring. Another ring was applied on the opposite side in a similar manner. Each case was viewed and verified to be correctly occluded by a senior member of the staff before the scope was removed. After expelling the gas and removing the trochar a single catgut stich was applied to the skin edges. All cases were advised inj. Streptopencillin 1 vial I.M. daily for 6 days and tab. paracetamol 500 mg 8 hourly for 48 hours as a routine. The cases were transported back to their homes by the vans provided by the district health authorities and followed regularly by the A.N.M. of the respective area.

Operating time

A total number of about 1000 cases have been operated by now in different camps held in this district. The average operating time per case in these camps was calculated by noting the time at the start of the first operation and the time of completion of the last operation during a particular camp. This divided by total number of laparoscopic sterilisations performed was taken as average camp time per case. This included the time spent on medical terminations. Average time in these camps was 5-6 minutes per case. In general, the operating time per case is related to:

- (i) Associated M.T.P.
- (ii) Large uterus
- (iii) Distended bowel
- (iv) Full bladder
- (v) Omental adhesions
- (vi) Experience of the operator

Follow-up: All the cases were followed regularly and visited by the staff of the respective P.H.C. for at least one year. The stich was removed on 7th day by the

M.O. at P.H.C. Any complication was tabulated on cyclostyled forms and brought to the notice of the laparoscopist in charge of these camps.

Results

Analysing the demographic data of initial 400 cases it was found that 70% cases were in their thirties with 3-5 children with minimum of 2 male children. Only 3% of them had 2 living children. Eighty-eight per cent of cases were from poor economic strata with total family income of less than Rs. 500 per month.

Popularity of Laparoscopy and patients' preference for this method of female sterilisation was revealed when 80% of these patients, when asked willingly agreed to advocate this particular type of operation to their acquaintances. They based their preference for this method on the fact that it did not involve hospitalisation and needed only limited period of bed rest.

Complications: The complications faced during surgery and postoperative period were divided in following three groups:

- (a) Immediate operating room problems.
- (b) Postoperative problems requiring hospitalisation.
- (c) Follow-up.

Immediate Operating Room Problems Table I

Reference to the Table will reveal that three bulbs fused during initial 50 operations because of power fluctuations in this industrial areas. Use of the voltage stabiliser since has made marked difference in the life of these bulbs. No case had to be postponed because of difficulty in pneumoperitoneum. Alternative routes were helpful where infraumbilical puncture was not successful.

Misapplication of the rings was significantly high, probably because of the fact that training was an integral part of these camps. Since all the cases were viewed by a senior specialist before removing the scope, they could be detected in time and another ring applied on the tube. It was noted that the leash of vessels running parallel to the tube in the mesosalpinx created a ridge parallel to the tube and could be confused for the fallopian tube by a trainee. Some rings were wasted because of premature ejection in the abdominal cavity. These were removed with the prongs or left as such in some cases. Silastic is an inert material and left over rings do not create any problem except that they can cause foreign body reaction and fibrin deposition around these rings.

Eight cases of tubal transection seen in this series are attributed to:

(i) Inflamed oedematous tubes	1
(ii) Hyperaemic soft tubes associated with pregnancy	3
(iii) Holding the tubes too close to the uterine end	4

Postoperative problems requiring Hospitalisation

In all 5 cases out of a total of 400 needed hospitalisation. Their distribution was as follows:

(a) Uterine perforation following medical termination of pregnancy	2
(b) Small mesosalpinx haematoma for observation	1
(c) Hypotension during operation	1
(d) Septic pubic arthritis	1

TABLE I

Immediate operation room problems in laparoscopic ring sterilisation

Nature of Problems	Total No. of cases	Sterilisation completed by change in technique	Sterilisation not completed Procedure discontinued
I Equipment Problems	3	Three bulbs fused in initial 50 operations because of power fluctuations in this industrial area. After the use of a stabiliser no bulb has fused in 350 operations	
II Problems of pneumo-peritoneum and soft tissue emphysema	12	All completed successfully by (a) re-entry through same route — 7 (b) Entry from pouch of Douglas — 1 (c) Entry by puncture through fundus of the uterus — 3 (d) Entry through left flank — 1	
III Problems in visualising the tubes (a) Pregnant large uterus Pelvic adhesions	5 1	Tubes visualised by vaginal manipulation of uterus and increased Trendlenburg position Not completed	Procedure failed because the second tube could not be occluded. Husband advised vasectomy.
IV Tubal Transection	8	Cauterisation/application of rings on bleeding ends	
V Mesosalpinx haematoma	1	Small haematoma patient kept under observation for 24 hrs. uneventful	
VI Misapplication of rings All these misapplications were noted during check by a senior person and rectified by applying new rings.		. Round ligament — 4 . Ovarian ligament — 2 . Rt. Urachus near bladder — 1 . Mesosalpinx — 3 . Omental piece — 1 . Adherent to tube Partial thickness of the tube — 2	
VII Hypotension	1	Patient was given I/V fluids and oxygenated for half an hour—Improved	

None of the cases needed any surgical intervention. All the above cases were discharged after 24 hours, except the one with septic pubic arthritis. It is supposed that a dormant arthritic lesion was already present which was aggravated by the lithotomy position and a small haematoma formation.

Effectiveness of Contraception—long term follow up

Table III shows the details of prolonged follow-up of these cases along with explanation for subsequent pregnancies. Principal reasons for subsequent pregnancies can be

(i) Luteal phase pregnancy

- (ii) Undetected wrong application of ring
- (iii) Incomplete luminal occlusion

Case noted as pregnant on 7th day follow up was missed because of wrong history taken on the day of operation. M.T.P. was done on 7th day when she reported for stitch removal. Two more cases were noted as pregnant when they reported after one month for follow up. They are supposed to be luteal phase pregnancies. M.R. was done as outpatient. One pregnancy of 18 weeks reported 10 months after operation. Termination by saline instillation was done. Check laparoscopy revealed a wrong applications of left ring on the left mesosalpinx. New ring applied.

TABLE II
Post operative symptoms in 1st week

	Mild	Moderate	Nil
Pain	42.8%	5.5%	51.7%
Fever	79%	2.4%	18.6%
Vaginal bleeding	spotting for 48 hrs—24.4%	20%	55.6%
Stitch line	well healed 98.4%	Slight serum discharge needing dressing 1.6%	

TABLE III
Contraceptive effectiveness—long term follow-up

No. of visits (months)	No. of cases	Pregnancy reason unknown	Pregnancy reasons known	Explanation
7th post op. day	400	0	1	Preg. missed because of wrong history taking
1 month	400	0	2	Luteal phase pregnancies
3rd month	400	0	0	
6th month	300	0	0	
12th month	200	0	1	Check laparoscopy revealed the left ring on mesosalpinx—wrong initial application

Conclusion

Laparoscopic ring sterilisation is getting more and more popular in our country and camp approach will have to be the main method for tackling the large number of operations. These camps must be organised by a person who has vast experience in laparoscopy and is capable to tackling any emergent situations arising out of it. The results in terms of patient acceptance of the procedure com-

pared to other methods are very encouraging.

References

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TABLE I

RESULTS OF LAPAROSCOPIC RING STERILISATION

Case No.	Age	Parity	Operation	Result
1	28	1	Laparoscopic ring sterilisation	Success
2	32	2	Laparoscopic ring sterilisation	Success
3	25	0	Laparoscopic ring sterilisation	Success
4	30	1	Laparoscopic ring sterilisation	Success
5	27	0	Laparoscopic ring sterilisation	Success
6	35	3	Laparoscopic ring sterilisation	Success
7	29	1	Laparoscopic ring sterilisation	Success
8	31	2	Laparoscopic ring sterilisation	Success
9	26	0	Laparoscopic ring sterilisation	Success
10	33	1	Laparoscopic ring sterilisation	Success

TABLE II

COMPLICATIONS ASSOCIATED WITH LAPAROSCOPIC RING STERILISATION

Complication	No. of Cases
Adhesions	1
Haemorrhage	0
Infection	0
Perforation	0
Retained ring	0
Unilateral tubal ligation	0
Unilateral salpingectomy	0
Unilateral oophorectomy	0
Unilateral hysterectomy	0
Unilateral salpingo-oophorectomy	0
Unilateral hysterectomy and salpingo-oophorectomy	0
Unilateral hysterectomy and oophorectomy	0
Unilateral hysterectomy and salpingectomy	0
Unilateral hysterectomy and oophorectomy and salpingectomy	0