The Development And Experience Of Laparoscopic Tubal Sterilization In Nepal

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Historical review

An early development of laparoscopic sterilization is mentioned as a combination of two procedures-laparoscopy (sometimes known as as peritoneoscopy or celioscopy which is by definition an endoscopic examination of the interior of the peritoneal cavity by means of a laparoscope inserted through the anterior abdominal wall) and tubal sterilization-both conceived for different purposes but later combined to perform female sterilization. Anderson (1937) proposed laparoscopy as a method of tubal sterilization. Despite scattered clinical reports in the West, laparoscopic sterilization was handicapped by lack of overall demand for sterilization coupled with questionable legal status, and by still imperfect instrument until early 1960s.

With the development of more sophisticated auxillary equipment in West during sixties, laparoscopic sterilization gradually became popular by early 1970 around the world. Laparoscopic sterilization was performed for the first time in Nepal by the end of 1971 (Giri, 1973).

In the history of family planning programmes, sterilization has come to stay as most prevalent fertility control method all over the world. The worldwide records show that the number of couples who have undergone such surgical sterilization of one of the partners has increased from an estimated 3 to 4 million in 1950 to about 20 million in 1970 and 80 million in 1978 and are still increasing as the years pass by. It is hoped that by the year 1985, the number of such couples would be doubled

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Background of development

Surgical sterilization being a permanent method of fertility control and its increasing use of female sterilization in the popularization of two relatively simple, safe and effective surgical methods—laparoscopy and minilaparotomy; both of which can be performed as an out-patient procedure under local anaesthesia.

Among the various techniques of female sterilization, the laparoscopic tubal sterilization procedure has become popular in Nepal. In 1971 Dr. Wheelless, obstetrician and gynaecologist, Johns Hopkins Hospital, U.S.A., who visited Kathmandu for 72 hours introduced the laparoscopic tubal sterilization on 33 clients. During this period Dr. Kanti Giri, the then Medical Superintendent of the Maternity Hospital, received her initial training in laparoscopic sterilization and equipment from Dr. Wheelless. Dr. Wheelless made a return visit in April 1972 and reported favourably on the progress of laparoscopic sterilization in Nepal.

Upon the basis of satisfactory progress of laparoscopic tubal sterilization, the possibility of providing quick and easy service to the people, sterilization camps at the field level were organised. First camp was organised in Pokhara, a western regional centre, in January 1973 where 215 cases of sterilization were done in two weeks' time without any serious complications. Similarly, a second camp was arranged in the eastern region city of Biratnagar where 210 cases were successfully done within two weeks time.

After reviewing the results of these two initial camps, FP/MCH Project office decided to make avail of laparoscopic sterilization service at the peripheral level of the country through the organisation of mass sterilization camps after the monsoon rains and harvesting season are over.

Since last five years the author is attached to the Surgical Division of FP/MCH Project office as a full-time surgeon to provide female sterilization services. The author travels to different districts of the kingdom and performs laparoscopic operations at the camp sites during seasons. The duration of such camps lasts from 2 weeks to 3 months depending on the density of the population of the particular place. The author also performs between 30 to 40 such operations per month in a non-mobile (static) clinics. Thus the author has performed about twenty thousand laparoscopic sterilization in the kingdom up to this day.

Materials and method

Women who have completed their family size (at least 2 children above 5 years of age) are brought by the health workers in the camp setting. Motivated clients come to the clinics on their own to accept the sterilization services.

Pre-operative preparations

Preparation of the patient for the laparoscopic sterilization is more or less similar to general surgery. A detailed medical, surgical, obstetrical and menstrual history is taken and physical examination is done. A pelvic examination is performed to rule out pregnancy as well as pelvic pathology. Just before operation the patient is asked to empty the bladder.

Technique

Laparoscopic sterilization involves the insertion of a viewing instrument and a tubal occlusion device into the abdominal cavity through one or two small puncture type incisions.

The patients are asked to report to the camp in the morning at 9 a.m. with an empty stomach. Her dress is changed and her abdomen is shaved and cleaned. After placing her on the operation table, I.V. analgesic injections such as pethidine hydrochloride 25 to 50 mg and Diazepam 5 mg are given. She is then placed in the lithotomy position. The abdomen is cleaned with a solution of iodine and then draped with linen. In the next step, about 12 to 15 c.c. of one per cent Xylocaine or Lovocaine solution is infiltrated uniformly in and around the lower skin of the navel. A Sims speculum is placed in the vagina and the anterior lip of the cervix is caught with a vulsellum or tenaculum forceps and after introducing a sound, a Rubins cannula is inserted in the uterine cavity. Then the patient is placed in the Trendelenberg position. The surgeon then changes a pair of gloves. After lifting the abdomen, an incision of two millimetre is made with a sharp knife on the skin just below the inferior border of the umbilicus. A Touhy or Verres needle is then inserted into the peritoneal cavity and the needle is connected with the pneumoperitoneum insufflator. This insufflator has a mercury pressure monitor which helps the surgeon to know whether the needle is inside the peritoneal cavity or not. Then the carbon dioxide gas is introduced into the peritoneal cavity at the rate of one litre per minute at a pressure of 10Hmm of Hg and usually 1 to 2 litre of CO_2 delivered are enough. The needle is then taken out and the incision is extended from 1 to $1\frac{1}{2}$ centimetre. After carbon dioxide insufflation the lower abdomen gradually gets distended. The trocar along with its cannula is inserted into the peritoneal cavity. The escape of gas by 'hissing sound' on pressing the knob on the trocar sleeve indicates that it is inside the peritoneal cavity. The trocar is then removed and the laprocator is inserted through the cannula and the light source is connected in

the telescope. The general direction of insertion is toward the pelvic cavity. Once the telescope is inside the abdomen, after obtaining a clear visual field by cleaning the lens, if necessary the uterus is manipulated from below to get a clear picture of fallopian tubes and ovaries. The tube is then grasped at about 1½ to 2 cm away from cornual end by a tongue forceps brought down through the laproscator by movement of operating slide; and then by gently pulling the operating slide toward the thumb ring, the forceps are retracted and the grasped segment of the fallopian tube is tucked inside the scope. To keep off undue tension on the rest of the tube and mesosalpinx, the laproscator is pushed downward toward the grasped segment of the tube as the forceps are retracted. With the forceps tongue fully retracted, a spring tension is felt. This tension is overcome by applying more pressure on the operating slide and thus facilitating automatic release of Silastic or Yoon ring on the grasped fallopian tube producing a knuckle of about 1.4 centimetre. The knuckle is then released from the grasping tongues by extending the forceps again through the movement of operating slide. The forceps tongues are again retracted. The same procedure is repeated on the opposite fallopian tube. The silastic ring is loaded in the tip of laparoscope with the help of a loader and a guide. The laproscator is then removed and carbon dioxide gas is expelled out from the abdomen through the trocar cannula. The head end of the table is straightened and the skin wound is closed with 1 or 2 chromic catgut stitches. A dressing gauge is applied. The patient is then taken to the recovery room and kept under observation for 2 hours.

1 to 4 steps of application of silastic ring to the fallopian tube.

Post-operative care

The important conditions like blood pressure, pulse and respiration of the patient are noted. When her general condition looks satisfactory, a light snack consisting of biscuits and tea is served.

On discharge some analgesics, vitamins and antibiotics, if necessary, are supplied to take away with them.

Instructions

The clients are advised to take rest at home for a week. They are further advised to take care of the wound and are asked not to worry about if a slight bleeding per vaginun persists for a week or so.

Follow-up

The clients operated in the surgical unit of FP/MCH are instructed to report after one week and also immediately after her next period. They are further asked to report any time if problems like persisting pelvic pain, pelvic sepsis, menstrual disorder such as irregular menses, amenorrhoea, spotting and emotional upset are felt.

A study of medical record cards of 2,000 laparoscopy acceptors is given below highlighting the main points.

No. of Living Children of Lap Acceptors

No. of L. C. age	0	1	2	3	4	5	6	N.R.	Total.
15-19	-	-	-	-	-	-	-	-	-
20-24	-	1	35	108	45	11	2	-	202
25-29	-	-	68	277	220	77	27	-	669
30-34	-	-	27	168	201	130	80	-	606
35-39	-	-	14	54	101	98	111	-	378
40-44	-	-	3	10	14	32	69	-	128
45-49	-	-	-	3	4	4	6	-	17
Total (N)	-	1	147	620	585	352	295	-	2000
%	-	0.05	7.35	31.0	29.25	17.6	14.74	-	100.00

Age Distribution of Lap Acceptors

Age Group	15-19	20-24	25-29	30-34	35-39	40-44	45-49	Total
Number	-	202	669	606	378	128	17	2000
%	-	10.1	33.45	30.3	18.9	6.4	0.85	100.00

**Main highlights of follow up study of Laparoscopy
Acceptors : Surgical Unit
FP/MCH Project**

Lap. Acceptors without previous use of T.F.P.	Lap. Acceptors with previous use of T.F.P.M.	Reported menstrual disorder					Types of mens. disorder					Compli-
		Total	with pre- vious use of T.F.P.	with pre- vious use of T.F.P.	Total	Sa- ally	Spot- ting	Hea- vy	Irre- gular	To- tal	Fai- lure	
1634	366	2000	79	170	249	8	14	70	157	249	15	nil
81.7%	18.3%	100%	21.6%	10.4%	3.2%	5.6	28.1	63.1	0.7			

T.F.P.M. = Temporary Family Planning Method.

Of 2000 laparoscopy acceptors, 81.7 per cent of them come under the category of non-users of any family planning method while 18.3 per cent of them fall under the criterion of users of temporary family planning devices.

Further studies of their reference cards show that 249 cases (12.45%) had certain menstrual disorders as compared to 1,751 cases (87.55%) who had normal menstrual cycle.

Thus, out of 249 cases mentioned above only 79 cases (31.72%) were previous users of temporary family planning methods while 170 cases (68.28%) did not practice any method of family planning before acceptance of laparoscopic sterilization procedure. Further analysis of the data revealed that the rate of menstrual upset is 10.4 per cent in post-sterilised cases who were non-users of family planning method before whereas those cases who have used temporary family Planning methods come to 21.6 percent.

The reported menstrual abnormality could be due to the use of different family planning methods such as Depo-Provera (Depot-medroxyprogesterone acetate), IUCD, and continuance of lactational period. It is therefore not clear whether laparoscopic sterilization could initiate the cause for irregular, heavy or scanty menstrual cycle. The card study does not show a clear picture of menstrual pattern before sterilization.

There are some vague complaints from the operated clients like headache, general weakness, scar pain and back-ache. Again it is not clear whether these symptoms are related to the post-sterilization effects. Therefore, available data at present, do not show clearly whether these symptoms were pre-existing or any other medical conditions could be completely ruled out. It is therefore a problem for further research.

Operative complications

Out of 2,000 cases, only one case developed pelvic peritonitis after 4 days of operation. Two cases had mesosalpingeal haemorrhage during professional training period. All of them had been hospitalised and had conservative treatment. Fifteen cases had failed laparoscopy.

Camp site experience: As mentioned earlier that every year during winter season the author performs most of the operations at the camp site. The first case of laparoscopic sterilization performed in 1979 had to be opened by minilaparotomy to control the tubal bleeding because

of electro-coagulation via laparoscope could not be done as electric generator went out of order. About two years ago in 1982 this surgeon was busy introducing trocar in the pelvic direction, the patient all of a sudden became apprehensive and uncooperative. Then suddenly it occurred to this surgeon's mind that the internal organs of the patient might have been injured by trocar. So the patient immediately underwent minilaparotomy under local anaesthesia and heavy sedation. As luck would have it, it was found that no internal injury had occurred and the fallopian tubes were ligated by Pomeroy technique. The patient recovered well.

During 1983-84's last camp there was a report that one case died on the third day of operation. On inquiry, it was found that it was the same patient who had carcinomatous lesion all over inside the abdomen diagnosed after insertion of laparoscope. She looked emaciated and by mistake the laparoscope was inserted into her abdomen but she did not undergo sterilization procedure.

The author has noticed certain number of cases of uterine perforations by Rubin's cannula during manipulation, and also transection of the fallopian tube during the application of silastic ring. But none of them required surgical intervention and they did well on observation.

The medical team keeps on moving from one place to another to provide mobile sterilization service. Therefore it is not possible for the team to stay for a long time at one camp to provide routine follow-up services. Thus, the district family planning officer and the village health worker are responsible to carry out the follow-up services by making home visits and asking the progress report from the clients.

Each client is requested to report the progress following the operation, but the complicated cases only come to our notice. Such reported complications include wound sepsis, pain in abdomen, irregular menses, amenorrhoea and failure of laparoscopy.

Conclusion

In Nepal, as far as the author's personal assessment is concerned, laparoscopy and minilaparotomy are the most acceptable procedures. Of all the approaches to female sterilization, laparoscopy is becoming popular in Nepal because in the hands of a properly trained physician it is quick and highly effective. It may be pointed out here that the laparoscopy

was introduced first before minilaparotomy; and our experience shows that the clients like laparoscopic sterilisation more than the mini-lap. procedure. The annual statistics shows that the number of acceptors are increasing every year against the male sterilization (vasectomy). Laparoscopy is more popular in the Terai belt as compared to the hilly or mountainous regions of the kingdom. Although the number of cases undergoing laparoscopic sterilization show encouraging result, but there are multiple problems and hindrances to provide efficient services in a qualitative way because of our under-developed economy. Thus our surgical team has been performing operations without a minimum medical standard of emergency back-up equipment (trained staff for anaesthesia, resuscitation bag and oxygen cylinder).

In the remote mountainous region of the kingdom, the basic supplies like sterile gloves and towels inhibit handling of post-sterilized infections and other complications on the spot and thus the patients are requested to go to the nearest health clinic on foot which take them hours or even days to reach there. Again, the situation is more aggravated because of acute problem of transport and communication in such areas. If a problem of bleeding case occurs, the patient has to be brought back to the camp site either in Doli or Doko (a locally contrived carrying basket) on human back for further medical aid.

In many of the physicians' opinion, the laparoscopic sterilization is considered very difficult to reverse because of the use of electro-coagulation method which unreservedly damages a considerable part of the fallopian tubes. This author, therefore, has opted to use silastic or Yoon rings to accomplish the closure of fallopian tubes during laparoscopic sterilization thus facilitating, in case of expediency, reversibility.

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