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Timing of Laparoscopic Sterilization in Abortion Patients

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A total of 1604 laparoscopic sterilization procedures with variable time intervals after first trimester therapeutic abortion were performed at the Severance Hospital of the Yonsei University College of Medicine, Seoul, Korea, from May 1973 to October 1975. Two hundred fourteen women were sterilized immediately at the time of abortion; 359 were sterilized between 1 and 42 days later; and the remaining 1031 women were sterilized 43 or more days after abortion. Electrocoagulation and tubal ring application were the tubal occlusion techniques used. The findings indicate that patients who underwent the combined abortion-sterilization procedure did not encounter higher rates of technical problems and/or complications than the other 2 groups. Only a few of these 1604 women studied had potentially serious complications that necessitated subsequent laparotomy, hospitalization after sterilization, and/or hospital readmission.

Either first trimester therapeutic abortion or laparoscopic sterilization can be performed safely on an outpatient basis. The motivation to accept a permanent contraceptive method such as sterilization usually is high when a woman requests a therapeutic abortion. Thus, there are many logistic and programmatic advantages to performing the 2 procedures at the same time. However, whether or not the combined procedures are medically justified is still subject to controversy.[1-4] Although some investigators appear to favor the combined approach,[1,4] their results must be viewed with reservation, as the results were compared with those of laparoscopic sterilizations performed on nonpregnant women in other institutions, and complication rates resulting from laparoscopic sterilization differ markedly in different centers.

This report documents the authors' experience in 1604 women who were sterilized using laparoscopy at variable intervals after first trimester therapeutic abortion. The outcome of women who underwent the combined abortion-sterilization procedure was compared with those who underwent sterilization some time after the therapeutic abortion to determine whether the combined procedure was associated with a higher risk of technical problems and complications.

Materials and Methods

A total of 1806 first trimester therapeutic abortion patients were sterilized using single-puncture laparoscopy from May 1973 through October 1975 at the Severance Hospital, Yonsei University College of Medicine, Seoul, Korea. Standardized forms were used for recording pertinent sociodemographic characteristics of the patients, medical aspects of the procedure, surgical difficulties, complications, and other relevant events during and after the surgery. One thousand six hundred four (1604) healthy subjects who were sterilized for family planning purposes were included for study after excluding those patients with systemic diseases, previous abdominal surgery, pelvic pathology, or other concurrent surgery. The study patients were divided into the following 3 groups with respect to the timing of sterilization relative to therapeutic abortion: 1) those who underwent sterilization immediately after abortion (postabortion group, 214 patients); 2) those who underwent sterilization from 1 to 42 days after abortion (intermediate group, 359 patients); 3) those who underwent sterilization at least 43 days after abortion (interval group, 1031 patients). Electrocoagulation with tubal division and tubal ring application were the 2 tubal occlusion techniques used.

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For the postabortion group, the concurrent pregnancy of all 100 patients sterilized by the electrocoagulation technique was terminated by vacuum aspiration/curettage. Among the 114 patients sterilized by the tubal ring technique in the postabortion group, pregnancy was terminated by vacuum aspiration/curettage in 56 patients and by dilatation and curettage in the remaining 58 patients. For the intermediate and interval groups, pregnancy was terminated exclusively by vacuum aspiration/curettage.

The laparoscopic sterilization procedures per se were performed in essentially the same manner in all 3 groups. For electrocoagulation sterilization, the 2-burn technique was used, and the tubes were divided. For tubal ring sterilization, 1 ring was applied on each tube. All the surgery was performed by the teaching staff on an outpatient basis. In most patients, the surgery was done using local anesthesia (10 to 15 ml of 1% procaine) with neuroleptic analgesics (50 to 100 mg pethidine hydrochloride and 10 mg diazepam) administered 5 minutes before the procedure. Fifty-two postabortion and 31 interval patients sterilized by the tubal ring technique, as well as 5 interval patients who underwent the electrocoagulation procedure, were operated on using general anesthesia.

The patients usually rested for 2 to 4 hours after surgery before leaving the clinic. Three follow-up visits after surgery were scheduled: at 7 to 21 days, 6 months, and 12 months. All patients returned for the 7- to 21-day follow-up.

Analysis was performed by comparing the 3 groups of patients who underwent the same tubal occlusion technique in terms of their sociodemographic characteristics, immediate complications (during or immediately after the procedure and before discharge), early complications (those reported at the 7- to 21-day follow-up visit), and other relevant events such as surgical time, surgical difficulties, readmission, and pregnancy. For qualitative variables (eg, proportion of patients with 1 or more complications), χ^2 tests were used; for quantitative variables (eg, surgical time in minutes), analysis of variance was used to determine whether differences among the 3 groups were statistically significant ($P < .05$).

Results

For those who underwent electrocoagulation or tubal ring application, the mean age, mean parity, and percent of patients who were overweight generally were comparable among the 3 groups. The postabortion group was, however, significantly better educated than the other 2 groups (Table 1).

Among those sterilized by electrocoagulation, the immediate complication rate was 2.0% in the postabortion group, 2.8% in the intermediate group, and 1.9% in the interval group. The complications in the postabortion and intermediate groups were of a minor nature. However, major complications occurred in 4 patients in the interval group: 1 had excessive bleeding from the tube that required emergency laparotomy; 2 had bowel injuries, 1 of which required laparotomy; and 1 had a uterine perforation caused by the uterine manipulator. No early complication was experienced in the postabortion group. The early complication rates were 2.3% in the intermediate group and 4.6% in the interval group. Fever requiring antibiotics and incision wound infection were the most frequently reported complications. No serious early complication was experienced (Table 2). The differences among the 3 groups of either immediate or early complications were not statistically significant.

Among those who underwent tubal ring application, the immediate complication rate was 3.5% in the postabortion group, 3.3% in the intermediate group, and 5.7% in the interval group. The corresponding early complication rates in the 3 groups were, respectively, 3.5%, 1.7%, and 2.8%. There was no serious immediate or early complication, and pelvic pain or cramps were the most common problems among the 3 groups (Table 3). No significant differences were detected among the 3 groups concerning the incidence of either immediate or early complications.

Surgical time for the laparoscopic procedure was counted in minutes from the initial incision through final closure. Time spent during the therapeutic abortion in the postabortion group was not included. The mean surgical time spent on the electrocoagulation procedure among the 3 groups ranged from 10.5 to 11.6 minutes. In those sterilized by tubal ring application, the laparoscopic procedure required a longer time (14.7 minutes) in the postabortion group than it did in the other 2 groups (9.4 minutes for intermediate and 10.2 minutes for interval groups). The difference is statistically significant.

Difficulties in laparoscopic procedure were encountered in 5 cases. The cause of the difficulty in 1 postabortion patient was obesity and the causes in the 4 interval patients were obesity (2 cases) and difficulty in visualizing the tubes due to unsuspected pelvic adhesion (2 cases).

Only 3 patients, each sterilized by electrocoagulation, were hospitalized after the procedure, 1 in the postabortion group and the other 2 in the interval group. Also, 3 patients were readmitted: 1 with a tubal ring in the postabortion group (due to severe pelvic pain); 1 who had undergone electrocoagulation

Table 1. Sociodemographic Characteristics

Characteristics	Postabortion group	Intermediate group	Interval group
Electrocoagulation method	(*N* = 100)	(*N* = 177)	(*N* = 525)
Mean age (years)	34.1	33.4	34.3
Mean parity	3.1	3.3	3.3
Mean education (years)*	11.5	9.2	9.8
Percent overweight	5.0	5.7	4.4
Tubal ring method	(*N* = 114)	(*N* = 182)	(*N* = 506)
Mean age (years)	34.4	33.9	34.9
Mean parity	3.3	3.4	3.4
Mean education (years)	11.0	8.7	9.4
Percent overweight	1.8	3.3	4.6

* Difference between postabortion group versus intermediate and interval groups is statistically significant at $P < .05$.

in the intermediate group (due to severe abdominal pain; laparotomy revealed a hematoma in the cauterized site of the left tube); and 1 who had undergone electrocoagulation in the interval group (laparotomy was performed to repair a bowel injury that was not found during the procedure).

Patients were followed for 6 months or longer in 75% of the postabortion, 79% of the intermediate, and 80% of the interval group. Three pregnancies occurred in the postabortion group (1 pregnancy was probably due to failure of the vacuum aspiration/curettage to evacuate the conceptus), none in the intermediate group, and 4 in the interval group (1 woman had conceived prior to sterilization). All were intrauterine pregnancies.

Discussion

It has been suspected that the pelvic changes that occur during pregnancy may increase technical problems and/or complications if laparoscopic sterlization is combined with pregnancy termination.[5,6] One investigator, however, argued that significant varicosities in mesosalpinx are generally not encountered until 16

Table 2. Immediate and Early Complications/Complaints in Electrocoagulation Patients

	Postabortion group (*N* = 100)	Intermediate group (*N* = 177)	Interval group (*N* = 525)
Immediate complications/complaints*			
Excessive bleeding requiring laparotomy	0	0	1
Bowel injury			
Requiring laparotomy	0	0	1
Not requiring laparotomy	0	0	1
Uterine perforation	0	0	1
Mild mesosalpinx bleeding	1	3	1
Subcutaneous/subperitoneal emphysema	1	2	5
Anesthesia complication	0	0	1
No. of patients with ≥ 1 immediate complications	2 (2.0%)	5 (2.8%)	10 (1.9%)
Early complications/complaints†			
Fever requiring antibiotics	0	3	12
Incision wound infection	0	3	16
Pelvic pain/cramps	0	1	1
Spotting from incision wound	0	0	1
Nausea/vomiting	0	0	1
No. of patients with ≥ 1 early complications	0 (0.0%)	4 (2.3%)	24 (4.6%)

* Complications/complaints that occurred during or immediately after the sterilization procedures.
† Complications/complaints that occurred during the 7- to 21-day follow-up.

Table 3. Immediate and Early Complications/Complaints in Tubal Ring Patients

	Postabortion group ($N = 114$)	Intermediate group ($N = 182$)	Interval group ($N = 506$)
Immediate complications/complaints*			
Excessive bleeding not requiring laparotomy	0	0	1
Mild bleeding of mesosalpinx	1	0	3
Subcutaneous/subperitoneal emphysema	1	0	7
Pelvic pain/cramps	2	6	19
No. of patients with ≥ 1 immediate complications	4 (3.5%)	6 (3.3%)	29 (5.7%)
Early complications/complaints†			
Fever requiring antibiotics	1	0	6
Incision wound infection	0	1	2
Pelvic pain/cramps	3	2	8
No. of patients with ≥ 1 early complications	4 (3.5%)	3 (1.7%)	14 (2.8%)

* Complications/complaints that occurred during or immediately after the sterilization procedures.
† Complications/complaints that occurred during the 7- to 21-day follow-up.

weeks' gestation.[3] All subjects included in this study were within 12 weeks' gestation at the time of therapeutic abortion. The 3 groups, subdivided in this study according to the timing of laparoscopic sterlization, were generally comparable in their biologic characteristics such as age, parity, and proportion with obesity. The study subjects were marked with a high incidence of previous induced abortion; more than half of all the subjects had had at least 3 previous induced abortions.

The results revealed that for those undergoing electrocoagulation or tubal ring application, technical problems and major complications were rarely encountered, irrespective of timing of the laparoscopic sterilization procedure. None of those complications that are theoretically more likely to be connected with concurrent pregnancy and/or abortion, such as excessive bleeding and uterine perforation, occurred in the postabortion group. The proportion of patients suffering from 1 or more complications either during the sterilization procedure or at the early follow-up was not significantly higher in patients with the combined abortion–sterilization procedure than in those who were sterilized afterward. Of the total 1604 patients included in the study, no death was reported, and in only 2 patients (both of whom were in the interval group) did the operators fail to complete the procedures. The number of patients who encountered surgical difficulties during the laparoscopy, needed hospitalization after the procedure, or required hospital readmission also was small and not clustered in any 1 of the 3 groups.

Anesthetic methods used during laparoscopic sterilizations were not entirely comparable among the 3 groups. Also, a few patients in the interval group had a concurrent endometrial curettage or aspiration to ensure that there were no luteal phase pregnancies. However, if the comparisons are limited to those patients operated on using local anesthesia, and if patients in the interval group who underwent a concurrent endometrial check are eliminated, the general findings do not change.

One previous study[4] has documented that patients undergoing laparoscopic sterilization combined with therapeutic abortion did not have a significantly higher complication rate than patients undergoing therapeutic abortion alone. In this study, the authors have shown that patients undergoing laparoscopic sterilization combined with therapeutic abortion did not have significantly higher rates of complications and/or technical problems than patients undergoing sterilization some time after therapeutic abortion.

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