

Tubal sterilization by laparoscopy and mini-laparotomy

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Abstract

Laparoscopic tubal sterilization was performed on 179 women using general anesthesia, and tubal sterilization via mini-laparotomy was performed in 52 cases using local anesthesia. The patients ranged in age from 25 to 41 years, with 73.2% between 31 and 40 years. The mean operative time of laparoscopy and mini-laparotomy were 14.2 and 11.6 minutes, respectively. Both the laparoscopy group and the mini-laparotomy group were found to be similar with regard to age, gravidity and number of abortions. Pelvic inflammatory disease (PID) was not observed in any patient during the follow-up period (3 months). Two wound infections were detected within the first week following mini-laparotomy, and these were treated on an out-patient basis by relevant antibiotics. Among the 179 patients in whom laparoscopic tubal sterilization was performed, tubal rupture occurred in 3 cases (1.67%) which were electrocoagulated easily, and unplanned laparotomy was performed in a patient in whom bowel injury during mini-laparotomy was suspected.

Introduction

Tubal sterilization is the most popular method of contraception worldwide especially for those who have completed their family [1]. The procedure can be accomplished by several surgical methods. With the improvement of laparoscopic equipment and fiberoptics in the late 1960s, laparoscopic tubal sterilization has gained wide acceptance because it can be performed easily and economically with a short hospital stay and fast recovery.

Laparoscopic tubal sterilization using electrocautery is the method used most widely; however, with the introduction of rings and clips in the 1970s, occlusive techniques which are safer and more effective than cauterization [2] are also becoming commonly used methods of laparoscopic tubal sterilization [3].

On the other hand, tubal sterilization via mini-laparotomy does not require sophisticated and expensive endoscopic equipment and rarely needs general anesthesia, thereby reducing the cost.

This report reviews the authors' experience in 179 cases of laparoscopic tubal sterilization and 52 cases of tubal sterilization via mini-laparotomy.

Materials and methods

From January to June 1992, 231 women requesting tubal sterilization were enrolled in a study at Dr. Zekai Tahir Burak Women's Hospital, Family Planning Clinic, Ankara, Turkey. All participants signed an informed consent form and were interviewed with a standard questionnaire, followed by physical and gynecologic examination.

Laparoscopic tubal sterilization was performed on 179 women under general anesthesia after giving them preoperative medication (pethidine HCl 100 mg IV, antazoline 25 mg IV, atropine sulphate 25 mg IV) one hour before surgery. General anesthesia was induced by IV administered pentothal sodium followed by inhalation of a mixture of dinitros oxide and oxygen. A muscle relaxant (succinylcholine iodine) was administered during the procedure. Tubal sterilizations were performed by laparoscopic application of silastic rings. Thirty-five of 179 women had an IUD-removal combined with the procedure and received prophylactic antibiotics.

In patients with systemic disease preventing general anesthesia, post-partum tubal sterilization mini-laparotomy was performed. Patients with the history of pelvic or abdominal surgery and those with the history of pelvic infection, were not scheduled for mini-laparotomy. Post-partum tubal sterilizations were also performed by mini-laparotomy. Tubal sterilization via mini-laparotomy was performed in 52 cases using local anesthesia. After the same premedication as was described above, the supra-pubic region (2 cm above from symphysis pubis) was infiltrated with a local anesthetic (lidocaine HCl 2%, 20 cc) and a transverse incision was made not exceeding 3 cm in length. After spraying the local anesthetic onto each tube, tubal sterilization was performed by using the Pomeroy technique. Post-partum tubal sterilizations were performed through a sub-umbilical vertical incision (2 cm below) in the same manner described above.

The mean operative times for laparoscopy and mini-laparotomy were 14.2 and 11.6 minutes, respectively. After the operations, all patients, except the one who underwent unplanned laparotomy, were transferred to the recovery room where they were observed for a while. The duration of stay in the recovery room varied from 2 to 6 hours and the mean time was 3.2 hours. The patients were discharged to home with a prescription for analgesics. They were advised to contact us if they faced any problem.

Results

The patients ranged in age from 25 to 41 years, with 73.2% between 31 and 40 years. The gravidity and number of abortions ranged from zero to 5; the majority (77.5%) of the patients were in '5 or more' group (gravidity) and 39.8% of the patients were in '1 or 2-abortion' group. Both the laparoscopy group and the mini-laparotomy group

Table 1. Distribution of patients in the laparoscopy and mini-laparotomy groups with regard to age, gravidity and number of abortions

	<i>Laparoscopy</i>	<i>Mini-laparotomy</i>
<i>Age</i>		
<25	3	1
26-30	24	12
31-35	62	24
36-40	68	15
>40	22	0
<i>Gravidity</i>		
Nil	0	0
1 or 2	6	1
3 or 4	37	8
>4	136	43
<i>No. of abortions</i>		
Nil	34	10
1 or 2	71	21
3 or 4	40	13
>4	34	8

were found to be similar with regard to age, gravidity and number of abortions (Table 1).

Forty-seven patients had tubal sterilizations combined with the removal of their IUD. Of these, 35 underwent laparoscopic tubal sterilization and the remaining 12 underwent tubal sterilization via mini-laparotomy. These patients received prophylactic antibiotics (doxycycline 200 mg) one hour before the procedure and daily thereafter for 2 days.

PID was not observed in any patient during the follow-up period (3 months). However, two patients experienced fever not exceeding 38°C within the 3 days with duration of 1 to 2 days. All were in the laparoscopy group and only one of them underwent removal of an IUD combined with the procedure. We did not consider these occasions febrile complications of the procedure. Two wound infections detected within the first week following mini-laparotomy were treated on an out-patient basis by relevant antibiotics.

Among the 179 patients in whom laparoscopic tubal sterilization was performed, tubal rupture occurred in 3 cases (1.67%) and were electrocoagulated easily. However, unplanned laparotomy was performed to a patient in whom bowel injury during mini-laparotomy was suspected. She was a 27-year-old woman with an unremarkable history. At laparotomy, a tear (1 cm in length) at the serosa of the ileum was observed and was repaired by interrupted sutures. She was discharged after 5 days of hospitalization. No other complications occurred during the procedures.

Discussion

Technical failure is defined as inability to complete the procedure as intended. In our study the technical failure rate of laparoscopic sterilization was found to be 1.67%. This technical failure rate is lower than the 2.02% that Baggish *et al.* [4] found in 5346 cases; however, in the same study the technical failure rate was found to be 0.83% in 846 cases in which silastic rings were used; this was lower than our technical failure rate. Poindexter *et al.* [5] in 1990, reported a technical failure rate of 0.14% in 2827 cases of laparoscopic tubal sterilization with the silastic rings. Most of the other collaborative studies recorded a technical failure rate not exceeding 1% when either laparoscopic electrocauterization or silastic ring application was used [1,6–8].

No wound infection occurred in the laparoscopic group. Loffer [9], in 1980, reported an incidence of 0.03% wound infection in cases in whom laparoscopic procedures were performed. However, in our study two wound infections were observed in the mini-laparotomy group with an incidence of 3.9%; this was higher than expected.

The association of IUD contraception and PID has been well established [10,11] and it is therefore reasonable to expect the development of PID in IUD users in whom IUD removal and tubal sterilization are combined. Beerthuizen *et al.* [11], in 1982, reported pathomorphologic changes showing various degrees of salpingitis in the oviducts in cases who underwent voluntary sterilization via posterior colpotomy with the history of IUD contraception. Seiler [12], in 1986, postulated that cauterization of the fallopian tubes may prevent clinical infection even if histopathological salpingitis is present. Although silastic ring application via laparoscopy was used in the present study, we did not find PID in any patient. Prophylactic antibiotic use probably prevented clinical infection in 47 cases in whom IUD removal was combined with sterilization.

Several factors, such as obesity, previous pelvic or abdominal surgery, and pelvic infections have been considered to be the risk factors that may lead to unplanned laparotomy. However, in a case without any predisposing factor, unplanned laparotomy was performed because of suspected bowel injury during tubal sterilization via mini-laparotomy. We believe this happened because of the operator's inexperience.

The rationale for our approach is to decrease the mortality and morbidity of tubal sterilization that have been associated with use of general anesthesia. Studies concerning the mortality associated with laparoscopic tubal sterilization have found cardiorespiratory complications to be the leading causes of death during general anesthesia [13,14]. On the other hand, local anesthesia is safer in combination with sedation, which is a major step in eliminating complications. No complication due to anesthesia occurred in our study group.

We conclude that both laparoscopic tubal sterilization and tubal sterilization via mini-laparotomy are safe procedures if they are combined with appropriate selection of patients for the type of anesthesia and the type of technique.

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Resumé

La stérilisation laparoscopique des trompes a été réalisée chez 179 femmes sous anesthésie générale et la stérilisation des trompes par mini-laparotomie dans 52 cas sous anesthésie locale. L'âge des patientes se situait entre 25 et 41 ans et pour 73,2% entre 31 et 40 ans. L'opération a duré en moyenne 14,2 minutes avec la laparoscopie et 11,6 minutes pour la mini-laparotomie. Les femmes des deux groupes présentaient des caractéristiques similaires quant à l'âge, l'état de gestation et le nombre d'avortements. Aucune patiente n'a manifesté d'inflammation pelvienne au cours de la période de suivi (3 mois). Deux cas d'infection de la plaie ont été constatés au cours de la première semaine qui a suivi la mini-laparotomie. Cette infection a été traitée par des antibiotiques appropriés, sans hospitalisation. Parmi les 179 patientes stérilisées par laparoscopie tubaire, il s'est produit 3 cas de rupture des trompes (1,67%), qu'il a été facile de traiter par électro-coagulation. Une laparotomie qui n'avait pas été prévue a été réalisée sur une patiente chez qui on suspectait une atteinte de l'intestin au cours d'une mini-laparotomie.

Resumen

Se practicó una esterilización de las trompas mediante laparoscopia en 179 mujeres con anestesia total, y en 52 casos la esterilización de las trompas se practicó mediante minilaparotomía con anestesia local. La edad de las pacientes fluctuaba de 25 a 41 años, siendo el 73.2% de edad comprendida entre los 31 y 40 años. El tiempo quirúrgico medio de la laparoscopia y minilaparotomía fue 14.2 y 11.6 minutos, respectivamente. Se comprobó que tanto el grupo laparoscopia como el de minilaparotomía eran

similares en cuanto a edad, gravidez y número de abortos. No se observó enfermedad pélvica inflamatoria (EPI) en ninguna paciente durante el período de seguimiento (3 meses). Se detectaron dos infecciones de la herida durante la primera semana posterior a la minilaparotomía, que fueron tratadas en consultorio externo mediante los antibióticos correspondientes. Entre las 179 pacientes a las que se practicó esterilización de las trompas mediante laparoscopia, se registraron 3 casos (1.67%) de ruptura de trompas, que fueron electrocoaguladas con facilidad, y se practicó una laparotomía no prevista en una paciente en la que se sospechó la existencia de una lesión intestinal durante la minilaparotomía.