

## Research Article

# Uterine Manipulation During Laparoscopic Sterilization- Can we do without it?

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## Abstract

**Study Objective:** To compare complication rates, operative times and costs of laparoscopic tubal sterilization performed without and with uterine manipulation.

**Design:** Retrospective case control analysis of patients who underwent Laparoscopic Tubal Sterilization (LTS).

**Setting:** Bronx Lebanon Hospital Center- a community based teaching hospital, Bronx, New York, USA.

**Patients:** 164 patients who had LTS performed January, 2005 -January, 2013.

**Intervention:** Uterine manipulation to move the uterus during abdominal surgery is a common practice in LTS. Manipulators in our institution include HUMI (Harris-Kronner uterine manipulator injector), uterine manipulator, hulka manipulator, tenaculum with cervical dilator and ring forceps with sponge. Our study compares the outcomes of LTS performed without uterine manipulation compared to LTS with uterine manipulation.

**Measurements and Main Results:** 82 cases of LTS (50%) were performed without uterine manipulation (Group 1), and 82 cases of LTS (50%) with uterine manipulation (Group 2). The groups were matched for Cesarean Sections and general abdominal surgeries. All patients were observed appropriately and discharged the same day of surgery. 1 case in Group 1 required overnight admission for observation after extensive intraoperative adhesiolysis. The average time of LTS surgery was 38.6 (range 20 – 180) minutes in Group 1 and 42.5 (range 12-120) minutes in Group 2. Total numbers of complications in Group 1 were 2 and in Group 2 were 3.

**Conclusions:** Performance of LTS without uterine manipulation from the vagina is a safe alternative for patients desiring LTS. History of previous abdominal surgeries is not a contraindication to performing LTS without manipulation.

**Keywords:** Laparoscopic; Tubal; Sterilization

## Abbreviations

LTS: Laparoscopic Tubal Sterilization; HUMI: Harris-Kronner Uterine Manipulator Injector

## Introduction

Female sterilization is the most widely used method of contraception in the world and in the United States of America [1] of which laparoscopic tubal sterilization is the preferred method. It is a safe and effective method (annual failure rate of 0.55 at year 1 and 0.13 at year 5 of use [2]) of preventing unintended pregnancies, since such pregnancies are associated with substantial adverse health, social and economic consequences. LTS has been performed in many different ways, of which bipolar cauterization of the Fallopian tube is a commonly performed procedure [3]. This procedure includes manipulation of the uterus by insertion of a cervico-uterine instrument. We conducted a retrospective case-control analysis of this method of LTS, without and with uterine manipulation in order

to determine whether LTS without uterine manipulation was a safe and cost-effective technique.

## Materials and Methods

This study includes 164 women between the ages of 23 and 48 years who underwent laparoscopic sterilization from January, 2005 to January, 2013 at the Bronx Lebanon Hospital, New York, USA.

The patients who underwent LTS without uterine manipulation were matched in terms of age and parity with those that had the procedure without uterine manipulation. (Case control analysis)

## Results

The age range of the patients was 26-46 years in Group 1 with a Median of 36 years and 23-48 years with a median of 35.5 years in Group 2. The parity had a Range of 1-5 (median 3) in Group 1 and a Range of 1-6 (median 3.5) in Group 2. In Group 1, 16 had previous general abdominal and 26 patients had >1 Cesarean Sections. In Group

Table 1: Sample Text.

	With Uterine manipulation	Without uterine manipulation
Number of patients	82 (50%)	82 (50%)
Manipulators	<ul style="list-style-type: none"> <li>• HUMI Uterine manipulator</li> <li>• Hulka manipulator</li> <li>• Tenaculum with cervical dilator</li> <li>• Ring forceps with sponge</li> </ul>	None
Operative time	12 minutes - 120 minutes	20 minutes - 180 minutes. (180 minutes in case of a bowel injury which was repaired laparoscopically)
Average surgery time	42.5 minutes	38.6 minutes
Complications	3 complications <ul style="list-style-type: none"> <li>• Bleeding from the tenaculum site controlled with cauterization</li> <li>• Ovarian dermoid cyst rupture leading to ovarian cystectomy</li> <li>• Uterine perforation by HUMI managed by laparoscopic cauterization of perforation site.</li> </ul>	2 complications <ul style="list-style-type: none"> <li>• Hematoma noted at the 5 mm entry port controlled with electrical cauterization</li> <li>• Small bowel injury noted after entry, treated laparoscopically</li> </ul>
History of previous abdominal surgeries (minimal to dense adhesions)	16	16
Discharge day	Same day except overnight observation in 1 case with extensive intraoperative adhesiolysis	Same day

2 16, had a history of previous abdominal surgery and 18 patients had had >1 Cesarean Sections. The average time of LTS surgery was 38.6 (range 20 – 180) minutes in Group 1 and 42.5 (range 12-120) minutes in Group 2. 1 case in Group 1 required overnight admission for observation after extensive intraoperative adhesiolysis. Total number of complications in Group 1 was 2 and in Group 2 were 3. Complications in Group 1 were: 1 hematoma noted at the 5 mm entry port controlled with electrical cauterization, and 1 small bowel injury noted after entry (treated laparoscopically). Complications noted in Group 2 were: 1 case of bleeding from the tenaculum site (controlled with cauterization), 1 case of ovarian dermoid cyst rupture leading to cystectomy, 1 case of uterine perforation (managed by laparoscopic cauterization of perforation site). There were no cases of conversion to Laparotomy in either group.

## Discussion

LTS is a safe, highly effective, permanent, and convenient form of contraception. Numerous methods for achieving permanent sterilization have been described, and subsequently modified to improve success rates, simplify surgical technique and reduce postoperative pain and length of hospital stay. LTS techniques are preferred for most patients, as they are effective, are usually performed on an outpatient basis, and result in rapid patient recovery [4]. LTS is the most common surgical method for interval sterilization, i.e. sterilization performed outside the post-partum period. Advantages include the opportunity to visually explore the abdomen for occult disease, a small incision, and rapid recovery [5]. A review of U.S. health care literature using a MEDLINE search, bibliographies of key references, and U.S. government publications has not demonstrated any studies of LTS with and without uterine manipulation. The only article published was from an international journal of obstetrics and gynecology by a single Indian operator that reported 16,803 cases from 1980 to 1981 which reported that the surgery could be performed safely without uterine manipulation [6]. For most LTS procedures, the female patient are placed in the lithotomy position, the bladder emptied, and a speculum inserted into the vagina. The cervix is cleaned with povidone-iodine solution. A uterine

manipulator is inserted into the uterine cavity. This study shows that LTS without manipulation from the vagina is associated with a reduction in the rate of complications and the overall cost of surgery. Complications attributable to the use of uterine manipulators include cervical lacerations, uterine perforation, and laceration of uterine vessels, retroperitoneal or intraperitoneal bleeding, and perforation of the bowel, rectum or bladder, ascending infection, interruption of unsuspected intrauterine pregnancy and retention of part of the manipulator as a foreign body. [4] Uterine perforation can be assessed laparoscopically and usually requires no intervention, as the bleeding typically stops on its own. If uterine bleeding is concerning, it can be addressed by pressure and time, cauterization, or suture ligation. The cervix should be inspected upon removal of the uterine manipulator. Cervical bleeding can be addressed with pressure, silver nitrate, Monsel solution, or suture (if heavy bleeding is seen). 2 of the complications noted in the group with uterine manipulation were related to the placement of the manipulator itself resulting in uterine perforation by the HUMI and bleeding from the tenaculum site. Cost of the uterine manipulator is another important factor. Manipulators used in this study were- HUMI (Harris-Kronner uterine manipulator injector), uterine manipulator, hulka manipulator, tenaculum with cervical dilator and ring forceps with sponge. The information of the cost of the manipulators was searched in the product catalogs of several medical equipment distributors and suppliers. The average cost of the HUMI is \$35. The cost for the Hulka averages \$125. The United States Federal government funds sterilization procedures and the typical annualized cost to the system is \$2912 [7]. Thus cost reduction without a compromise in safety of a procedure is an important aspect of treatment. One limitation of this study is that it is a retrospective case control analysis based on the study of operative reports. A randomized controlled trial would require training of all the gynecologists in the participating teams to perform LTS without uterine manipulation. In the absence of this type of trial, observational studies such as this are useful for comparative effectiveness. Our results should encourage gynecologists to consider LTS without uterine manipulation after appropriate training. In view of the available data, it certainly seems a reasonable and safe alternative.

## Conclusion

Performance of LTS without any uterine manipulation from vagina is a safe alternative for patients desiring LTS. It has the added advantage of cost savings for the manipulator. History of previous abdominal surgeries is not a contraindication to performing LTS without manipulation.

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