

Total Laparoscopic Hysterectomy Using the Harmonic Scalpel

Marc L. Winter, MD, Susan A. Mendelsohn, MD

ABSTRACT

Total laparoscopic hysterectomy (TLH) is the complete hysterectomy including transection of the uterine vessels and opening/closure of the vaginal vault performed laparoscopically. This procedure can be performed as an alternative to total abdominal hysterectomy in many cases. We previously found use of the harmonic scalpel to be extremely helpful in performing laparoscopically assisted vaginal hysterectomies. In this series, the harmonic scalpel was used to facilitate performing TLH. Our experience has shown this can be performed without major complications in a cost-effective manner.

Key Words: Laparoscopy, Laparoscopic hysterectomy, Harmonic scalpel.

INTRODUCTION

Hysterectomy is the fourth most common in-patient operation in the United States. About two-thirds of all hysterectomies are still performed abdominally. Over the last ten years, gynecologists have been obtaining the necessary skills to perform laparoscopically assisted vaginal hysterectomies (LAVH) or total laparoscopic hysterectomies (TLH) in order to convert an abdominal procedure into a laparoscopic/vaginal procedure. Similar to vaginal hysterectomy, LAVH and TLH have a shorter hospital stay, less painful recovery, and a quicker return to normal activity relative to an abdominal procedure.¹⁻³

We have attempted to adopt techniques which assist in making LAVH and TLH easier, more cost-effective, expeditious, and safer to perform.

Since May 1998, we have been performing total laparoscopic hysterectomy using the harmonic scalpel as the sole coagulation and cutting device, including transection of the uterine vessels and opening of the vagina. The harmonic scalpel has provided a cost-reduction by limiting instrumentation and increasing speed of the procedure. This one instrument is used to achieve hemostasis and transect tissue. It provides a high degree of safety by heating tissue to form a protein coagulum, which gives excellent hemostasis at a significantly lower temperature than standard electrosurgery, thus decreasing the risk of thermal injury to surrounding tissue.

We began performing total laparoscopic hysterectomies to maximize vaginal length, preserve the entire uterosacral ligaments for better long-term vaginal support, and decrease operating room time relative to LAVH.

MATERIALS AND METHODS

Twenty-six TLH cases were attempted between May and December 1998. Instrumentation used to facilitate this TLH procedure included the Laparoscopic Coagulating Shears (LCS) attachment to the harmonic scalpel (Ethicon, Cincinnati, OH). The 10 cm LCS was used during the first half of our series, after which we converted to the 5 cm LCS. This allowed us to use two secondary 5 mm ports in addition to the umbilical 10 mm port. In

Address reprint request to: Marc L. Winter, MD, Orange Coast Women's Medical Group, 24411 Health Center Drive, Suite 200, Laguna Hills CA 92653. Telephone: (949) 829-5500, Fax: (949) 829-5529, E-mail: mwinter@memorialcare.org

addition, we used the Rumi system uterine manipulator, Koh Cup Vaginal Fornices Delineator, Colpo-Pneumo Occluder (Cooper Surgical, Shelton, CT).⁴

RESULTS

Twenty-two cases of total laparoscopic hysterectomy using the harmonic scalpel were performed with no major complications. Four cases that began as TLH were converted to LAVH secondary to large fibroids, making dissection of the uterine vessels, mobilization of the uterus, or opening of the vagina difficult laparoscopically.

No increased morbidity was noted in comparison to LAVH, vaginal hysterectomy, or total abdominal hysterectomy performed within the same time period at the same institution. Two patients' status post-TLH were treated with oral antibiotics for mild vaginal cuff cellulitis with rapid resolution.

Average hospital stay was 1.8 days for TLH, 1.9 days for LAVH, 2.3 days for vaginal hysterectomy, and 2.8 days for total abdominal hysterectomy.

DISCUSSION

We have been very satisfied using the LCS attachment to the harmonic scalpel as our main instrumentation in performing TLH. It is safer than standard electrosurgery. By working at significantly lower temperatures (100 C° versus 300 to 400 C°), there is less lateral thermal spread with the harmonic scalpel. The decreased thermal damage to surrounding tissue (relative to electrosurgery) lowers the risk of inadvertent injury to the ureters and bladder. By decreasing the amount of necrosing tissue, the risk of a fistula formation should be theoretically reduced, and there should be less postoperative pain.

Harmonic scalpel is cost-effective relative to the use of staple devices. Staple devices cost an average of \$1,600 per case versus \$325 for harmonic scalpel. Although the harmonic scalpel is more expensive than a reusable bipolar device (by \$325 per case), it saves money by decreasing operative time by an average of 15 to 30 minutes. This is facilitated by decreasing the need for instru-

ment changes and using the bottom of the active harmonic scalpel blade as a cutting device to facilitate colpotomy.

Initially, we had concerns regarding transection of the uterine artery with the harmonic scalpel. We knew from related experience that it could be used to effectively coagulate vessels within the infundibulopelvic ligament as well as gastric arteries. For approximately six months prior to beginning our TLH procedure, we routinely transected the uterine arteries at the time of LAVH. This gave us the opportunity to reassess the uterine pedicles laparoscopically after the procedure was essentially completed. There was no delayed bleeding noted at the uterine pedicles. Approximately 20 cases were performed in this fashion. During our TLH series, we have had no postoperative bleeding problems secondary to using the harmonic scalpel.

The use of bipolar electrocautery has become rarely necessary. Techniques that we have found helpful include careful dissection and skeletonization of the uterine artery and taking enough time during coagulation for hemostasis to occur prior to transection of the artery. This can easily be mastered with laboratory training and by performing the first few cases with an experienced surgeon.

Vaginal hysterectomy is still our preferred procedure, but TLH or LAVH can be used as a substitute for the majority of abdominal hysterectomies. Using the harmonic scalpel has facilitated the technical performance of TLH and can safely be used to perform this procedure.

References:

1. Dorsey JH, Steinberg EP, Holtz DM. *Am J Obstet Gynecol.* 1995;173(5):1452-1460.
2. Olsson JH, Ellstrom M, Hahlin M. *Br J Obstet Gynaecol.* 1996;103(4):345-350.
3. Meikle SF, Nugent EW, Orlear M. *Obstet Gynecol.* 1997;89(2):304-311.
4. Koh, Charles H. A new technique and system for simplifying total laparoscopic hysterectomy. *J Am Assoc Gynecol Laparosc.* 1998;5(2):187-192.