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Original Article

Laparoendoscopic Single-site Myomectomy Versus Conventional Laparoscopic Myomectomy: A Comparison of Surgical Outcomes

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ABSTRACT **Study Objective:** The objective of this study was to evaluate laparoendoscopic single-site myomectomy (LESS-M) for the surgical treatment of fibroids and to compare surgical outcomes and postoperative pain with conventional laparoscopic myomectomy (CLM).

Design: Retrospective study.

Setting: University-based hospital.

Patients: Data were obtained from medical records of patients who underwent LESS-M between August 2011 and June 2012. Considering the surgeon's learning curve for LESS-M, we collected the data after 100 LESS-M procedures were performed. The cases were compared with a historic cohort of patients who underwent CLM performed by the same surgeon between July 2008 and May 2009. A single experienced surgeon performed both procedures in all patients. A total of 118 patients who underwent LESS-M or CLM were included in the study (59 in the LESS-M group and 59 in the CLM group).

Interventions: None.

Measurements and Main Results: We analyzed and compared patient basal characteristics and surgical outcomes between the 2 groups. There were no statistically significant differences in basal characteristics (i.e., age, body mass index, number and size of myomas, and type of the largest myoma) between the 2 groups. The surgical outcomes (i.e., operative time, estimated blood loss, postoperative hemoglobin drop, postoperative hospital stay, and postoperative pain scores) were not different statistically between the 2 groups. Moreover, patients did not experience major intraoperative complications. Postoperative complications were wound infections that occurred in 3 patients (2 in the LESS-M and 1 in the CLM groups).

Conclusion: LESS-M is feasible for less than 5 myomas and offers comparable surgical outcomes with those of CLM after the surgeon's initial learning curve. Journal of Minimally Invasive Gynecology (2014) 21, 775–781 © 2014 AAGL. All rights reserved.

Keywords: Laparoendoscopic single-site surgery; Single port; Laparoscopic myomectomy; Myomectomy; Myoma

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Minimally invasive procedures such as laparoscopic surgery are becoming the current trend and are improving with advances in surgical instrumentation and technique. Laparoscopic myomectomy (LM) was first reported by Semm [1] in 1979. Henceforth, several studies showed that LM has various advantages over the laparotomic and minilaparotomic approaches, including less postoperative hemoglobin drop, shorter hospital stay, and less postoperative pain [2].

Nowadays, laparoendoscopic single-site surgery (LESS) has been applied to various gynecologic operations, and

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many reports describing this technique have been published [3–5]. LESS offers excellent cosmetic results compared with those obtained using conventional multiport laparoscopic surgery [6–8]. However, LESS has not been widely performed because of its technical difficulties such as limited motion and clashing between instruments. Moreover, laparoendoscopic single-site myomectomy (LESS-M) has more difficulties than other LESSs because it requires the tying of multiple sutures and the extraction of relatively large tissue specimens through the umbilical incision. After enucleation of myomas, the repair of uterine wall defects may be challenging for surgeons with limited experience in endoscopic suturing. Difficulties in maintaining adequate tension of the suture line while suturing and knot tying may increase the operative time and intraoperative blood loss [9].

Until now, there have been few reports in the literature about the application of LESS to myomectomy [10–14]. Only 1 study comparing surgical outcomes of LESS-M with those of conventional laparoscopic myomectomy (CLM) has been performed and reported [15]. However, most of the previous studies had small samples. To assess the exact feasibility and safety of LESS for myomectomy, we performed LESS-M with intracorporeal suture tying and morcellation and compared the surgical outcomes and postoperative pain with those of CLM.

Methods

Subjects

This study was approved by the Institutional Review Board of Seoul National University Bundang Hospital, Seongnam, Korea. Data were obtained from medical records of patients who underwent LESS-M between August 2011 and June 2012. Considering the surgeon's learning curve for LESS-M, we collected data after the initial 100 LESS-M procedures were performed.

Medical history questionnaires and pelvic examinations were conducted preoperatively; all patients underwent routine preoperative laboratory studies. Patients were included consecutively if their LESS-M was performed by a single experienced surgeon (J.R.L.) and if they had ≤ 4 myomas on the preoperative pelvic ultrasonography. LESS-M with other combined surgery was excluded. These cases were compared with a historic cohort of 59 consecutive patients who underwent CLM performed by the same surgeon between July 2008 and May 2009. A total of 118 patients who underwent LESS-M or CLM were included in the study (59 in the LESS-M group and 59 in the CLM group).

We experienced 1 conversion to multiport surgery (1 additional 5-mm trocar) from LESS-M and 1 conversion to laparotomy from CLM. Both of the conversions were caused by the presence of severe pelvic adhesions because of previous pelvic surgery. In the CLM case, after confirming adhesion with a laparoscope through the umbilical incision, we performed conversion immediately without a second insertion of a trocar. We excluded these 2 conversion cases from this analysis.

Operative Techniques

The operative procedures were not different between the 2 groups with the exception of port placement, laparoscope, and the devices used for suture tying. After sterilization of the skin and draping of the patient, a uterine manipulator (Rumi System; Cooper Surgical, Trumbull, CT) was inserted into the uterine cavity. For LESS-M, single-port entry was established using a wound retractor (Alexis Wound Retractor XS; Applied Medical, Santa Margarita, CA) and a surgical glove. With the open Hasson technique, a vertical incision of 1.5 to 2 cm was made within the umbilicus, and a wound retractor was inserted into the incision. Two 5-mm trocars and one 12-mm trocar were inserted through the first, third, and fifth fingers of the surgical glove and fixed with silk ligatures; then, the glove was draped around the outer ring of the wound retractor (Fig. 1). A 12-mm trocar was inserted into the glove finger on the operator's side and was then used for 10-mm devices, such as the myoma screw. A flexible 30° laparoscope was used and inserted through the 5-mm trocar on the assistant's side. Most procedures were performed using conventional rigid laparoscopic instruments, and an articulating device (Autonomy Laparo-Angle; Cambridge Endo, Framingham, MA) was used for intracorporeal suture tying.

When surgical preparation was completed, about 10 mL of a solution containing 6 IU (0.3 mL) vasoconstrictor agent (Vasopressin; Hanlim Pharma, Seoul, Korea) and 9.7 mL normal saline was injected into the tissue adjacent to the base and the capsule of the uterine myoma. The incision was made vertically to the myometrium using monopolar scissors or an ultrasonic cutting device (Harmonic Scalpel; Ethicon Endo-Surgery, Cincinnati, OH) and deepened until the myoma surface appeared. Myoma enucleation was performed with traction using a 10-mm myoma screw or claw forceps; the separation of the capsule from the myoma was achieved using 5-mm forceps. After enucleation of myomas, the uterine muscle was closed using either a 1- or 2-layer interrupted suturing technique (Fig. 2). Intracorporeal suture tying was performed using conventional and articulating laparoscopic instruments. The long end of the thread wrapped around the bent articulating device, and the short end was pulled through with the articulating device (Fig. 3). This suture technique is actually the same as the one used for conventional laparoscopic surgery consisting of a triangulation made by the vertically bent device tip. After repair of the myometrium was completed, enucleated myomas were extracted through the umbilical incision using a 15-mm electromechanical morcellator (X-Tract; Ethicon Inc., Somerville, NJ), which was inserted through 1 free finger of the surgical glove. After irrigation with normal saline, an adhesion barrier (Interceed; Ethicon Inc., or Guardix;