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Short communication

A novel modification of two-port laparoscopic ovarian cystectomy using a needlescopic instrument: One surgeon's initial experience

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ABSTRACT

Background: Laparoendoscopic single-site surgery (LESS) is challenging even for an experienced laparoscopic surgeon. With the increasing application of LESS for ovarian cystectomy, there is an urgent need to improve and modify the surgical techniques.

Method: We propose a modification of LESS with needlescopic surgery (LESS plus one puncture) as a way of improving the esthetic result and postoperative quality of life of the patient while causing less stress for the surgeon.

Result: We retrospectively reviewed the medical records of the first 30 consecutive patients who underwent two-port surgery for teratoma resection.

Conclusion: LESS plus one puncture for ovarian cystectomy appears as safe and feasible as conventional laparoscopic surgery and can allow for an almost “scarless” cosmetic result.

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Introduction

Laparoscopic surgery for benign gynecological diseases has become a standard surgical procedure all over the world. At present, various techniques have been developed to further minimize the invasiveness of laparoscopic surgery, such as single incision laparoscopic surgery¹ and robotic surgery² in the gynecologic fields.

In laparoendoscopic single-site surgery (LESS), a 2-cm vertical incision is made within the umbilicus. The size of the incision is more suitable for withdrawing the adnexal tumor compared with conventional laparoscopic surgery, in which the specimen is extracted from the 1-cm incision in the umbilicus. We consider that this will also decrease the stress for surgeons because of the reduction in withdrawal time. However, during LESS we encounter some technical difficulties such as conflict among instruments or

lack of sufficient manipulation angle between instruments, which can potentially compromise the quality and safety of the operation.^{3,4}

We consider LESS to be especially suitable for young females as it improves the esthetic outcome, and ovarian cystectomy is the most frequently performed operation in young women. Therefore, we made it our goal to perform LESS for ovarian cystectomy without any compromise compared to conventional laparoscopic surgery. However, Song et al⁵ reported that the oophorectomy procedure has a learning process that is distinct from the cystectomy procedure. In LESS, all instruments are in-line, which causes crowding of instruments and lack of viewing angles. It also leads to low grasping power.⁵ Therefore, we decided that by adding the needlescopic instrument to LESS, it is possible to maintain a safety standard equivalent to that of conventional laparoscopic surgery without losing the cosmetic benefits of LESS. Here, we present our initial experience with 30 patients who underwent two-port laparoscopic surgery using a needlescopic instrument for ovarian cystectomy limited to teratoma, and assess the safety and feasibility of the procedure.

Conflicts of interest: The authors declare no conflicts of interest.

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Materials and methods

We retrospectively reviewed the medical records of the first 30 consecutive patients who underwent two-port surgery for teratoma resection at Kawasaki Municipal Ida hospital, Kawasaki City, Japan, between November 2011 and May 2012. Our retrospective chart review was approved by the Institutional Review Board. All procedures were performed by a single laparoscopic surgeon (S.A.).

We analyzed each patient's age, body mass index, and the size of the tumor based on magnetic resonance imaging findings. We also investigated operative time, withdrawal time of tumor, estimated blood loss, lengths of hospital stay, and presence of rupture of tumor. All patients suspected of having malignancy based on magnetic resonance imaging were excluded from this study. Prior to the procedures, all patients were fully informed of the characteristics of this surgical procedure and the possibility of requiring conversion to conventional laparoscopic surgery if required.

Two-port laparoscopic ovarian cystectomy using a needlescopic instrument was performed with the patient under general endotracheal anesthesia and epidural catheter insertion. They were placed in a low Trendelenburg position using a lithotomy positioning device with an intermittent pneumatic compression device. The patients' arms were placed at their sides to secure the surgeon's working space. The bladder was emptied with an indwelling Foley catheter. All patients were preoperatively given 1 g of cephazolin intravenously.

The surgeon stood at the opposite side of the ovarian cyst. A 2-cm vertical incision was made within the umbilicus with the open Hasson technique to gain access to the abdominal cavity. Surgical procedure was performed with a single trocar (LAPPROTECTOR and EZ ACCESS; Hakko Medical Co., Nagano, Japan) inserted in the umbilicus. EZ ACCESS is a silicon rubber cap that is designed for the LAPPROTECTOR to create a tight seal, and was originally introduced for LESS. As the EZ ACCESS device has no fixed channel, surgeons can select the best trocar placement to maintain maximum trocar separation for each surgery. This new device consists of three components: the introducer, the fixing valve, and the trocar itself. A rigid 30°, 5-mm laparoscope (Karl Storz GmbH, Tuttlingen, Germany) was introduced, and the entire abdominal cavity was inspected. After pelvic and abdominal exploration, the adnexa were mobilized to perform the stripping technique for the excision of the cysts. An incision was made through the cortex and enucleated cyst from the ovary with blunt and sharp dissection. During the procedure, a separate 2-mm stab incision was made medial to the anterior–superior iliac spine of the tumor side, which is low enough to be covered with pubic hair, and a Mini-Lap Alligator grasper (Mini-Lap Technologies Inc., Stryker Dobbs Ferry, NY, USA) was inserted (Figure 1A). This instrument grasped the cortex, and this gave better retraction that resulted in a better surgical procedure (Figure 1B). The enucleated ovarian teratoma was put into a retrieval bag (EZ Purse; Hakko, Japan) and removed through the EZ ACCESS after draining the cystic contents and cutting the tumor tissue into small pieces in the retrieval bag.

The abdominal cavity was inspected for residual tumor contents and hemostasis. The EZ ACCESS was removed, and the umbilical fascia was closed using 2–0 delayed-absorbable sutures. The umbilical subcutaneous tissue was approximated with 4–0 delayed-absorbable sutures (Figure 1C). At the end of the procedure, blood loss during surgery was estimated by measuring the volume of intraoperative suction, then subtracting the volume of liquid used for intraperitoneal washing. The pelvis was irrigated with lactated Ringer's solution until all evidence of sebaceous material was removed.

For statistical tests, we used Kolmogorov–Smirnov test, and results were assessed with SPSS version 18.0 software (SPSS Inc.,

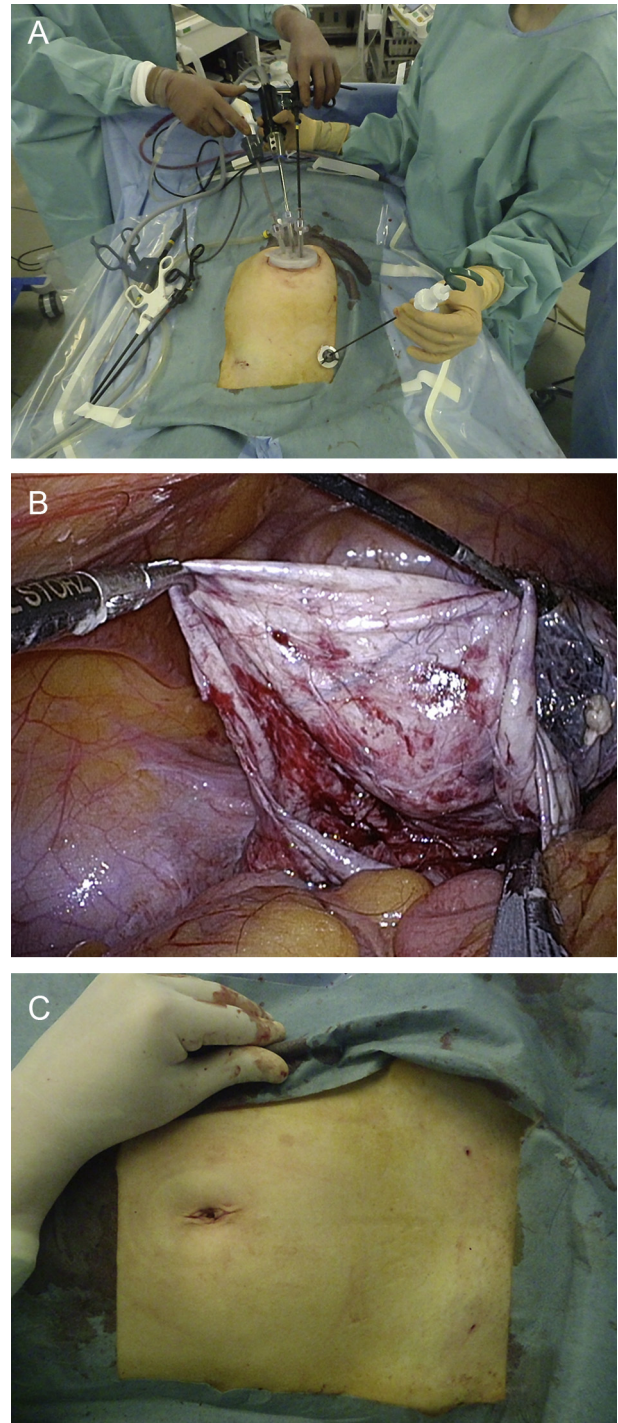


Figure 1. (A) Positioning of single-port systems and the needlescopic grasper. (B) The cortex of ovary is grasped by the needlescopic grasper, and this led to a better surgical procedure. (C) Postoperative photographs of skin incision in a patient who underwent bilateral cystectomy.

Chicago, IL, USA) and statistically analyzed. Because variables in the present study were not normally distributed, results are expressed as median.

Results

All patients successfully underwent two-port laparoscopic ovarian cystectomy without an additional skin incision or

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