



Case report

Rectal injury associated with insertion of a vaginal delineator tube during total laparoscopic hysterectomy: A case report and review of the literature

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ABSTRACT

We present a case of rectal injury during total laparoscopic hysterectomy (TLH) associated with placement of a vaginal delineator tube. The patient was a 43-year-old virgin woman who presented with hypermenorrhea secondary to a large submucosal leiomyoma and underwent TLH. On insertion of a vaginal delineator tube, the boundary between the posterior vaginal fornix and the rectum was misjudged and the rectum was cut. The patient subsequently required transvaginal repair and a temporary ileostomy. With more widespread use of a vaginal delineator tube in TLH, sharing this rare experience with our colleagues will minimize such a complication.

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Introduction

A Cochrane database review in 2006 showed that total laparoscopic hysterectomy (TLH) is preferred to abdominal hysterectomy (AH) for benign gynecological disease.¹ Laparoscopic hysterectomy techniques have been associated with a generally higher rate of complications compared with vaginal hysterectomy and AH. Indeed, a general disadvantage with all laparoscopic surgical procedures is the need for intensified training and education of surgeons, with a learning curve of at least 20–40 operations per surgeon to reduce the complication rates.² The most frequent complications of TLH are bladder injuries, due to sharp dissection in the vesicocervical space and thermal injury in the region of the distal ureter.³ The prevalence of bowel injuries occurring during gynecological laparoscopy was 0.33%.⁴ Only a few reports have been published on bowel injury associated with TLH.^{5,6} Bowel

injuries essentially occur during insertion of trocars, but also during dissection. In this report, we describe the first case of rectal injury associated with insertion of a vaginal delineator tube.

Case report

A 43-year-old woman sought medical advice for hypermenorrhea and anemia with a hemoglobin level of 6.3 g/dL. The patient was a virgin with no prior surgical history. Vaginal examination with a small-sized speculum was easily performed. Hysteroscopic and sonographic examinations revealed a submucosal fibroid of 6 cm in diameter. TLH, but not transcervical resection, was selected for the removal of the fibroid because of its large size. After the anemia was corrected, TLH was performed under general anesthesia. A uterine manipulator was inserted into the uterine cavity for effective control of the position of the uterus. The operation proceeded uneventfully until the cardinal ligament was dissected. Then, a vaginal delineator tube with a diameter of 23 mm (VAGI pipe; Hakko Medical, Tokyo, Japan) was placed in the vagina to outline the cervicovaginal junction circumferentially. During the initial attempt of tube insertion, the tip of the tube did not pass smoothly into the vagina, presumably related to the patient's virginity. Therefore, we performed mediolateral episiotomy, which

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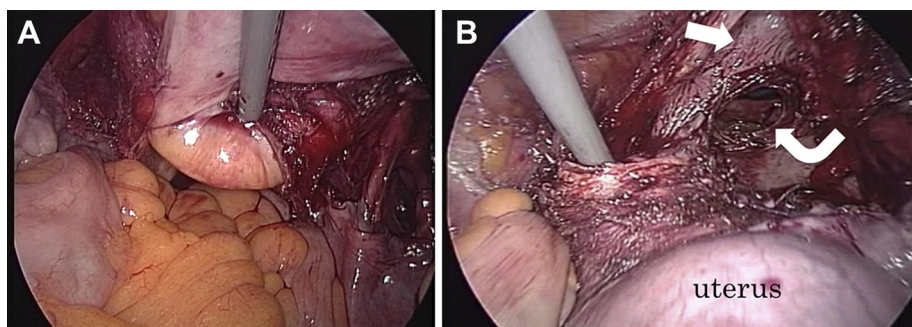


Fig. 1. (A) Intraoperative figure of recto-vaginal fossa before resection; (B) resection of the rectum (curved arrow) and vagina (arrow). The size of the laceration was 4 cm in length.

facilitated the insertion of the tube vaginally without notable resistance. Then, with a monopolar blade, we incised what appeared to be the posterior fornix (Fig. 1A), but which later proved to be the anterior wall of the rectum (Fig. 1B). At this point, we decided to convert to laparotomy. After the uterus was removed, an ileostomy was placed. Transvaginal repair of the anterior rectal wall was performed by two-layer closure with 4-0 delayed-absorbable sutures and the vaginal wall was approximated with 3-0 delayed-absorbable sutures. Her subsequent postoperative course was unremarkable, and she was discharged home on the 13th post-operative day. Two months later, she underwent ileostomy closure and made a satisfactory recovery without vaginorectal problems.

Discussion

Given the macroscopic findings and the preceding operative steps, the insertion of a vaginal delineator tube caused the misjudgment of the boundary between the posterior vaginal fornix and the rectum in our case (Fig. 2). Perforation of the rectum is a potentially serious, albeit infrequent, complication of gynecologic laparoscopic surgery.⁴ Most of these types of complications have been associated with deep-infiltrated endometriosis and thermal injuries. This case was the first reported case of a perforated rectum associated with vaginal delineator insertion.

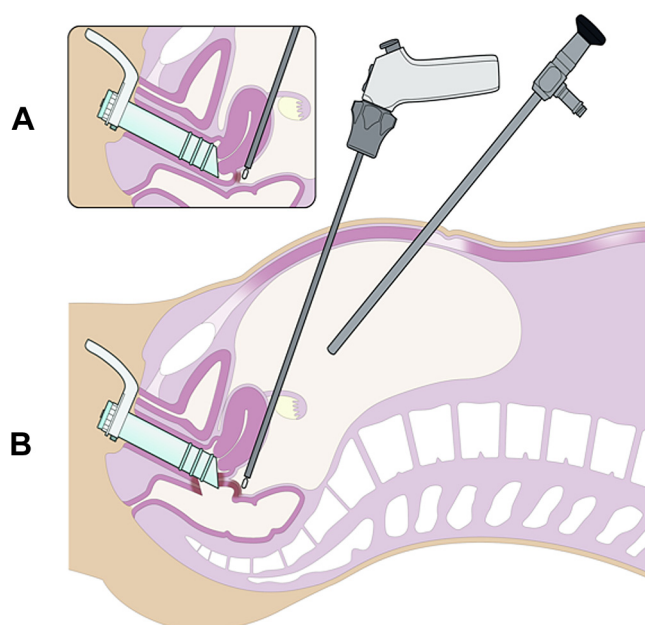


Fig. 2. (A) Normal line of resection; (B) the line of resection in this case.

Compared with conventional hysterectomy, TLH requires specific consideration for safe and efficient completion of the operation. Various devices such as uterine sounds, cannulas, dilators, and vaginal delineators are now commercially available for this purpose.^{7–9} In this context, sliding in a vaginal delineator helps identify the vaginal fornices and choosing the right sized delineator drum helps maintain the pneumoperitoneum.

The underlying cause of the delineator tube insertion-associated rectovaginal wall laceration remains unclear. A possibility is that the vaginal delineator may have been placed posteriorly due to lack of vaginal distensibility, which is likely to be associated with the patient's virginity. This subsequently may have stretched the posterior vaginal fornix and the anterior wall of rectum, leading to a false presentation of the rectum that caused the unintentional rectal incision. We cannot deny a possibility that the insertion of the vaginal delineator itself may have caused the rectovaginal fistula, although the initial vaginal examination with a small speculum was easily performed before the operation and the intraoperative insertion of the delineator tube was done without notable resistance. A possible contributing mechanism is that the effect of muscle relaxant from general anesthesia could have led to underestimation of the vaginal distensibility. In either case, the lack of vaginal distensibility likely plays some role in this complication.

A recent report by Kavallaris et al¹⁰ provides a significant insight into the prevention of such a complication. The authors described a modification of TLH for patients with vaginal stenosis or a small cervix, in which a uterine manipulator or vaginal tube is not used.¹⁰ Such a technique may serve as a possible option when the patient is a virgin or vaginal stenosis cannot be indubitably secured.

With recent advances in equipment and surgical techniques, it has become feasible to perform TLH for many patients. Nevertheless, we should be aware that unexpected complications could occur in association with a newly introduced device or technique. The feasibility of randomized trials is challenging, due to the availability of numerous techniques, and also different patient mix and surgical skills. Therefore, it is relevant to emphasize the importance of sharing the rare experience, so that complications can be minimized in the future.

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