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Video Article

Real-time intraoperative ureter visualization with a novel Near-Infrared Ray Catheter during laparoscopic hysterectomy for gynecological cancer

Iori Kisu [1,2] **Miho Iida** [2] **Tetsuro Shiraishi** [2] **Moito Iijima** [1] **Kanako Nakamura** [1] **Kiyoko Matsuda** [1] **Nobumaru Hirao** [1]

[1]Department of Obstetrics and Gynecology, Federation of National Public Service Personnel Mutual Aid Associations, Tachikawa Hospital, Tokyo, Japan
[2]Department of Obstetrics and Gynecology, Keio University School of Medicine, Tokyo, Japan

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Correspondence to
Iori Kisu
Department of Obstetrics and Gynecology, Federation of National Public Service Personnel Mutual Aid Associations, Tachikawa Hospital, 4-2-22 Nishiki-cho, Tachikaw-shi, Tokyo 1908531, Japan.
E-mail: iori71march@hotmail.co.jp
iori71march@a7.keio.jp

ORCID iDs
Iori Kisu
https://orcid.org/0000-0003-1143-9855
Miho Iida
https://orcid.org/0000-0001-5527-7574
Tetsuro Shiraishi
https://orcid.org/0000-0003-1741-2549

ABSTRACT

Ureteral injuries are well-known complications of gynecologic surgery, with a higher prevalence in laparoscopic surgery than in laparotomy [1]. The use of near-infrared fluorescent imaging navigation is currently being considered a novel method to identify the ureters intraoperatively and prevent ureteral injuries [2]. The Near-Infrared Ray Catheter (NIRC) fluorescent ureteral catheter is a newly developed device, containing a fluorescent resin that can be recognized by near-infrared irradiation. We found few reports on the use of this catheter in laparoscopic surgery for colon and rectal cancer [3,4], but no reports in gynecologic surgery. We demonstrate the feasibility, safety, and potential usefulness of the real-time intraoperative visualization of the ureters using a novel NIRC fluorescent ureteral catheter in laparoscopic hysterectomy for endometrial cancer. A 30-year-old woman with early grade 1 endometrioid carcinoma was treated with medroxyprogesterone acetate for fertility preservation. After achieving complete response, she got pregnant and underwent cesarean section. The recurrence of atypical endometrial hyperplasia one year post-delivery prompted a total laparoscopic hysterectomy. Before the laparoscopic surgery began, the NIRC fluorescent ureteral catheters were placed in the ureters under the obtainment of informed consent from the patient. During the surgery, the catheters were successfully visualized by near-infrared fluorescence observation, which helped identify the ureters clearly and prevent ureteral injuries. This novel ureteral imaging navigation is expected to be an effective tool in cases of obesity, severe pelvic adhesion, deep infiltrating endometriosis, and malignancy in gynecologic laparoscopic surgery to clearly identify the ureter and to reduce the risk of ureteral injury.

Keywords: Urinary Catheters; Hysterectomy; Surgical Navigation Systems; Infrared Rays; Urinary Tract

Moito Iijima
https://orcid.org/0000-0002-7738-487X
Kanako Nakamura
https://orcid.org/0000-0002-2200-8359
Kiyoko Matsuda
https://orcid.org/0000-0002-2068-6703
Nobumaru Hirao
https://orcid.org/0000-0002-2980-741X

Conflict of Interest
No potential conflict of interest relevant to this article was reported.

VIDEO CLIP

Real-time intraoperative visualization of the ureters by a novel Near-Infrared Ray Catheter fluorescent ureteral catheter in laparoscopic hysterectomy. Video can be found with this article online at https://ejgo.org/src/sm/jgo-32-e93-s001.mp4.

The authors received the IRB approval of Federation of National Public Service Personnel Mutual Aid Associations, Tachikawa Hospital (protocol identification number: 2020-27, date: January 27, 2021).

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