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Scientific letters

Utility of Indocyanine Green for Intra-operative Localization of Ureter in Complex Colo-rectal Surgery[☆]



Utilidad del verde de indocianina para la localización del uréter de forma intra-operatoria en cirugía colorrectal compleja

In colorectal surgery, other structures may sustain injuries due to their proximity in the surgical field. One possible complication during colorectal surgery is damage to a ureter as it passes through the paracolic gutters, either right or left, which can also occur in surgery in other specialties, such as gynecology and urology. Its reported incidence is between 0.5% and 10%.¹

The boom in innovation in imaging techniques for minimally invasive surgery has advanced with the improvement of high-definition or three-dimensional systems, which provide greater safety and efficacy for the patient and surgeon. In this context, the use of new intra-operative imaging techniques, such as indocyanine green (ICG)-enhanced fluorescence in laparoscopy, has allowed us to evaluate the future viability of intestinal anastomoses in colorectal surgery in the absence of randomized and long-term studies.²

Indocyanine is a fluorescent cyanine dye that provides real-time visualization of the intra-operative anatomy once the vision mode is activated on the monitor. This product is used to determine cardiac output, liver function and hepatic blood flow, as well as being used in ophthalmology for eye angiograms, presenting a half-life of 150–180 s. It is eliminated from the systemic circulation exclusively by the liver through biliary excretion.

Indocyanine is administered intravenously and, depending on the liver function, it will be eliminated more or less quickly.³ The most frequent use is that used to measure organ and tissue perfusion. The light used for excitation of the fluorescence is generated by an infrared light source, which is detected directly by the optics used, recording the image in real time.

Thanks to this physiological principle, we have used the application of ICG to identify the pathways of structures such as the ureters, which, in complex colorectal surgeries, are difficult to locate in order to avoid injury and greater complications.

We present the case of a 62-year-old man who was in follow-up with the urology department due to recurrent urinary tract infections. A transurethral study identified a solid-appearing polypoid lesion on the posterior side measuring 2 cm; histopathology identified it as polypoid cystitis, with no evidence of malignancy. In the extension studies with computed tomography (CT) of the pelvis-abdomen using intravenous contrast, a colovesical fistula was observed with increased attenuation coefficient of fat near the sigmoid colon, findings that could be suggestive of neoplastic involvement versus diverticulosis with an inflammatory component. Afterwards, a colonoscopy study was carried out, which showed a lesion 10 cm from the anal margin compatible with middle rectal cancer; the histopathological study identified it as tubulovillous adenoma with moderate dysplasia. The study was completed with endoanal ultrasound, which only demonstrated an image of the mentioned polyp, which was staged as T3. Exploratory laparoscopic surgery was scheduled for resection of the colovesical fistula, left hemicolectomy and anterior rectal resection.

Both ureters were catheterized with a 6 Fr catheter before beginning the intervention. Once the complexity of the surgical field was confirmed due to the inflammatory conglomerate the patient presented in the recto-sigmoid area, 25 mg of sterile ICG in 10 mL of distilled water were introduced retrogradely through the catheters. The waiting time was non-existent because, while the fluorescent product was being inserted, we changed the filter of the optics to visualize the fluorescent reflection emanating from the ureter lumen, as shown in Fig. 1.

Thanks to the intra-operative use of ICG, we were able to identify the left ureter in an inflammatory, and therefore complex, surgical field, which would have increased the probability of ureteral injury. The postoperative period was

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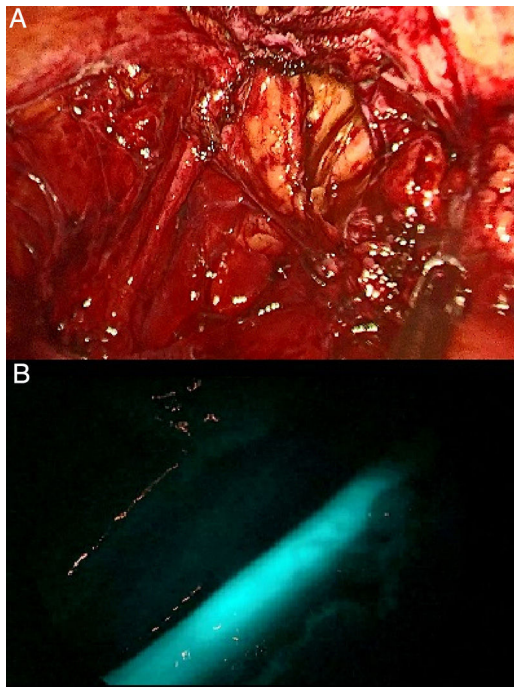


Image 1 – (A) Unfiltered image demonstrating an inflammatory conglomerate in the theoretical location of the left ureter; (B) ICG enhancement in the lumen of the ureter after retrograde injection through the ureteral catheter.

uneventful. The patient currently lives a normal daily life and is monitored in follow-up appointments.

The use of ICG provides very good results in the field of colorectal surgery for the real-time evaluation of the perfusion of the proximal end of the intestinal loop and the distal end before anastomosis, thereby avoiding, *a priori*, a potential anastomotic leak in the postoperative period.⁴

The extension of its use to identify structures that are difficult to visualize in complex surgeries in which the field is distorted and unstructured is illustrated in the intraoperative localization of the ureter, thus preventing injury to it.

This technique is useful and easy to reproduce; the most complex part of the process is the administration of the dye and the technological infrastructure necessary for visualization.^{5,6}

Even so, more studies are needed with a greater degree of scientific evidence in order to consolidate the use of ICG in daily practice.

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Persistent Disease and Recurrence in Medullary Thyroid Carcinoma: A Case Series[☆]

Enfermedad persistente y recaída en el carcinoma medular de tiroides. Serie de casos



Medullary thyroid carcinoma (MTC) is a rare disease that is silent and usually diagnosed in advanced stages, representing

2%–5% of all thyroid cancers. After years of study, we have been able to better understand its relationship with genetic

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