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Robotic radical cystectomy and bilateral nephrectomy in a renal transplant patient: the indocyanine green technique

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Robotic surgery is a promising alternative to open surgery in addressing complex urological cases. Here we described a case of invasive urothelial carcinoma of the bladder in a renal transplant recipient, managed by a novel technique utilizing intra-ureteral indocyanine green (ICG) to aid in robotic radical cystectomy and bilateral nephrectomy.

The patient is a 61-year-old female with a history of renal transplantation in the right iliac fossa. Muscle-invasive urothelial carcinoma was found after cystoscopy and subsequent transurethral resection of bladder tumour (TURBT). The patient was put in the Trendelenburg position at 15 degrees with legs spread apart. The graft ureter was catheterized with a 6 Fr catheter for later ICG injection. Port setting was largely similar to that used in conventional robotic cystectomy, apart from the rightmost lateral port for the fourth robotic arm, which was inserted slightly more cephalad due to presence of kidney graft.

The procedure began with the transection of the round ligament, broad ligament, and the vascular pedicle. Both native ureters were then identified and transected. Lateral dissection of the bladder was performed, with extra care taken on the right due to uncertainty in the graft ureter's position. A total

of 25 mg of ICG was diluted with 400 ml of water and injected into the graft ureter; subsequent imaging with the Firefly system aided in the identification of the graft ureter. Further dissection uncovered the T-junction between the bladder and graft ureter, clearly delineated by ICG fluorescence. After dissecting the bladder from pelvic sidewall, graft ureter was transected, with the frozen margin sent for pathological examination.

The vaginal vault was opened, and the incision extended anteriorly towards the urethra. The urethra was dissected from the anterior vaginal wall, after which the vaginal wall behind the urethra was transected. The urethrectomy was completed through a perineal approach. The specimen was then put into specimen bag and retrieved through the vaginal wall defect.

An extended pelvic lymph node dissection was performed only on the left side, as presence of the kidney graft precluded right side lymph node dissection. We then proceeded to the intracorporeal ileal conduit creation. A 15 cm ileal segment was first isolated with an Endo-GIA 60 mm stapler. After spatulating the graft ureter, an end-to-end uretero-ileal anastomosis was performed with PDS 5/0 suture. An 8 Fr

infant feeding tube was inserted across the anastomosis for stenting.

For the bilateral native nephrectomy, the operating table was turned to the left semi-lateral position. Two additional 8 mm robotic ports were placed in the right upper quadrant (RUQ) and left upper quadrant (LUQ). Robot was docked per conventional nephrectomy setting.

The operation lasted 543 minutes. Blood loss was 500 ml. Patient was discharged on post-operative day 8. Pathological examination revealed pT1N0 high grade urothelial carcinoma of the urinary bladder with clear margins.

In conclusion, robotic radical cystectomy and bilateral nephrectomy, with the intra-ureteral use of ICG helping in identification of the graft ureter, is a safe and feasible option for renal transplant patients with invasive urothelial carcinoma.

CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

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