Challenges in Robot-Assisted Kidney Transplant: A Case Series of 22 Patients

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Abstract

Introduction: Robot-assisted kidney transplantation (RAKT) has recently been introduced as a management option for patients with end-stage renal disease. Although open kidney transplant (OKT) remains the gold standard, RAKT is increasingly being adopted across the world as a technique with equivalent outcomes and lesser complications especially for obese patients. The challenges encountered during the performance of vascular anastomosis owing to multiple renal vessels and right-sided renal allograft transplant (short renal vein) are potential reasons for nonselection of patients for RAKT as well as open conversion.

Objective: To demonstrate technical feasibility of RAKT in right-sided (with short renal vein) and multiple vessel renal allografts.

Materials and Methods: This is a retrospective study of 22 patients who underwent RAKT with right-sided (04) and multiple vessel (18) renal allografts in a quaternary private hospital setting. The results were compared with 22 OKT patients. All the surgeries were performed by a single surgeon with >5 years experience in RAKT and OKT. Clinical data were collected in a Microsoft Excel-based database. A descriptive statistical analysis was performed.

Surgical Procedure: The techniques used for managing multiple vessel renal allograft were side-to-side trousering of multiple vessel renal allograft on the bench (5 in RAKT vs 1 in OKT) followed by robot-assisted vascular anastomosis, end-to-side anastomosis of single renal artery to external iliac artery (8 in RAKT vs 10 in OKT), anastomosis of smaller caliber, accessory renal allograft artery to the inferior epigastric artery (2 in RAKT vs 1 in OKT) and double barrelled anastomosis of double vessel renal allograft to two separate arteriotomy incisions made in the external iliac artery (3 in RAKT vs 6 in OKT).

Results: Total of 44 patients underwent kidney transplant in this study (22 RAKT and 22 OKT). The mean age of the recipients was 37.1 ± 13.2 and 35.2 ± 12.8 years in RAKT and OKT groups, respectively. The mean time from clamping to perfusion of the renal allografts was 74 ± 16.3 minutes (RAKT) and 69.4 ± 15.3 minutes (OKT group; p -value 0.332). The mean operating time was 165 ± 22 vs 175 ± 33 minutes in RAKT and OKT groups, respectively (p -value 0.344). The mean hospital stay was 6.71 ± 1.7 days (RAKT) vs 7.75 ± 2.3 days (OKT), respectively (p -value 0.17), and the time to nadir

creatinine was 6.5 ± 1.23 days in the RAKT group as compared with 5.9 ± 1.1 days in the OKT group (p -value 0.6). The pain score on day 4 and mean analgesia requirement on postoperative day 1 were significantly lower in the RAKT group than in the OKT group (p -value 0.0004 and 0.02, respectively). The mean incision length was also significantly (p -value 0.0001) smaller in the RAKT group (8.2 ± 0.9 cm) than in the OKT group (17.1 ± 2.9 cm).

Conclusion: RAKT is a feasible option for patients receiving right-sided and multiple vessel renal allografts and the challenges could be safely overcome by the techniques described.

Patient Consent Statement: Appropriate consent was taken from the patients to reproduce the results of the study.

Author Disclosure Statement: We have received and archived patient consent for video recording/publication in advance of video recording of the procedure.

Runtime of video: 7 mins 44 secs

Keywords: RAKT, challenges, multiple vessel renal allograft, right-sided renal allograft

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