

Bricker Urinary Diversion after Radical Cystectomy: A Comparative Analysis of Laparoscopic vs. Robotic Approach in Terms of Quality of Life, Perioperative Outcomes and Postoperative Complications

Cosmin-George Radu^{1,2}, George Daniel Rădăvoi^{1,2}, Justin Aurelian^{1,2}, Ion-Florin Achim^{1,3}, Iulia Andras⁴, Maximilian Buzoianu⁴, Elisabeta Ioana Hiriscu⁴, Nicolae Crisan⁴, Florin Grama^{5,6}, Silviu Constantinoiu^{1,3}, Viorel Jinga^{1,2,7}

¹Carol Davila University of Medicine and Pharmacy, Bucharest, Romania

²Department of Urology, Prof. Dr. Th. Burhele Clinical Hospital, Bucharest, Romania

³Department of General Surgery and Esophageal Surgery, Sf. Maria Clinical Hospital, Bucharest, Romania

⁴Department of Urology, Iuliu Hașeganu University of Medicine and Pharmacy, Cluj-Napoca, Romania

⁵Department of General Surgery, Coltea Clinical Hospital, Bucharest, Romania

⁶Department of General Surgery, number 10, Carol Davila University of Medicine and Pharmacy, Bucharest, Romania

⁷Medical Sciences Section, Academy of Romanian Scientists, Bucharest, Romania

Abstract

Introduction: Radical cystectomy with ileal conduit urinary diversion (Bricker technique) remains the standard treatment for localized muscle-invasive bladder cancer (MIBC), as well as for high-risk non-muscle-invasive bladder cancer (NMIBC). Amid the transition toward minimally invasive techniques, comparing laparoscopic radical cystectomy (LRC) with robot-assisted radical cystectomy (RARC) becomes essential, particularly regarding perioperative morbidity and postoperative health-related quality of life. However, real-world data from Eastern Europe remain limited. Objective: To compare peri- and postoperative clinical outcomes and quality of life in patients undergoing radical cystectomy with Bricker urinary diversion via laparoscopic versus robotic approach.

Materials and Methods: This is a retrospective, observational study conducted between March 2023 and March 2025 in two academic centers in Cluj-Napoca, Romania. A total of 37 patients diagnosed with MIBC were included and allocated into two groups based on the surgical approach: laparoscopic (n=22) and robotic (n=15). Clinical, biological, and surgical parameters were collected pre- and postoperatively. Quality of life was assessed at 3 months using the EQ-5D-5L and EQ-VAS instruments. Statistical analyses included t-tests, Mann-Whitney U tests, linear regression models, and correlation coefficients, with a significance threshold of $p < 0.05$.

Results: The robotic group demonstrated significantly better postoperative renal function (eGFR: 84.2 ± 5.88 vs. 66.55 ± 5.59 ml/min/1.73m²; $p=0.041$) and a shorter median hospital stay (7 days, IQR 6–8 vs. 9 days, IQR 7–13; $p=0.045$), despite a longer operative time (463 ± 25.4 vs. 415 ± 21.52 minutes). Severe postoperative complications were significantly more frequent in the laparoscopic group (54.5% vs. 6.7%; $p=0.004$). Preexisting urinary tract infections, more common in the LRC group (45.5% vs. 20%), were independently associated with decreased postoperative renal function ($\beta = -0.39$, $p=0.005$). The mean EQ-VAS score was higher in the robotic group (84.93 ± 2.64 vs. 76.81 ± 4.42 ; $p < 0.01$), despite a lower EQ-5D-5L utility index (0.52 ± 0.12 vs. 0.72 ± 0.05 ; $p=0.02$), indicating an overall favorable health perception despite objectively reduced functional outcomes. Postoperative complications were significantly correlated with decreased EQ-VAS scores (71.39 ± 20.49 vs. 88.37 ± 71.13 ; $p=0.004$).

Conclusions: In the real-world clinical setting of Eastern Europe, the robotic approach to radical cystectomy with Bricker urinary diversion was associated with better preserved renal function, shorter hospitalization and a lower incidence of severe complications. Preoperative urinary tract

infections negatively impacted renal function independently of baseline eGFR. Although RARC patients showed more pronounced functional impairments as measured by EQ-5D-5L, their overall health perception (EQ-VAS) was significantly better, suggesting the influence of technological expectations and postoperative satisfaction. These results support the implementation of robotic surgery in advanced urological centers and highlight the need for prospective, randomized trials with extended follow-up focusing on functional outcomes and quality of life.

Keywords: robot-assisted cystectomy, laparoscopic cystectomy, Bricker urinary diversion, muscle-invasive bladder cancer, quality of life; EQ-5D-5L, EQ-VAS visual analogue scale, renal function, postoperative complications, minimally invasive surgery