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Renal outcomes of laparoscopic versus open surgery in patients with rectal cancer: a propensity score analysis

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Objectives:

The laparoscopic approach in abdominal surgery is widely used and has many advantages over open surgery (OS). However, the renal outcomes of laparoscopic surgery (LS) are still not proven in rectal cancer. Thus, we compared the renal outcomes between LS and OS in patients with rectal cancer.

Methods:

We conducted a retrospective cohort study of 1641 patients who underwent rectal cancer surgery between 2003 and 2017. Postoperative AKI was determined according to the serum creatinine criteria of the Kidney Disease: Improving Global Outcomes classification.

Results: Among 1641 patients, 1075 patients (65.5%) underwent LS. The incidence of postoperative AKI in LS was significantly lower than in OS (10.4 vs. 20.7%, $p < 0.001$, respectively). After matching propensity scores (1:1), 359 patients were included in each group. LS group still demonstrated a significantly lower incidence of postoperative AKI than OS group (11.7 vs. 18.1%, $p = 0.021$, respectively). The operation time, estimated blood loss, incidence of transfusion in LS group were significantly lower than in OS group ($p < 0.001$). No difference in renal recovery between LS and OS groups was found (47.6 vs. 53.8%, $p = 0.558$, respectively). After adjusting all covariables, LS group had lower incidence of postoperative AKI than OS group (OR, 0.599; 95% CI, 0.394-0.911; $p = 0.017$). In subgroup analysis, LS had much lower incidence of postoperative AKI than OS in patients with American Society of Anesthesiologists (ASA) score ≤ 2 (OR, 0.569; 95% CI, 0.360-0.899; $p = 0.016$) and in patients who did not receive neoadjuvant chemotherapy (OR, 0.520; 95% CI, 0.308-0.877; $p = 0.014$).

Conclusions:

This study showed that LS may reduce postoperative AKI in patients with rectal cancer and that its beneficial effect may be associated with operation time or intraoperative bleeding events and be dominant in patients with low ASA score and no chemotherapy.