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MATTERS ARISING

Evaluating organ preservation strategies versus radical surgery in T2N0 rectal cancer: survival outcomes and tumor size impact

Qiuhan Yao[1] · Wei-Yu Yang[2]

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Dear Editor:

We read with great interest the article titled "*Comparative analysis of organ preservation attempt and radical surgery in clinical T2N0 mid to low rectal cancer*" by Hyeung-min Park et al. [1]. This study compared the outcomes of organ-preserving strategies versus radical surgery in patients with T2N0 mid to low rectal cancer. The results revealed that oncologic outcomes were comparable between patients receiving organ-preserving strategies and those undergoing radical surgery. Therefore, organ-preserving strategies may be a viable and safe alternative to radical surgery for patients with T2N0 rectal cancer.

These findings have significant clinical implications for T2N0 rectal cancer. However, the study has some limitations. First, the study only evaluated oncologic outcomes (local recurrence-free survival and disease-free survival) and did not assess overall survival (OS) and cancer-specific survival (CSS). OS has long been considered the gold standard primary endpoint in clinical research for solid cancers [2]. As a measure of clinical benefit, OS is straightforward to measure and interpret, providing clear clinical meaning for patients. However, OS requires larger patient cohorts and longer follow-up periods compared to other endpoints [3]. It remains unclear whether organ-preserving treatment offers comparable OS and CSS to radical surgery in T2N0 rectal cancer. Second, significant baseline differences were observed between the organ-preserving and radical surgery groups, which may have influenced the outcomes. Third, some clinical information was absent in their study. These include margin status after resection, tumor circumferential location, histological type, pathological stage (e.g., pT, pN, and pStage), the response to neoadjuvant treatment (e.g., the proportion of clinical complete responses), and the interval between the completion of neoadjuvant treatment and surgery. The complexity of local excision (LE) varies depending on tumor circumferential location (e.g., anterior wall vs. posterior wall) [4]. The other factors may also influence the results [5]. Such information is important but was not provided in their manuscript. Finally, the study did not perform subgroup analyses to compare the effectiveness of organ-preserving strategies with radical surgery, making it uncertain which patients are more suitable for organ-preservation strategies. This limitation may be due to the small sample size in the radical surgery cohort ($n=28$), resulting in limited sample sizes in certain subgroups, which constrained further subgroup analysis.

The organ preservation strategies in the study by Hyeung-min Park et al. included LE, chemoradiotherapy, LE plus adjuvant chemoradiotherapy (ACRT), and neoadjuvant chemoradiotherapy plus LE. Using the Surveillance, Epidemiology, and End Results (SEER) database, we performed a large-sample comparative analysis between patients with T2N0 rectal cancer who underwent LE + ACRT versus those who received radical surgery. The SEER program of the National Cancer Institute is a population-based cancer registry program [6]. The flowchart of case selection is presented in Figure S1. The patients who received neoadjuvant treatment were excluded. According to clinical guidelines, adjuvant therapy is not recommended for patients with T2N0M0 rectal cancer who have undergone radical surgery [7, 8]. Therefore, none of the patients in the radical surgery group received adjuvant treatment. A total of 3,147 patients were retrieved from the SEER database, representing a significantly larger cohort compared to the 119 cases analyzed by Hyeung-min Park et al. This expanded sample size was sufficient to perform further subgroup analysis to identify patients who are more suitable for LE + ACRT. The larger cohort size also enhances the credibility of research

✉ Wei-Yu Yang
yangweiyu@csu.edu.cn

[1] College of Humanities and Development Studies, China Agricultural University, Beijing, China

[2] The Second Xiangya Hospital, Central South University, Changsha, China

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[9]. Additionally, propensity score matching (PSM) was employed to balance baseline differences between the groups and reduce potential confounding factors [10]. A 1:3 nearest-neighbor matching algorithm with a caliper of 0.10 was applied. Group comparisons were performed using Fisher's exact test or the chi-square test. Kaplan–Meier curves and Cox regression analyses were used to analyze survival. A p-value < 0.05 was considered statistically significant. All analyses were performed using R version 4.3.2.

In the whole cohort, 3,147 patients with pathologically diagnosed T2N0 rectal cancer postoperatively were included, consisting of 187 patients who received LE + ACRT and 2,960 patients who underwent radical surgery. Significant differences in baseline characteristics were observed between the LE + ACRT and radical surgery groups before PSM (Table S1). The LE + ACRT group had a larger proportion of high histological grade tumors, a lower proportion of adenocarcinoma cases, and smaller tumor sizes compared to the radical surgery group ($p < 0.05$). Kaplan–Meier analysis showed that the patients who received LE + ACRT had OS and CSS comparable to those who received radical surgery in the whole cohort ($p > 0.05$, Fig. 1a, b). After PSM, baseline characteristics between the LE + ACRT and radical surgery groups were well balanced. Both OS and CSS in patients who received LE + ACRT were still comparable to those who underwent radical surgery after PSM ($p > 0.05$, Fig. 1c, d).

Subgroup analysis using the Cox proportional hazards model revealed that patients receiving LE + ACRT had OS and CSS comparable to those who received radical surgery across almost all subgroups (OS: Fig. 1e; CSS: Fig. 1f). However, in patients with tumors ≥ 2.0 cm, CSS was significantly better in the radical surgery group compared to the LE + ACRT group ($p < 0.05$). Kaplan–Meier analysis further supported these findings, showing that for patients with tumors < 2.0 cm, both before and after PSM, OS and CSS were comparable between the LE + ACRT and radical surgery groups ($p > 0.05$, Figure S2). In contrast, for patients with tumors ≥ 2.0 cm, the radical surgery group had a significantly better CSS compared to the LE + ACRT group ($p < 0.05$, Figure S3). These results suggest that LE + ACRT is more suitable for tumors < 2.0 cm. One possible explanation is that for smaller tumors, LE + ACRT is sufficient to eliminate most tumor cells [11]. Conversely, as tumor size increases, LE + ACRT may not completely remove the tumor, potentially leading to tumor recurrence and a worse prognosis [12]. For tumors ≥ 2.0 cm, radical surgery may be the preferred treatment over LE + ACRT. Therefore, tumor size should be a key consideration when recommending LE + ACRT in T2N0 rectal cancer.

In conclusion, our study revealed that in patients with T2N0 rectal cancer, both OS and CSS in the LE + ACRT group were compared to those in the radical surgery group. Furthermore, LE + ACRT appears to be more suitable for patients with tumors < 2.0 cm. The strengths of our study include a much larger patient cohort compared to the study by Hyeung-min Park et al. and the application of PSM, which enhances the reliability of our results. The main limitation is the lack of some clinical information in the SEER database [13], including detailed tumor location, tumor circumferential involvement, margin status after resection, and MRI data, all of which may influence outcomes. Another limitation is the statistical limitation of subgroup analysis [14]. Further research is warranted due to the small number of patients in some subgroups and potential confounding factors. We sincerely appreciate the contributions of Hyeung-min Park et al., and our study builds upon and complements their findings, offering further insights into treatment strategies for patients with T2N0 rectal cancer.

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Data availability The data analyzed in this study are publicly available in the SEER database (https://seer.Cancer.gov/).

Declarations

Ethical approval and Informed consent As the SEER database is a publicly available database and all data are anonymized, patient informed consent and ethical approval were not required.

Competing interests The authors declare no competing interests.

References

1. Park HM, Lee J, Lee SY, Kim CH, Kim HR (2024) Comparative analysis of organ preservation attempt and radical surgery

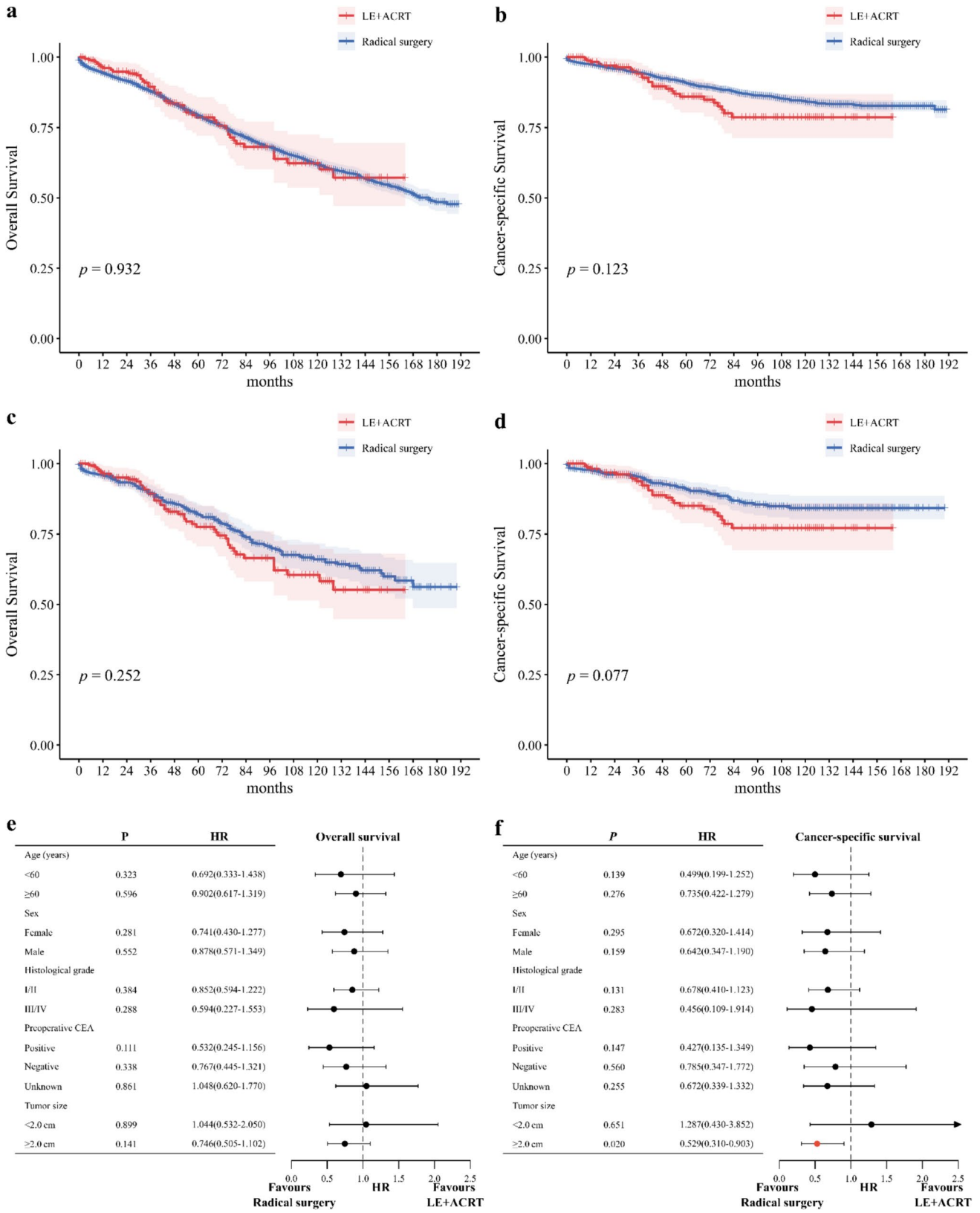

Fig. 1 Kaplan–Meier survival curves for patients with T2N0 rectal cancer before **a, b** and after **c, d** PSM. Forest plots depicting subgroup analysis of OS **e** and CSS **f** between the LE + ACRT and radical surgery groups. PSM, propensity score matching; OS, overall survival; CSS, cancer-specific survival; LE, local excision; ACRT, adjuvant chemoradiotherapy; CEA, carcinoembryonic antigen; HR, hazard ratio

in clinical T2n0 mid to low rectal cancer. Int J Colorectal Dis 39(1):136. https://doi.org/10.1007/s00384-024-04708-6
2. Veas Rodríguez J, Prieto A, Vilaprinyo E, Bonet M, Diez M, Salud A et al (2024) Surrogate endpoints in phase III randomized trials of advanced gastroesophageal cancer: a systematic review and meta-analysis. Crit Rev Oncol Hematol 201:104416. https://doi.org/10.1016/j.critrevonc.2024.104416
3. Pawlyn C, Schjesvold FH, Cairns DA, Wei LJ, Davies F, Nadeem O et al (2024) Progression-free survival as a surrogate endpoint in myeloma clinical trials: an evolving paradigm. Blood Cancer J 14(1):134. https://doi.org/10.1038/s41408-024-01109-4
4. Binda C, Secco M, Tuccillo L, Coluccio C, Liverani E, Jung CFM et al (2024) Early rectal cancer and local excision: a narrative review. J Clin Med 13(8):2292. https://doi.org/10.3390/jcm13082292
5. Lee PH, Kuo SH, Lin BR, Chen YH (2024) The impact of radiation dose on chemoradiation outcomes and rectum preservation in locally advanced rectal cancer: a retrospective study. J Formos Med Assoc S0929–6646(24):00546–00551. https://doi.org/10.1016/j.jfma.2024.11.009
6. Cai Y, Jiang L, Ju H, Zhu Y, Liu Z (2024) Therapeutic strategies for ypT1 rectal cancer after neoadjuvant chemoradiotherapy: a retrospective cohort study. Int J Colorectal Dis 39(1):189. https://doi.org/10.1007/s00384-024-04764-y
7. National Health Commission of the People′s Republic of China, Chinese Society of Oncology (2023) Chinese protocol of diagnosis and treatment of colorectal cancer (2023 edition). Zhonghua Wai Ke Za Zhi 61(8):617–644. https://doi.org/10.3760/cma.j.cn112139-20230603-00222
8. Capdevila J, Gómez MA, Guillot M, Páez D, Pericay C, Safont MJ et al (2022) SEOM-GEMCAD-TTD clinical guidelines for localized rectal cancer (2021). Clin Transl Oncol 24(4):646–657. https://doi.org/10.1007/s12094-022-02816-9
9. Tsai HY, Chuang HJ, Liao WH, Wang YJ, Li PH, Wang WT et al (2024) Lifestyle modifications and non-pharmacological management in elderly hypertension. J Formos Med Assoc S0929–6646(24):00509–00516. https://doi.org/10.1016/j.jfma.2024.10.022
10. Karkhanis DR, Bakshi SG, Divatia JV, Kannan S (2023) Role of gabapentinoids in post-operative pain management in thoracic surgeries: a single-centre propensity score-matched audit. Indian J Anaesth 67(Suppl 1):S35–S40. https://doi.org/10.4103/ija.ija_498_22
11. Bach SP, Hill J, Monson JR, Simson JN, Lane L, Merrie A et al (2009) A predictive model for local recurrence after transanal endoscopic microsurgery for rectal cancer. Br J Surg 96(3):280–290. https://doi.org/10.1002/bjs.6456
12. Zhao S, Chen X, Wen D, Zhang C, Wang X (2021) Oncologic nomogram for stage I rectal cancer to assist patient selection for adjuvant (Chemo)radiotherapy following local excision. Front Oncol 11:632085. https://doi.org/10.3389/fonc.2021.632085
13. Liang B, Xie S, Yu N, Xue X, Zeng H, Que Z et al (2024) Impact of lymph node retrieval on prognosis in elderly and non-elderly patients with T3–4/N+ rectal cancer following neoadjuvant therapy: a retrospective cohort study. Int J Colorectal Dis 39(1):86. https://doi.org/10.1007/s00384-024-04655-2
14. Nair AS, Borkar N (2024) Sensitivity and subgroup analysis in a meta-analysis - What we should know? Indian J Anaesth 68(10):922–924. https://doi.org/10.4103/ija.ija_623_24