ORIGINAL ARTICLE
Turk J Surg 2025;41(4):347-354

Long-term outcomes of extended versus segmental resection for transverse colon cancer: A population-based analysis based on the SEER database

Çiğdem Benlice[1], Metincan Erkaya[2], Afag Aghayeva[3], Volkan Özben[4], Emre Görgün[2], Deniz Atasoy[1], Bilgi Baca[4]

[1]Department of General Surgery, İstanbul Health and Technology University Faculty of Medicine, İstanbul, Türkiye
[2]Department of Colorectal Surgery, DDSI, Cleveland Clinic, Cleveland, Ohio, US
[3]Clinic of General Surgery, Acıbadem Altunizade Hospital, İstanbul, Türkiye
[4]Department of General Surgery, Acıbadem Mehmet Ali Aydınlar University Faculty of Medicine, İstanbul, Türkiye

ABSTRACT

Objective: To investigate long-term cancer-specific outcomes associated with extended versus segmental colectomy (SC) in patients with stage I-III transverse colon adenocarcinoma using a large, population-based cohort.

Material and Methods: Patients who diagnosed with transverse colon cancer undergoing curative-intent colectomy were identified from the surveillance, epidemiology, and end results database (2013-2019). Surgical procedures were categorized as extended colectomy (EC) or SC based on standardized procedural coding. 1:1 propensity score matching was performed to reduce selection bias and balance baseline characteristics. Cancer-specific survival (CSS) was analyzed using multivariable Cox proportional hazards regression.

Results: Among 18,799 eligible patients, 58% underwent EC. EC was more frequently performed in individuals with higher tumor stage (p<0.01) and those receiving adjuvant chemotherapy (26% vs. 23%, p<0.01). After matching (n=7.904 in each group), EC was associated with a higher rate of adequate lymphadenectomy (>12 lymph nodes retrieved: 94% vs. 89%, p<0.01). Five-year overall survival did not differ significantly between groups (65.6% for EC vs. 66.9% for SC, p=0.074). However, SC was associated with a modest but statistically significant improvement in CSS (84.3% vs. 81.7%, p<0.01). In adjusted analysis, surgical extent (HR=0.8376, p<0.001), along with age, sex, tumor grade, stage, and lymph node yield, were independently associated with CSS.

Conclusion: While EC is more commonly utilized in advanced-stage disease and facilitates higher lymph node retrieval, SC offers comparable—and potentially superior—CSS in selected patients. These findings support the consideration of a tailored surgical strategy based on tumor biology and individual patient characteristics.

Keywords: Transverse colon, segmental colectomy, extended colectomy, SEER, survival

INTRODUCTION

Transverse colon cancer constitutes a relatively uncommon subtype of colorectal malignancy, accounting for approximately 10% of all cases (1). Due to its anatomical position adjacent to major vascular and visceral structures, these tumors often present at more advanced stages and exhibit a higher propensity for local invasion. Surgical management is particularly complex, owing to the significant anatomical variability and the requirement for meticulous, individualized operative planning. This complexity is further magnified in minimally invasive approaches, which demand advanced technical expertise. As a result, transverse colon tumors are frequently excluded from randomized controlled trials comparing laparoscopic and open colorectal surgery (2,3).

Embryologically, the transverse colon arises from both the midgut and hindgut, resulting in a complex vascular architecture and heterogeneous lymphatic drainage (4). This dual origin complicates the standardization of resection techniques and contributes to the lack of consensus on optimal surgical management. Unlike right- or left-sided colon cancers, transverse colon tumors lack uniform treatment protocols. Surgical options include segmental colectomy (SC), extended right or left hemicolectomy, and subtotal colectomy, with the choice often dictated by tumor location, anatomical considerations, and surgeon experience (5,6).

Cite this article as: Benlice Ç, Erkaya M, Aghayeva A, Özben V, Görgün E, Atasoy D, et al. Long-term outcomes of extended versus segmental resection for transverse colon cancer: a population-based analysis based on the SEER database. *Turk J Surg.* 2025;41(4):347-354

Corresponding Author
Çiğdem Benlice

E-mail: cigdembenlice@gmail.com
ORCID ID: orcid.org/0000-0002-5211-1779

Received: 18.07.2025
Accepted: 25.08.2025
Epub: 08.10.2025
Publication Date: 08.12.2025

DOI: 10.47717/turkjsurg.2025.2025-7-6

Available at www.turkjsurg.com

Previous studies addressing surgical strategies in this region have often included tumors at the hepatic or splenic flexures, rather than isolated mid-transverse lesions (7-9). As a result, much of the available literature focuses on extended hemicolectomies, limiting its applicability to true transverse colon cancers. In the absence of high-quality, focused data, there remains no clear consensus regarding the optimal extent of resection. Consequently, the choice between segmental and extended colectomy (EC) remains subjective and varies across institutions (10).

To address this knowledge gap, we conducted a population-based study using surveillance, epidemiology, and end results (SEER) database to compare long-term oncologic outcomes between extended and SC in patients with stage I-III transverse colon adenocarcinoma.

MATERIAL and METHODS

Patient Selection

Patients diagnosed with stage I-III adenocarcinoma of the transverse colon who underwent curative-intent surgical resection between 2013 and 2019 were identified using the SEER database. As a nationally representative and population-based cancer registry, SEER compiles comprehensive and standardized data on cancer incidence, treatment modalities, and patient outcomes across multiple U.S. regions, serving as a valuable resource for large-scale epidemiologic and outcomes research.

Eligible cases were identified using the International Classification of Diseases for Oncology, Third Edition (ICD-O-3) code C18.4, corresponding to tumors located in the transverse colon. The following exclusion criteria were applied: Presence of stage IV disease at diagnosis; histologic subtypes other than conventional adenocarcinoma, including signet-ring cell carcinoma (8490/3) and mucinous adenocarcinoma (8480/3, 8481/3); concurrent or prior primary malignancies; unknown tumor site; incomplete staging information (T or N stage); synchronous or recurrent tumors; and missing survival data.

Surgical Classification

Surgical procedures were categorized using SEER procedure codes as follows:

EC: Defined as either a subtotal or hemicolectomy involving the transverse colon (SEER surgical code 40), or a total colectomy extending from the cecum to the rectosigmoid junction (code 50).

SC: Defined as a localized or partial resection confined to the transverse colon (code 30).

Variables and Outcomes

Demographic data, tumor-related variables, and survival outcomes—including overall survival (OS) and cancer-specific survival (CSS)—were compared between the EC and SC groups. The primary outcome was long-term survival stratified by the type of surgical resection.

Statistical Analysis

Descriptive statistics were employed to summarize baseline patient and tumor characteristics. Continuous variables were reported as means with standard deviations or medians with interquartile ranges (IQR), while categorical variables were summarized as counts and percentages. OS and CSS were estimated using Kaplan-Meier curves, and group comparisons were performed using the log-rank test.

To reduce selection bias and ensure comparability between groups, 1:1 propensity score matching (PSM) was conducted using a nearest-neighbor algorithm without replacement. Matching variables included age, sex, tumor stage, histologic grade, and chemotherapy administration. Following matching, multivariable Cox proportional hazards models were used to identify independent predictors of CSS. Hazard ratios (HRs) with 95% confidence intervals were reported. A two-sided p-value <0.05 was considered statistically significant. All analyses were performed using R software (version 4.2.3; R Foundation for Statistical Computing, Vienna, Austria).

Ethical Approval

The study protocol was reviewed and approved by the Ethics Committee of Acıbadem University (approval number: 2025-09/352, date: 12.06.2025). As the analysis was conducted using anonymized, publicly available data from the SEER database, the committee determined that the study met the criteria for formal approval without additional ethical requirements.

RESULTS

Patient Cohort

A total of 37,900 patients diagnosed with transverse colon cancer were initially identified from the SEER database. After applying exclusion criteria—stage 0, stage IV, or unknown disease stage (n=4.622); histologic subtypes other than adenocarcinoma (n=5.495); absence of surgical intervention (n=3.415); and incomplete data or other predefined exclusions (n=5.569)—a final analytic cohort of 18,799 patients was established (Figure 1). Of these, 10,895 patients (58%) underwent EC, while 7.904 patients (42%) received SC.

Trends in Surgical Approach

Temporal trends in surgical management from 2013 to 2019 are illustrated in Figure 2. The proportion of patients undergoing EC gradually increased during the study period. In contrast, the use of SC initially rose but subsequently declined, indicating a shift in practice patterns favoring extended resections in recent years.

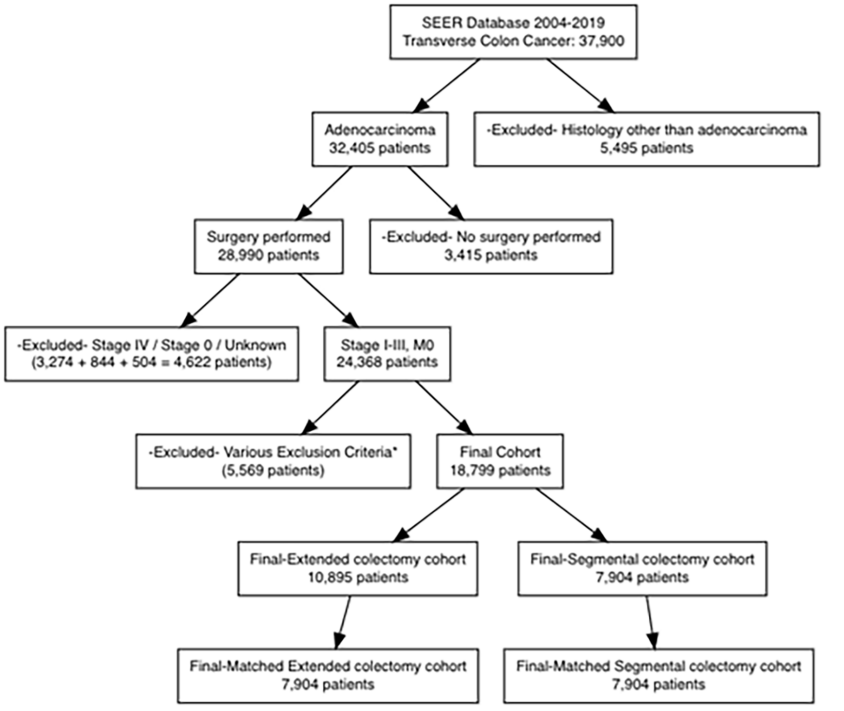

Figure 1. Flowchart of patient selection.

*The following exclusion criteria were applied: surgery not EC or SC (2,758 patients), diagnosed at autopsy (708 patients), incomplete follow-up dates/0 days of survival (780 patients), died within a month after surgery (624 patients), unknown/missing death information (98 patients), unknown/missing grade information (516 patients) and received radiation (85 patients).

EC: Extended colectomy, SC: Segmental colectomy, SEER: Surveillance, epidemiology, and end results

Baseline Characteristics Before Matching

Table 1 presents the unadjusted demographic and clinicopathologic features of the EC and SC groups. Patients undergoing SC were slightly older (median age: 72 vs. 71 years, p<0.01) and had a lower proportion of males (48% vs. 50%, p=0.003). SC was more frequently performed for well-differentiated tumors (11% vs. 9%, p<0.01), whereas poorly differentiated tumors were more common in the EC group. In terms of stage, SC was predominantly used for stage I tumors (31% vs. 26%, p<0.01), while EC was more often selected for stage II and III disease. Additionally, a higher proportion of EC patients received adjuvant chemotherapy (26% vs. 23%, p<0.01).

Post-Matching Characteristics

After 1:1 PSM, 7.904 patients remained in each group (Table 2). Baseline characteristics were well balanced. Mean age was comparable between EC and SC groups (71±12 vs. 70±12 years, p=0.53), and male gender distribution was identical (48% in both groups, p=0.83). Tumor grades were similarly distributed, with moderately differentiated tumors being the most common (75% vs. 73%, p=0.08). Stage distribution and receipt of chemotherapy were also equivalent (tumor stage, p=0.78; chemotherapy, p=0.30). Notably, EC remained associated with a higher rate of adequate lymph node retrieval (>12 nodes: 94% vs. 89%, p<0.01) (Table 3).

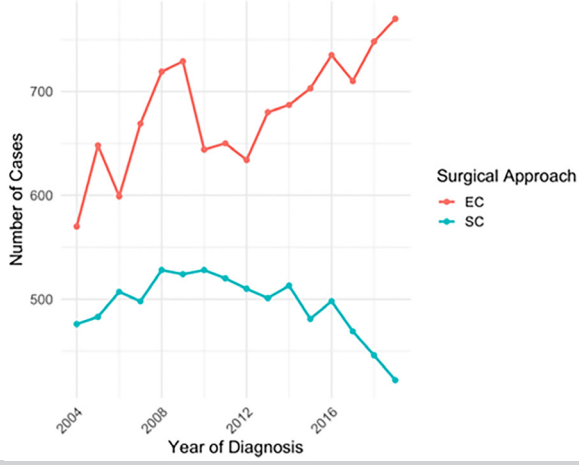

Figure 2. Distribution of surgical approaches performed over study periods.

EC: Extended colectomy, SC: Segmental colectomy

Table 1. Comparison of demographics and pathological characteristics of patients with transverse adenocarcinoma between extended and segmental colectomy

		Extended colectomy n=10,895 (58%)	Segmental colectomy n=7.904 (42%)	p-value
Age	Mean ± SD	69±13	70±12	<0.01
	Median (IQR)	71 (19)	72 (18)	
Gender	Male	5465 (50)	3788 (48)	0.003
Ethnicity	Caucasian	8704 (81.4)	6409 (83.1)	0.009
	African-American	1285 (12.0)	826 (10.0)	
	Other/unknown	906 (6.6)	669 (6.9)	
Marital status at diagnosis	Partnered	5868 (54)	4215 (53)	0.69
	Unpartnered	4570 (42)	3343 (42)	
	Unknown	457 (4)	346 (5)	
Grade	Well differentiated	1008 (9)	853 (11)	<0.01
	Moderately differentiated	7877 (72)	5800 (73)	
	Poorly differentiated	1785 (16)	1106 (14)	
	Undifferentiated	225 (2)	145 (2)	
Stage	Stage I	2815 (26)	2444 (31)	<0.01
	Stage II	4646 (42)	3088 (39)	
	Stage III	3434 (32)	2372 (30)	
Chemotherapy	Yes	2808 (26)	1813 (23)	<0.01

Data are expressed as number (percentage) or mean ± SD. IQR: Interquartile range, SD: Standard deviation.

Table 2. Demographics and pathological characteristics of patients with transverse adenocarcinoma by surgical approach after matching

		Extended colectomy n=7.904	Segmental colectomy n=7.904	p-value
Age	Mean ± SD	71±12	70±12	0.53
	Median (IQR)	73 (18)	72 (18)	
Sex	Male	3802 (48)	3788 (48)	0.83
Race	Caucasian	6343 (80.2)	6409 (83.1)	0.18
	African-American	866 (11.0)	826 (10.0)	
	Other/unknown	695 (8.8)	669 (6.9)	
Marital status at diagnosis	Partnered	4180 (53)	4215 (53)	0.55
	Unpartnered	3398 (43)	3343 (42)	
	Unknown	326 (4)	346 (5)	
Grade	Well differentiated	781(10)	853 (11)	0.08
	Moderately differentiated	5891 (75)	5800 (73)	
	Poorly differentiated	1114 (14)	1106 (14)	
	Undifferentiated	118 (1)	145 (2)	
Stage	Stage I	2404 (30)	2444 (31)	0.78
	Stage II	3119 (40)	3088 (39)	
	Stage III	2381 (30)	2372 (30)	
Chemotherapy	Yes	1759 (22)	1813 (23)	0.3

Data are expressed as number (percentage) or mean ± SD. IQR: Interquartile range, SD: Standard deviation.

Survival Analysis

Figure 3 displays Kaplan-Meier survival curves comparing surgical approaches.

Panel A shows 5-year OS, which did not differ significantly between EC and SC (65.6% vs. 66.9%, p=0.074).

Panel B illustrates 5-year CSS, where SC was associated with a significantly improved outcome compared to EC (84.3% vs. 81.7%, p<0.01). The median survival time was 55 months (IQR: 26-101) for the EC group and 60 months (IQR: 29-106) for the SC group, and this difference did not reach statistical significance (p=0.07, log-rank test).

Multivariable Analysis

Multivariable Cox proportional hazards modeling identified several independent predictors of CSS (Table 4). SC was associated with a lower risk of cancer-specific mortality compared to EC (HR =0.8376, p<0.001). Additional independent predictors of poorer CSS included increasing age (HR =1.0316 per year, p<0.001), male gender (HR =1.0864, p=0.0305), higher tumor grade, advanced stage (both p<0.001), and greater lymph node yield, which was associated with improved survival.

DISCUSSION

This large, population-based study compared EC and SC in patients with transverse colon adenocarcinoma, utilizing data from over 18,000 individuals. The findings revealed a clear temporal shift in surgical practice, with increasing use of EC and a corresponding decline in SC after 2010. This trend may reflect heightened concerns regarding oncologic adequacy, particularly in relation to lymph node staging and margin clearance.

Table 3. Comparison of lymph node retrieval and median survival time between surgical approaches

		Extended colectomy n=7.904	Segmental colectomy n=7.904	p-value
Number of retrieved regional lymph node	<12 nodes	481 (6.1)	858 (10.9)	<0.01
	12-16 nodes	2154 (27.2)	2595 (32.8)	
	17+ nodes	5240 (66.3)	4421 (55.9)	
	Unknown/missing	29 (0.4)	30 (0.4)	
	Mean ± SD	21±12	15±9	
	Median (IQR)	18 (13-25)	14 (9-18)	
Median survival time, months		55 (26-101)	60 (29-106)	0.07

Data are expressed as number (percentage) or median (interquartile). IQR: Interquartile range, SD: Standard deviation.

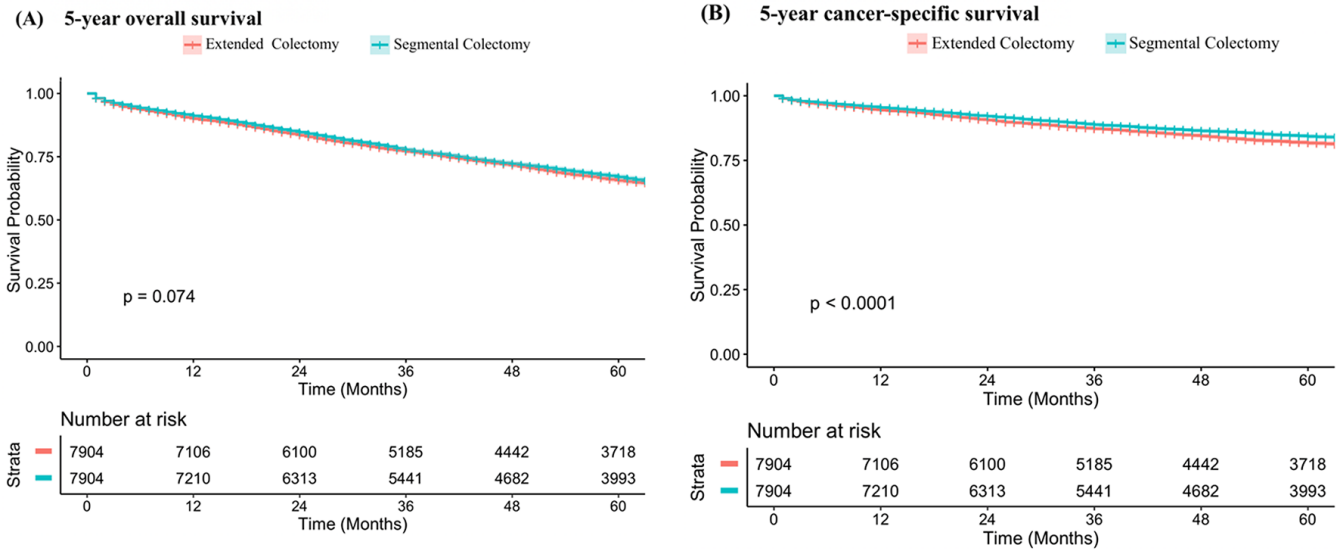

Figure 3. Kaplan-Meier estimates of 5-year overall and cancer-specific survival by resection type after matched analysis. **(A)** Five-year overall survival: EC 65.6% vs. SC 66.9% (p=0.074). HR =0.9574 (95% CI: 0.9081-1.0090), **(B)** Five-year cancer-specific survival: EC 81.7% vs. SC 84.3% (p<0.01). HR =0.8376 (95% CI: 0.7748-0.9057). Survival probabilities estimated by the Kaplan-Meier method; HRs and 95% CIs derived from multivariable Cox proportional hazards models.

EC: Extended colectomy, SC: Segmental colectomy, CI: Confidence interval, HRs: Hazard ratios

Table 4. Multivariable Cox regression results for cancer-specific survival

Variable	Hazard ratio	Lower-95-CI	Upper-95-CI	p-value
Surgical approach (SC vs. EC)	0.8376	0.7771	0.9029	<0.001
Age (per year increase)	1.0316	1.0277	1.0354	<0.001
Sex (male vs. female)	1.0864	1.0078	1.1712	0.0305
Grade G2 (vs. G1)	1.0661	0.9207	1.2344	0.3922
Grade G3 (vs. G1)	1.396	1.1851	1.6445	<0.0001
Grade G4 (vs. G1)	1.4082	1.0703	1.8528	0.0145
Stage II (vs. Stage I)	2.1758	1.9235	2.4613	<0.001
Stage III (vs. Stage I)	5.8368	5.1337	6.6363	<0.001
Chemotherapy (yes vs. no)	0.7793	0.706	0.8602	<0.001
12-16 Lymph nodes examined	0.8137	0.7088	0.9341	0.0034
17+ Lymph nodes examined	0.7998	0.7026	0.9105	<0.0001

SC: Segmental colectomy, EC: Extended colectomy, CI: Confidence interval, G: Grade of differentiation.
Note: The number of retrieved regional lymph nodes with unknown information was excluded from the multivariable Cox regression model due to its representation of missing or unknown data, which does not provide meaningful information for analysis.

Prior to PSM, SC was more frequently performed in older patients and those with early-stage or well-differentiated tumors, whereas EC was more common in patients with advanced-stage disease and more frequently accompanied by adjuvant chemotherapy—suggesting a more aggressive treatment strategy in the EC cohort. Even after matching, EC remained associated with higher rates of adequate lymph node retrieval (>12 nodes), likely due to the wider resection field inherent to the procedure.

Despite this, OS did not differ significantly between the groups. Interestingly, CSS was modestly but significantly better in the SC cohort. This may reflect favorable tumor biology, earlier stage, and lower perioperative risk in SC patients. These results challenge the assumption that more extensive resections inherently yield better oncologic outcomes, supporting the notion that, for selected patients, SC may offer equivalent or even superior long-term disease control.

The preference for EC in clinical practice may be driven by the anatomical complexity of the transverse colon and its proximity to major vascular structures. However, accumulating evidence—including the present study—supports the oncologic safety of SC when adequate lymphadenectomy is achieved, especially in cases with favorable biological features (7,11). The dual embryologic origin and variable lymphatic drainage of the transverse colon further complicate efforts to standardize surgical management. Thus, a uniform surgical strategy is unlikely to be appropriate in all cases. Surgical planning should instead be individualized, considering tumor location, anatomical complexity, and surgeon experience.

Our findings are consistent with previous analyses from the National Cancer Database and international cohorts, several of which have questioned the superiority of EC. Notably, poorer outcomes have been reported in some studies for EC, particularly in mid-transverse tumors and stage III disease (6,12), reinforcing the importance of tailored, biology-driven surgical approaches.

Anatomical variability—especially regarding the middle colic vessels and drainage patterns involving the right and left colic arteries—poses further challenges to standardization (13-16). Additionally, real-world clinical factors such as emergency presentation, patient frailty, and anesthetic risk often influence surgical decision-making and may appropriately lead to the selection of SC in certain contexts (16,17).

Although the absolute 5-year CSS difference between SC and EC was approximately 2.6%, this finding should be interpreted in both clinical and population-level contexts. At the individual patient level, the difference may appear modest; however, when extrapolated to large populations, even small absolute gains in survival can translate into a considerable number of lives saved over time. Furthermore, SC is generally a less extensive procedure than EC and may be associated with reduced operative time, lower perioperative morbidity, and faster recovery, making even a modest improvement in CSS clinically meaningful. The observed difference, combined with the procedural advantages of SC, supports the consideration of this approach in appropriately selected patients. It is also important to note that this effect persisted after multivariable adjustment for known prognostic factors, suggesting that the survival benefit is not solely attributable to baseline differences between patient groups.

While PSM was applied to balance stage and other measured covariates, the observed superior CSS in the SC group may be influenced by unmeasured factors not recorded in the SEER

database. In real-world surgical practice, extended resections are often chosen for tumors with more aggressive biological behavior, technically demanding locations, or advanced stage, whereas SC is typically performed for smaller, less aggressive tumors. Such underlying differences could contribute to residual confounding and may partially explain the apparent survival advantage of SC. As this is an observational study, the findings should be interpreted with caution, and prospective studies incorporating detailed clinicopathological and operative data are needed to confirm these results.

Study Limitations

A major strength of this study is the use of PSM, which minimized baseline imbalances and improved comparability between treatment groups. This statistical approach enhances the internal validity of retrospective registry analyses. Nonetheless, several limitations must be acknowledged. This study is subject to several inherent limitations associated with the SEER database. Important clinical variables, including margin status, urgency of surgery (emergency vs. elective), and the presence of lymphovascular or perineural invasion, are not captured. The absence of these data may influence the interpretation of oncological outcomes, as they are recognized prognostic factors in colorectal cancer. In addition, the PSM model in our analysis incorporated only age, sex, stage, grade, and chemotherapy status. The omission of other clinicopathological parameters, such as tumor size and additional histopathological features, may introduce residual confounding and selection bias. Furthermore, the SEER database does not provide information on surgical intent, detailed tumor location, or molecular tumor characteristics, which could also influence surgical decision-making. These unmeasured factors may partially account for the observed differences in CSS between the EC and SC groups, and their absence underscores the need for cautious interpretation. These limitations should be considered when interpreting the results, and future prospective studies with more comprehensive datasets are warranted to validate our findings.

CONCLUSION

In this comprehensive population-based analysis of patients with transverse colon adenocarcinoma, EC was more frequently employed, particularly in cases with advanced disease. However, SC provided comparable—and in certain subgroups, superior—CSS outcomes. These findings highlight the importance of personalized surgical decision-making that incorporates tumor biology, anatomical considerations, and patient-specific risk factors. Prospective, multi-institutional studies are needed to refine selection criteria and confirm the oncologic safety of SC for this anatomically and embryologically distinct region of the colon. In this population-based analysis, SC was associated with a modest CSS advantage compared to extended colectomy. However, given the observational design and the potential influence of unmeasured confounding factors, these results should not be interpreted as definitive evidence of the oncological superiority of SC. Further prospective, well-controlled studies are required to clarify the impact of surgical extent on long-term outcomes in transverse colon cancer.

Ethics

Ethics Committee Approval: The study protocol was reviewed and approved by the Ethics Committee of Acıbadem University (approval number: 2025-09/352, date: 12.06.2025).

Informed Consent: Informed consent was obtained from patients.

Footnotes

Author Contributions

Concept - Ç.B., A.A., E.G.; Design - Ç.B., A.A., E.G.; Data Collection or Processing - Ç.B., M.E., E.G., D.A., B.B.; Analysis or Interpretation - Ç.B., A.A., V.Ö., D.A.; Literature Search - Ç.B., M.E., A.A., E.G., D.A., B.B.; Writing - Ç.B., M.E., A.A., V.Ö., D.A., B.B.

Conflict of Interest: No conflict of interest was declared by the authors.

Financial Disclosure: The authors declared that this study received no financial support.

REFERENCES

1. *Benlice C, Elhan AH, Seker ME, Gorgun E, Kuzu MA. Oncologic outcomes and trends in each colon cancer location and stages over the last two decades: insights from the SEER registry. Tech Coloproctol. 2024;28:147.*
2. *Guillou PJ, Quirke P, Thorpe H, Walker J, Jayne DG, Smith AM, et al. Short-term endpoints of conventional versus laparoscopic-assisted surgery in patients with colorectal cancer (MRC CLASICC trial): multicentre, randomised controlled trial. Lancet. 2005;365:1718-1726.*
3. *Colon Cancer Laparoscopic or Open Resection Study Group; Buunen M, Veldkamp R, Hop WC, Kuhry E, Jeekel J, et al. Survival after laparoscopic surgery versus open surgery for colon cancer: long-term outcome of a randomised clinical trial. Lancet Oncol. 2009;10:44-52.*
4. *Ueki T, Nagai S, Manabe T, Koba R, Nagayoshi K, Nakamura M, et al. Vascular anatomy of the transverse mesocolon and bidirectional laparoscopic D3 lymph node dissection for patients with advanced transverse colon cancer. Surg Endosc. 2019;33:2257-2266.*
5. *Morarasu S, Clancy C, Cronin CT, Matsuda T, Heneghan HM, Winter DC. Segmental versus extended colectomy for tumours of the transverse colon: a systematic review and meta-analysis. Colorectal Dis. 2021;23:625-634.*
6. *Crippa J, Grass F, Achilli P, Behm KT, Mathis KL, Day CN, et al. Surgical approach to transverse colon cancer: analysis of current practice and oncological outcomes using the national cancer database. Dis Colon Rectum. 2021;64:284-292.*
7. *Kim HJ, Park JW. Surgical outcomes of various surgical approaches for transverse colon cancer. J Minim Invasive Surg. 2022;25:1-6.*
8. *Martínez-Pérez A, Reitano E, Gavriilidis P, Genova P, Moroni P, Memeo R, et al. What is the best surgical option for the resection of transverse colon cancer? Ann Laparosc Endosc Surg. 2019;4:69.*
9. *Roy MK, Pipara A, Kumar A. Surgical management of adenocarcinoma of the transverse colon: what should be the extent of resection? Ann Gastroenterol Surg. 2020;5:24-31.*
10. *Leijssen LGJ, Dinaux AM, Amri R, Kunitake H, Bordeianou LG, Berger DL. A transverse colectomy is as safe as an extended right or left colectomy for mid-transverse colon cancer. World J Surg. 2018;42:3381-3389.*

11. *Milone M, Manigrasso M, Elmore U, Maione F, Gennarelli N, Rondelli F, et al. Short- and long-term outcomes after transverse versus extended colectomy for transverse colon cancer. A systematic review and meta-analysis. Int J Colorectal Dis. 2019;34:201-207.*
12. *Guan XU, Zhao Z, Yang M, Chen H, Chen W, Liu Z, et al. Whether partial colectomy is oncologically safe for patients with transverse colon cancer: a large population-based study. Oncotarget. 2017;8:93236-93244.*
13. *Park HM, Lee J, Lee SY, Kim CH, Kim HR. Distribution of lymph node metastasis and oncological outcomes of mid-transverse colon cancer: extended versus transverse colectomy. Colorectal Dis. 2021;23:2007-2013.*
14. *Piozzi GN, Rusli SM, Baek SJ, Kwak JM, Kim J, Kim SH. Infrapyloric and gastroepiploic node dissection for hepatic flexure and transverse colon cancer: a systematic review. Eur J Surg Oncol. 2022;48:718-772.*
15. *Chong CS, Huh JW, Oh BY, Park YA, Cho YB, Yun SH, et al. Operative method for transverse colon carcinoma: transverse colectomy versus extended colectomy. Dis Colon Rectum. 2016;59:630-639.*
16. *Su H, Xie S, Wang S, Huang L, Lyu J, Pan Y. New findings in prognostic factor assessment for adenocarcinoma of transverse colon: a comparison study between competing-risk and COX regression analysis. Front Med (Lausanne). 2024;11:1301487.*
17. *Su H, Wang S, Xie S, Huang L, Pan Y, Lyu J. Prediction of death probability in adenocarcinoma of the transverse colon: competing-risk nomograms based on 21,469 patients. J Cancer Res Clin Oncol. 2023;149:10435-10452.*