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Impact of Surgical Strategy on Perioperative Outcomes, Time to Adjuvant Chemotherapy, and Quality of Life in Malignant Colon Obstruction: A Nationwide Prospective Multicenter Cohort Study

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Abstract

Background.

Malignant colon obstruction is a surgical emergency, and the operating surgeon often has to choose an operative strategy quickly under unfavourable physiological conditions. Whether the choice between primary anastomosis, resection with stoma, combined anastomosis with diverting stoma, or diverting stoma alone influences perioperative outcomes and the interval to adjuvant chemotherapy is still unclear. We addressed these questions in a national prospective cohort and also followed health-related quality of life (HRQoL) over the first postoperative year.

Methods.

Patients undergoing surgery for malignant colon obstruction were enrolled across 13 tertiary centers in Türkiye (NCT05429060). Standardized perioperative data were collected, and HRQoL was assessed with the EORTC QLQ-CR29 instrument preoperatively and at 3 and 12 months. Outcomes were compared across the four surgical strategies using one-way ANOVA for continuous variables and the χ^2 or Fisher–Freeman–Halton exact test for categorical variables. Time to chemotherapy was analyzed both as a continuous variable and dichotomized at a 30-day threshold.

Results.

Of 174 patients enrolled, 165 met inclusion criteria (mean age 65.4 ± 13.1 years; 54.5% male). Resection with primary anastomosis was most common (50.3%), followed by resection with stoma (24.8%), combined anastomosis with stoma (13.3%), and diverting stoma without resection (11.5%). Advanced-disease markers—metastasis, perforation, carcinomatosis, and peritonitis—were significantly more frequent in the diverting-stoma and resection-with-stoma groups (all $p \leq 0.012$). Operation time differed markedly across techniques (84.7 to 207.6 minutes; $p < 0.001$), whereas postoperative complications (35.2% overall), reoperation (6.1%), and early mortality (9.7%) did not differ significantly. Adjuvant chemotherapy was initiated in 68.5% of patients at a mean of 29.1 ± 15.8 days; neither the mean interval ($p = 0.194$) nor the rate of delay beyond 30 days ($p = 0.646$) differed by surgical strategy. HRQoL scores improved from baseline to 12 months across symptom and functional domains, without significant between-technique differences at any timepoint.

Conclusions.

In malignant colon obstruction, the surgical strategy reflects disease severity and operative complexity, but is not independently associated with the timing of adjuvant chemotherapy or with medium-term quality of life. Diverting stoma without resection was linked to numerically earlier chemotherapy, most

likely because of the lower physiological burden rather than a causal advantage. Individualised decision-making and close multidisciplinary coordination remain central to optimising outcomes.

Trial registration

ClinicalTrials.gov NCT05429060.

1. Introduction

Mechanical bowel obstruction caused by colorectal cancer is one of the commonest oncological emergencies. It complicates between 7% and 29% of colorectal cancers at presentation and disproportionately affects older patients with left-sided tumours [1, 2]. The combination of an obstructed, unprepared bowel, the systemic effects of acute obstruction, and the high frequency of advanced disease places these patients at substantially higher risk of postoperative morbidity and mortality than those undergoing elective resection. In a recent meta-analysis, emergency colorectal resection carried an approximately 4.6-fold higher 30-day mortality and a 1.8-fold higher complication risk compared with elective surgery [3, 4]. Large multicentre and population-based series have repeatedly confirmed this elevated risk profile, with in-hospital mortality of 6–13% and major morbidity above 30% after emergency colorectal surgery [5, 6, 7].

The acute presentation compresses the window for preoperative optimisation and staging. Operative decisions therefore rest on the patient's physiological status, the intraoperative findings, and the surgeon's judgement, often in an out-of-hours setting [8]. The central technical question is whether to restore intestinal continuity with a primary anastomosis or to avoid or protect that anastomosis with a stoma. Each option carries its own trade-offs: the immediate risk of anastomotic failure on one hand, and the longer-term burden of stoma care and the need for reversal surgery on the other [9, 10]. International guidelines, including those of the World Society of Emergency Surgery, accordingly endorse an individualised approach in which a diverting stoma or a bridge-to-surgery strategy may be preferred for high-risk patients with left-sided obstruction [1, 11].

Beyond the immediate perioperative period, the timely start of adjuvant chemotherapy is a recognised determinant of oncological outcome in stage III and high-risk stage II colon cancer [12, 13]. A large SEER–Medicare analysis of 18,491 patients showed that starting chemotherapy beyond eight weeks was independently associated with worse overall survival, with the hazard rising progressively as the delay lengthened; treatment within five to eight weeks gave equivalent survival to earlier initiation [14]. Two meta-analyses similarly showed that each four-week delay produces a measurable reduction in overall and disease-free survival [12, 15]. In emergency practice, postoperative complications, slow recovery, and stoma-related problems can all plausibly delay systemic therapy; postoperative complications alone have been linked to a more than fourfold increase in the odds of delayed adjuvant treatment [16, 17]. Despite this, the effect of the specific operative strategy on this interval is poorly characterised. Some authors have argued that a diverting stoma, by avoiding an at-risk anastomosis,

shortens recovery and accelerates chemotherapy [18, 19]; others have raised the opposite concern, that stoma-related morbidity and the need for additional procedures may instead prolong it [10, 20].

Health-related quality of life is an equally important but less frequently reported endpoint in this population, particularly given the high prevalence of permanent or temporary stomas and the advanced stage of disease at presentation. Disease- and treatment-specific instruments such as the EORTC QLQ-CR29 allow systematic, longitudinal capture of the patient's perspective across symptom, functional, and stoma-specific domains [21, 22], and have been incorporated into landmark trials of obstruction management [23].

Against this background, we conducted a nationwide, prospective, multicentre cohort study of patients undergoing surgery for malignant colon obstruction in Türkiye. The primary aim was to test whether surgical strategies involving a diverting stoma are associated with a shorter interval to adjuvant chemotherapy. Secondary aims were to describe perioperative outcomes across the four principal operative strategies and to follow health-related quality of life over the first postoperative year.

2. Materials and Methods

2.1 Study design and oversight

This was a prospective, observational, multicenter cohort study conducted across 13 tertiary referral centers in different geographic regions of Türkiye, selected to reflect a range of clinical practices and patient populations. The study was registered at ClinicalTrials.gov (NCT05429060) and approved by the institutional ethics committee of each participating center. It was conducted in accordance with the Declaration of Helsinki and Good Clinical Practice guidelines, and all participants provided written informed consent. Reporting follows the STROBE statement for observational cohort studies [24].

2.2 Participants

Consecutive adult patients undergoing emergency or urgent surgery for mechanical large-bowel obstruction attributable to a histologically confirmed colonic adenocarcinoma were eligible. Patients were excluded according to predefined criteria, including obstruction from a non-colonic or benign cause, incomplete operative documentation, or absence of baseline assessment. Of 174 patients initially enrolled, nine were excluded, yielding a final analytic cohort of 165 patients.

2.3 Data collection and definitions

At the index operation, investigators completed a standardized electronic case report form capturing demographic data (age, sex), comorbidity and American Society of Anesthesiologists (ASA) physical status, presenting symptoms, laboratory and imaging findings, and whether a self-expanding metallic stent had been attempted before surgery. Tumor location, clinical stage, and intraoperative findings—including perforation, peritonitis, peritoneal carcinomatosis, and distant metastasis—were recorded. For

the present analysis, ASA physical status was dichotomized as ASA 1–2 (no significant comorbidity) versus ASA 3–4 (comorbidity present).

Four operative strategies were prospectively categorized: (1) diverting stoma without resection; (2) resection with primary anastomosis; (3) resection with primary anastomosis and a protective diverting stoma; and (4) resection with end-stoma formation (e.g., Hartmann's procedure). Operation time, estimated intraoperative blood loss, postoperative complications and their management, reoperation, hospital length of stay, and in-hospital (early) mortality were recorded. Time to adjuvant chemotherapy was defined as the interval in days from surgery to the documented date of first chemotherapy administration; receipt of chemotherapy was defined by the presence of a recorded initiation date. Delayed chemotherapy was prespecified as initiation more than 30 days after surgery.

2.4 Quality-of-life assessment

Health-related quality of life was assessed using the EORTC QLQ-CR29 colorectal module [21]. Patients completed the instrument before surgery and at 3 and 12 months postoperatively, the follow-up assessments being conducted by structured telephone interview together with the collection of data on complications, readmissions, reoperations, and chemotherapy timing. Subscale scores were computed using the standard EORTC scoring procedure and linearly transformed to a 0–100 scale, with higher functional scores indicating better function and higher symptom scores indicating greater symptom burden [22].

2.5 Statistical analysis

Continuous variables are summarized as mean ± standard deviation and categorical variables as counts and percentages calculated on non-missing observations. Comparisons across the four surgical strategies used one-way analysis of variance (ANOVA) for continuous variables and the Pearson χ^2 test for categorical variables; where expected cell counts were below five, the Fisher–Freeman–Halton exact test was applied using a Monte Carlo approximation with 20,000 replicates. For quality-of-life analyses, an overall (whole-cohort) estimate at each timepoint was derived as the pooled mean and standard deviation across surgical groups, combining within-group and between-group variance. A two-sided p value below 0.05 was considered statistically significant. Analyses were performed in Python (SciPy) and cross-checked in standard statistical software.

3. Results

3.1 Cohort characteristics

The final cohort comprised 165 patients with a mean age of 65.4 ± 13.1 years; 90 (54.5%) were male and 75 (45.5%) female. Comorbidity corresponding to ASA 3–4 was present in 104 patients (63.0%). Surgery was open in 151 patients (91.5%) and laparoscopic in 14 (8.5%). The most frequent tumour locations were the rectosigmoid (23.0%) and sigmoid colon (30.9%), consistent with the left-sided predominance typical of obstructing colorectal cancer [1, 2]. Resection with primary anastomosis was the commonest

strategy (83 patients, 50.3%), followed by resection with stoma (41, 24.8%), resection with anastomosis and protective stoma (22, 13.3%), and diverting stoma without resection (19, 11.5%). Markers of advanced disease were common: perforation in 18 patients (10.9%), peritonitis in 16 (9.7%), peritoneal carcinomatosis in 16 (9.7%), and distant metastasis in 43 (26.1%), the liver being the dominant metastatic site. Baseline and perioperative characteristics for the whole cohort are summarised in Table 1.

Table 1
Baseline, operative, and postoperative characteristics of the whole cohort (N = 165).

Characteristic	Value	n
Age, years — mean ± SD	65.4 ± 13.1	165
Sex, male — n (%)	90 (54.5)	165
Sex, female — n (%)	75 (45.5)	165
ASA 3–4 (comorbidity present) — n (%)	104 (63.0)	165
Tumor location — n (%)		
Rectosigmoid	38 (23.0)	165
Sigmoid colon	51 (30.9)	165
Descending colon	20 (12.1)	165
Splenic flexure	8 (4.8)	165
Transverse colon	12 (7.3)	165
Hepatic flexure	12 (7.3)	165
Ascending colon	7 (4.2)	165
Cecum	17 (10.3)	165
Surgical technique — n (%)		
Resection with anastomosis	83 (50.3)	165
Resection with stoma	41 (24.8)	165
Resection with anastomosis + stoma	22 (13.3)	165
Diverting stoma without resection	19 (11.5)	165
Laparoscopic approach — n (%)	14 (8.5)	165
Perforation — n (%)	18 (10.9)	165
Peritonitis — n (%)	16 (9.7)	165
Peritoneal carcinomatosis — n (%)	16 (9.7)	165
Distant metastasis — n (%)	43 (26.1)	165
Operation time, min — mean ± SD	160.4 ± 65.2	162
Estimated blood loss, mL — mean ± SD	154.1 ± 164.3	158

Data are mean ± SD or n (%). Percentages are calculated on non-missing observations; the n column indicates the number of patients with available data. ASA, American Society of Anesthesiologists physical status.

Characteristic	Value	n
Hospital stay, days — mean ± SD	9.5 ± 6.2	161
Postoperative complication — n (%)	58 (35.2)	165
Reoperation — n (%)	10 (6.1)	165
Early (in-hospital) mortality — n (%)	16 (9.7)	165
Received adjuvant chemotherapy — n (%)	113 (68.5)	165
Time to chemotherapy, days — mean ± SD	29.1 ± 15.8	113

Data are mean ± SD or n (%). Percentages are calculated on non-missing observations; the n column indicates the number of patients with available data. ASA, American Society of Anesthesiologists physical status.

3.2 Perioperative outcomes by surgical strategy

Comparison across the four operative strategies is shown in Table 2. The groups were similar in age, sex, and comorbidity burden. Indicators of advanced disease, in contrast, were strongly patterned by technique: metastasis ($p = 0.010$), perforation ($p = 0.012$), carcinomatosis ($p = 0.007$), and peritonitis ($p = 0.003$) were all most frequent in the diverting-stoma and resection-with-stoma groups, and least frequent in the resection-with-anastomosis group. This gradient is clinically coherent and suggests that surgeons reserved anastomosis avoidance for the most contaminated or advanced presentations.

Table 2
Comparison of perioperative outcomes and adjuvant chemotherapy by surgical technique.

Variable	Diverting stoma (n = 19)	Resection + stoma (n = 41)	Resection + anastomosis (n = 83)	Resection + anast. + stoma (n = 22)	p
Age, years	68.2 ± 12.2	66.8 ± 12.5	64.4 ± 14.3	64.5 ± 10.0	0.612
Male sex — n (%)	12 (63.2)	22 (53.7)	42 (50.6)	14 (63.6)	0.607
ASA 3–4 — n (%)	12 (63.2)	28 (68.3)	48 (57.8)	16 (72.7)	0.505
Metastasis — n (%)	10 (52.6)	13 (31.7)	14 (16.9)	6 (27.3)	**0.010**
Perforation — n (%)	4 (21.1)	9 (22.0)	4 (4.8)	1 (4.5)	**0.012**
Carcinomatosis — n (%)	5 (26.3)	7 (17.1)	3 (3.6)	1 (4.5)	**0.007**
Peritonitis — n (%)	2 (10.5)	10 (24.4)	2 (2.4)	2 (9.1)	**0.003**
Laparoscopy — n (%)	3 (15.8)	0 (0.0)	8 (9.6)	3 (13.6)	0.105
Operation time, min	84.7 ± 44.4	165.1 ± 53.6	162.6 ± 56.3	207.6 ± 80.0	**< 0.001**
Blood loss, mL	101.9 ± 92.1	160.9 ± 231.1	150.8 ± 128.5	201.2 ± 179.2	0.315
Hospital stay, days	8.4 ± 5.5	9.8 ± 5.9	8.8 ± 4.3	12.4 ± 10.9	0.084
Complication — n (%)	9 (47.4)	16 (39.0)	25 (30.1)	8 (36.4)	0.484
Reoperation — n (%)	2 (10.5)	2 (4.9)	5 (6.0)	1 (4.5)	0.857
Early mortality (< 30 days) — n (%)	4 (21.1)	4 (9.8)	7 (8.4)	1 (4.5)	0.312
Received chemo — n (%)	9 (47.4)	29 (70.7)	56 (67.5)	19 (86.4)	0.062
Time to chemo, days	18.6 ± 13.6	28.4 ± 16.2	30.5 ± 14.0	30.7 ± 20.0	0.194
Delayed chemo > 30 d — n (%)	2 (22.2)	8 (27.6)	22 (39.3)	7 (36.8)	0.646

Data are mean ± SD or n (%). Continuous variables compared by one-way ANOVA; categorical variables by χ^2 or Fisher–Freeman–Halton exact test (Monte Carlo) when expected counts were < 5. Significant p values (< 0.05) are shown in bold. Chemotherapy timing and delay were assessed among patients who received chemotherapy (n = 113).

Operation time varied substantially between strategies, ranging from 84.7 ± 44.4 minutes for diverting stoma without resection to 207.6 ± 80.0 minutes for combined resection with anastomosis and stoma ($p < 0.001$), reflecting the different technical demands of each procedure. Estimated blood loss, hospital

stay, postoperative complications (35.2% overall), reoperation (6.1%), and early mortality (9.7%) did not differ significantly between groups, although early mortality was numerically highest after diverting stoma without resection (21.1%), again consistent with selection of this approach for the sickest patients.

3.3 Time to adjuvant chemotherapy

Adjuvant chemotherapy was started in 113 of 165 patients (68.5%), at a mean of 29.1 ± 15.8 days after surgery. Stratified by surgical strategy, the mean interval was 18.6 ± 13.6 days after diverting stoma, 28.4 ± 16.2 days after resection with stoma, 30.5 ± 14.0 days after resection with anastomosis, and 30.7 ± 20.0 days after combined anastomosis with stoma. The diverting-stoma group started chemotherapy numerically earliest, but the difference between groups did not reach statistical significance (ANOVA, $p = 0.194$). Using the prespecified 30-day threshold, the proportion with delayed initiation ranged from 22.2% (diverting stoma) to 39.3% (resection with anastomosis), again without a significant association with technique ($p = 0.646$). The proportion of patients who eventually received chemotherapy rose progressively across the groups, from 47.4% after diverting stoma to 86.4% after combined anastomosis with stoma, a difference of borderline significance ($p = 0.062$).

3.4 Health-related quality of life

Quality-of-life response rates declined over follow-up, reflecting both mortality and loss to follow-up: 164 patients provided a baseline EORTC QLQ-CR29 assessment, 121 at 3 months, and 119 at 12 months. Whole-cohort pooled scores for the clinically most relevant subscales are summarised in Table 3. Symptom domains improved substantially from the preoperative baseline to 3 and 12 months, most strikingly for abdominal pain (54.8 to 25.0), bloated feeling (51.8 to 20.1), and anxiety (53.5 to 28.6), consistent with relief of the obstruction and recovery from the acute illness. Functional scores such as body image also improved from baseline through 12 months. At no timepoint did any EORTC subscale differ significantly between the four surgical strategies (all $p > 0.05$), suggesting broadly comparable patient-reported recovery whichever operative approach was used.

Table 3
Whole-cohort EORTC QLQ-CR29 subscale scores over time (pooled mean ± SD).

EORTC subscale	Preop (n = 164)	3 months (n = 121)	12 months (n = 119)
Body image	69.6 ± 28.9	79.7 ± 18.9	76.1 ± 21.5
Abdominal pain	54.8 ± 28.1	29.8 ± 30.6	25.0 ± 27.9
Bloated feeling	51.8 ± 30.1	30.5 ± 29.6	20.1 ± 25.7
Anxiety	53.5 ± 28.5	32.6 ± 30.0	28.6 ± 30.3
Blood/mucus in stool	18.6 ± 22.5	13.4 ± 14.9	8.9 ± 12.1
Stool frequency	24.6 ± 25.3	17.6 ± 18.1	15.3 ± 16.0
Faecal incontinence	22.2 ± 25.9	13.9 ± 21.0	13.3 ± 17.4
Urinary frequency	25.1 ± 23.8	21.7 ± 23.4	20.2 ± 19.0
Weight	32.1 ± 28.4	27.3 ± 26.4	21.4 ± 23.6

Values are pooled mean ± SD across surgical groups at each timepoint (preoperative n = 165; 3 months n = 121; 12 months n = 119). Higher functional scores (e.g., body image) indicate better function; higher symptom scores indicate greater burden. No subscale differed significantly among surgical techniques at any timepoint.

4. Discussion

In this nationwide prospective cohort of 165 patients undergoing surgery for malignant colon obstruction, the choice of operative strategy was strongly associated with markers of disease severity and operative complexity, but not with the timing of adjuvant chemotherapy or with medium-term quality of life. Patients managed with a diverting stoma without resection started chemotherapy numerically earliest and had the shortest operations, yet they also carried the highest burden of perforation, carcinomatosis, and metastasis, and the highest early mortality. These observations fit a growing body of evidence indicating that operative strategy in the obstructed emergency setting is primarily a marker of, rather than an independent driver of, downstream oncological events [1, 2, 9].

The strong gradient we observed, with perforation, peritonitis, carcinomatosis, and metastasis concentrated in the diverting-stoma and resection-with-stoma groups (all $p \leq 0.012$), is the clearest expression of confounding by indication in our data. Surgeons selectively avoided or protected an anastomosis in precisely those patients with the most contaminated peritoneal field or the most advanced disease. This pattern is consistent with the decision frameworks endorsed by the World Society of Emergency Surgery and by French and European guidelines, which reserve primary diverting stoma and bridge-to-surgery strategies for high-risk left-sided obstruction [1, 11, 18]. The same selection logic explains why a diverting stoma without resection, despite being the least physiologically

demanding operation (mean operation time 84.7 minutes), was associated with the highest early mortality (21.1%): the procedure is chosen for patients who are least able to tolerate a definitive resection. This interpretation is in keeping with the Swedish experience reported by Öistämö and colleagues, and with the broader observation that emergency presentation and obstruction independently worsen oncological outcomes at equivalent tumour stage [2, 9, 25].

Our central finding, the absence of a statistically significant association between surgical strategy and time to chemotherapy ($p = 0.194$ for the continuous interval; $p = 0.646$ for delay beyond 30 days), should be read against this backdrop of strong confounding. The numerically shorter interval after diverting stoma (18.6 days versus around 30 days for the resection groups) is biologically plausible and echoes the rationale behind staged strategies, in which decompression by stoma or stent allows recovery, accurate staging, and a quicker return to systemic therapy [9, 18, 26]. In line with this, the Swedish cohort of Öistämö et al. reported that significantly more patients received adjuvant chemotherapy after a planned-resection-after-stoma pathway than after acute resection (43% versus 14%; $p = 0.024$) [9], and Japanese staged neoadjuvant protocols using a diverting stoma have achieved adjuvant chemotherapy delivery rates of 75% or higher [19, 26].

There is, however, an important inversion in our data: the same patients who started chemotherapy earliest after diverting stoma were also the least likely to receive it at all (47.4% versus 86.4% in the combined anastomosis-and-stoma group; $p = 0.062$). This is the key to interpreting our results. Among the subset who survived and proceeded to chemotherapy, the diverting-stoma pathway was indeed efficient; but that subset was small and heavily selected, because advanced disease and early mortality removed many such patients from the chemotherapy-eligible pool altogether. The operative decision and the oncological trajectory are therefore jointly determined by the underlying disease rather than causally linked, and a naive comparison of timing among recipients risks a survivorship bias that flatters the most selected group [27].

The overall mean interval of approximately four weeks falls comfortably within the window generally regarded as oncologically acceptable. In the large SEER–Medicare analysis by Gao et al., starting chemotherapy within eight weeks gave survival equivalent to earlier treatment, while delay beyond eight weeks was associated with progressively worse overall survival (hazard ratio 1.22 at 9–12 weeks, rising to 1.97 beyond 17 weeks) [14]. Two meta-analyses similarly quantified a measurable survival decrement for each additional four weeks of delay [12, 15]. Set against these benchmarks, the four-week mean in our cohort is reassuring. Even so, a substantial minority in every group exceeded 30 days, and nearly one-third of the surviving cohort had no documented chemotherapy start. Because postoperative complications are themselves strongly associated with delay (Fransgaard et al. reported a more than fourfold increase in the odds of delayed adjuvant treatment after complications [16], and Sun et al. specifically implicated ostomy infection, sepsis, and shock [14]), the relatively high complication burden of the obstructed population represents a tangible and modifiable target for quality improvement, particularly through structured, expedited referral of recovered patients to medical oncology.

The marked differences in operation time between strategies ($p < 0.001$) are expected and largely reflect the technical content of each procedure rather than a modifiable inefficiency. More striking is the absence of significant differences in complications (35.2% overall), reoperation (6.1%), and early mortality (9.7%), despite the concentration of advanced disease in the stoma groups. This pattern may reflect appropriate operative selection, in which anastomosis avoidance mitigated the expected excess risk in the highest-risk patients, an interpretation supported by series showing that judicious diversion reduces anastomotic-failure-related mortality in contaminated fields [4, 10]. Our overall mortality of 9.7% sits within the 6–13% range reported in large emergency colorectal series and in the international APOLLO and GlobalSurg cohorts [5, 6, 7, 28].

Laparoscopy was used in only 8.5% of our cohort and was not associated with significantly earlier chemotherapy. This is in line with the view that the urgency, distension, and contamination of malignant obstruction often preclude or limit the benefit of a minimally invasive approach, and that any reduction in length of stay it confers does not necessarily translate into earlier systemic therapy [29, 30]. Minimally invasive emergency colorectal surgery is feasible in selected patients and may reduce wound morbidity, but its role in the obstructed oncological emergency still needs to be defined by prospective trials such as LaCeS [30].

Our quality-of-life findings add a patient-centred dimension that is often absent from emergency colorectal series [17, 23]. The substantial improvement in symptom and functional domains from baseline to one year, most pronounced for abdominal pain, bloated feeling, and anxiety, is most readily explained by relief of the obstruction and convalescence from the acute illness. The lack of significant between-technique differences at any timepoint suggests that, among survivors, operative strategy does not strongly determine medium-term patient-reported outcomes. This is in keeping with the quality-of-life results of the Dutch Stent-in 2 framework and related obstruction trials, in which global health and functional scores converged over follow-up regardless of the decompression strategy [23]. The finding does carry an important caveat: the considerable attrition of the quality-of-life sample (164 at baseline, 121 at 3 months, 119 at 12 months), driven substantially by mortality, biases the later assessments toward healthier survivors and may mask early, transient disadvantages of more morbid strategies [31].

Together, these results argue against a one-size-fits-all preference for any single operative strategy on the basis of chemotherapy timing or quality of life. They support, instead, individualised, physiology- and findings-driven decision-making, coupled with systematic postoperative pathways designed to minimise avoidable delay in systemic therapy. For the high-risk obstructed patient, a staged strategy, such as a diverting stoma or stent as a bridge to elective resection, may reasonably be favoured where it allows optimisation, accurate staging, and timely chemotherapy; this approach is now being tested prospectively in randomised trials such as COMPASS [26]. For patients with favourable physiology and a clean field, primary anastomosis remains appropriate and was associated in our cohort with the lowest disease burden and a high rate of chemotherapy receipt. The proportion of patients who exceeded a 30-day interval in every group underlines the value of embedding emergency oncological patients within a multidisciplinary pathway with predefined referral milestones.

The main strengths of this study are its prospective, nationwide, multicentre design across 13 centres, the prespecified categorisation of operative strategy, and the inclusion of longitudinal patient-reported outcomes. These features improve generalisability within the Turkish health system and reduce the selection and recall biases inherent to retrospective series [24]. Several limitations should be acknowledged. First, allocation to operative strategy was non-randomised and strongly confounded by disease severity, so the observed associations are not causal, and residual confounding is likely despite the breadth of recorded covariates [27]. Second, time to chemotherapy was analysed among patients with a documented initiation date, and the reasons for non-receipt (advanced disease, early mortality, patient preference) were incompletely captured, raising the possibility of informative missingness. Third, quality-of-life follow-up was subject to substantial attrition, limiting the precision and interpretability of the later timepoints; the whole-cohort estimates were also derived as pooled means and standard deviations from group-level statistics rather than reconstructed from item-level data. Fourth, the present analysis reports short- and medium-term endpoints; long-term oncological outcomes, including disease-free and overall survival, are awaited as follow-up matures. Finally, the modest number of events for some outcomes limited statistical power to detect small but clinically relevant differences, and the single-country setting may limit transportability to health systems with different emergency-surgery and oncology pathways [28].

5. Conclusions

In this nationwide prospective cohort of malignant colon obstruction, the surgical strategy reflected disease severity and operative complexity, but was not independently associated with the timing of adjuvant chemotherapy or with medium-term quality of life. Diverting stoma without resection was linked to numerically earlier chemotherapy and shorter operations, but also to the most advanced disease and the lowest likelihood of eventually receiving systemic therapy. These findings support individualised operative decision-making guided by physiology and intraoperative findings, alongside structured postoperative pathways designed to minimise avoidable delay in adjuvant treatment [1, 14, 26]. Long-term survival and continued quality-of-life follow-up from this cohort will help to define which subgroups derive the greatest benefit from specific operative strategies.

Declarations

Ethics approval. Approved by the institutional ethics committee of each participating center; conducted per the Declaration of Helsinki and Good Clinical Practice. Trial registration ClinicalTrials.gov NCT05429060.

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Data availability. De-identified data are available from the corresponding author on reasonable request.

Author contributions. To be completed (concept, design, data acquisition, analysis, drafting, critical revision, supervision).

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