**Supplementary material 1:** Standardized enhanced recovery protocol for colotectal surgery.

For patients in the group S-ERAS, enhanced recovery after surgery (ERAS) protocol was designed and supervised by a multidisciplinary team, including surgeons, anesthesiologists and nursing staff, which included:

1. Pre-operative counseling, patient education.
2. Nutritional assessment and enteral nutrition (Supportan or Fresubin 300–500 mL) support.
3. No pre-operative bowel preparation.
4. Pre-operative fasting time: 6–8 h for solid food, 2 h for clear liquids.
5. Oral intake of 200–400 mL carbohydrate drink: up to 2–3 h before the induction of anesthesia (10% glucose solution).
7. Prevention of intraoperative hypothermia and maintenance of normothermia.
8. Intraoperative goal-directed fluid therapy and post-operative normovolemia.[25]
9. Peri-operative blood glucose control (80–150 mg/dL).
10. Multimodal prevention of post-operative nausea and vomiting (PONV) (5-HT3 receptor antagonist + dexamethasone + droperidol).
11. Prevention of post-operative DVT (physical prophylaxis combined with low molecular weight heparin administration).
13. Multimodal management of post-operative pain (PCIA, TAP, NSAIDs, COX-2 inhibitor), use of transversus abdominis plane (TAP) block (bilateral blocks with 20 mL of 0.5% ropivacaine) was recommended.
14. Recommendation of early oral intake (drink water 2 h after surgery, oral nutritional supplements on the first day after surgery, semisolid diet on the second day after surgery).
15. Recommendation of early mobilization (out-of-bed activity for 2 h on the first post-operative day and 4–6 h from the second post-operative day to discharge).
16. Removal of drainage tubes within 3 days after surgery and urinary catheter as soon as possible (within 24 h for colon surgery patients; within 48 h for rectal surgery patients).
**Figure S2:** Diagram for the implementation of pre-rehabilitation exercise.

**Table S1: I-FEED scoring for evaluation of GI function*.**

<table>
<thead>
<tr>
<th>I-FEED scoring</th>
<th>Intake</th>
<th>Feeling nauseated</th>
<th>Emesis</th>
<th>Exam</th>
<th>Duration of symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description (scoring)</td>
<td>Tolerating oral diet (0)</td>
<td>None (0)</td>
<td>None (0)</td>
<td>No distention (0)</td>
<td>0–24 h (0)</td>
</tr>
<tr>
<td>Limited tolerance (1)</td>
<td>Responsive to treatment (1)</td>
<td>≧ 1 episode of low volume (≦ 100 mL) and non-bilious (1)</td>
<td>Distension without tympany (1)</td>
<td>24–72 h (1)</td>
<td></td>
</tr>
<tr>
<td>Complete intolerance (3)</td>
<td>Resistant to treatment (3)</td>
<td>≧ 1 episode of low volume (≧ 100 mL) and bilious (3)</td>
<td>Significant distension with tympany (1)</td>
<td>&gt;72 h (2)</td>
<td></td>
</tr>
</tbody>
</table>

*Total scoring: 0–2 normal.
3–5 POGI.
≧ 6 POGD.

GI: Gastrointestinal; POGD: Post-operative gastrointestinal dysfunction; POGI: Post-operative gastrointestinal intolerance.