

Surgical and oncologic outcomes for single-port robotic versus conventional laparoscopic colectomy for colon cancer: a case-matched analysis

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Introduction

- Single-port robotic surgery (SPRS) using the da Vinci SP system has been introduced as a minimally invasive surgical approach for colon cancer, with potential benefits of reduced pain, improved cosmesis, and enhanced instrument dexterity
- We evaluated the surgical and oncological outcomes of SPRS compared to conventional multiport laparoscopic surgery (CMLS) in colon cancer surgery using a case-matched analysis

Methods

- Retrospective cohort study in single center
→ Patients who underwent surgery for colon cancer, Mar 2004 – Feb. 2025
- Propensity-score overlap weights (PSOW)**
→ Statistical methods which emphasizes patients in overlapping covariate regions, improving balance and reducing bias
- Baseline imbalances were adjusted with PSOW**

Table 1. Intraoperative and postoperative outcomes

Variables	PSOW adjusted		
	SPRS	CMLS	p-value
Operation time, min	255.0 ± 54.3	197.5 ± 55.0	< 0.001
Estimated blood loss, ml	73.0 ± 49.9	79.6 ± 88.4	0.385
Intraoperative transfusion, n (%)	0.0%	2.2%	0.036
Conversion to open surgery, n (%)	0.0%	3.1%	0.011
Overall complication, n (%)	11.2%	17.4%	0.138
Major complication ^a , n (%)	1.5%	1.4%	0.935
Days to first flatus	2.4 ± 0.9	3.4 ± 1.0	< 0.001
Days to soft diet	3.3 ± 0.9	4.8 ± 2.1	< 0.001
Opioid withdrawal ^b , n (%)	30.9%	14.0%	0.001
Post-operative hospital stay, days	7.5 ± 2.3	8.5 ± 3.3	0.001
Interval to start chemotherapy, days	23.1 ± 5.4	30.5 ± 9.5	< 0.001
30-day readmission	3.9%	1.6%	0.195

^a Major complication was defined as the Clavien-Dindo (CD) classification grade ≥ 3b

^b Opioid withdrawal is conducted when opioid overdosing symptoms were complained of and pain could be manageable with non-opioid pain killer

Results

- A total of **472 patients (CMLS, n=330; SPRS, n=142)** were included
- Baseline characteristics between groups were well balanced after case-matching
- SPRS showed better or similar intraoperative and postoperative outcomes, but had longer operative time than CMLS**
- Pathologic outcomes were comparable between groups
- Relapse-free survival (RFS) was comparable** between SPRS and CMLS (3-year RFS, 95.2% vs 95.1%; p=0.835), and **overall survival (OS) was also similar** (3-year OS, 97.2% vs 94.8%; p=0.104)

Conclusions

- SPRS is a technically and oncologically feasible surgical approach for colon cancer patients compared with CMLS
- SPRS demonstrated faster postoperative recovery and less pain**, highlighting its value as a minimally invasive strategy for colon cancer, while **maintaining oncologic outcomes relative to CMLS**

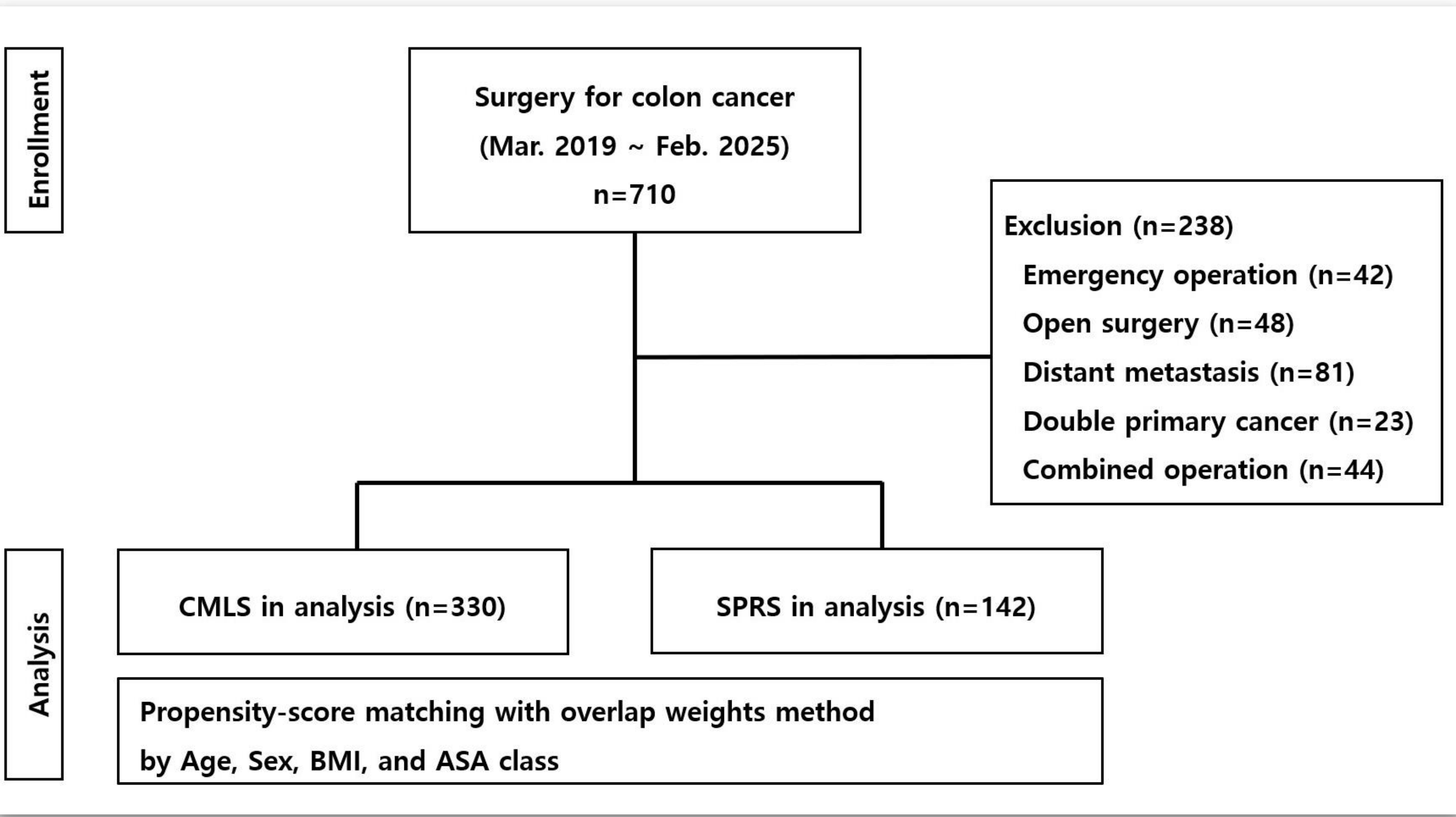


Figure 1. Flow chart of the study population

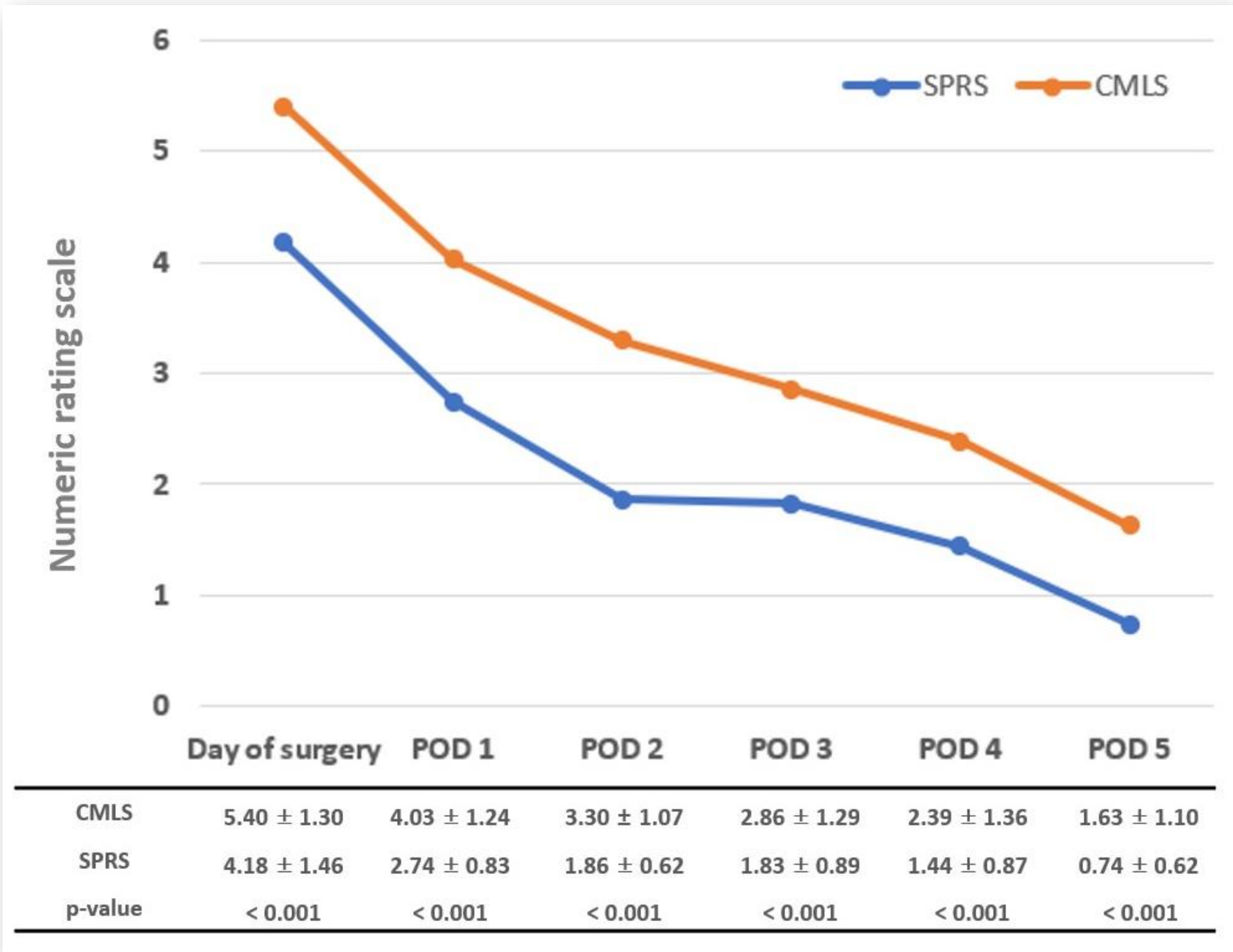


Figure 2. Postoperative Numeric Rating Scale pain scores

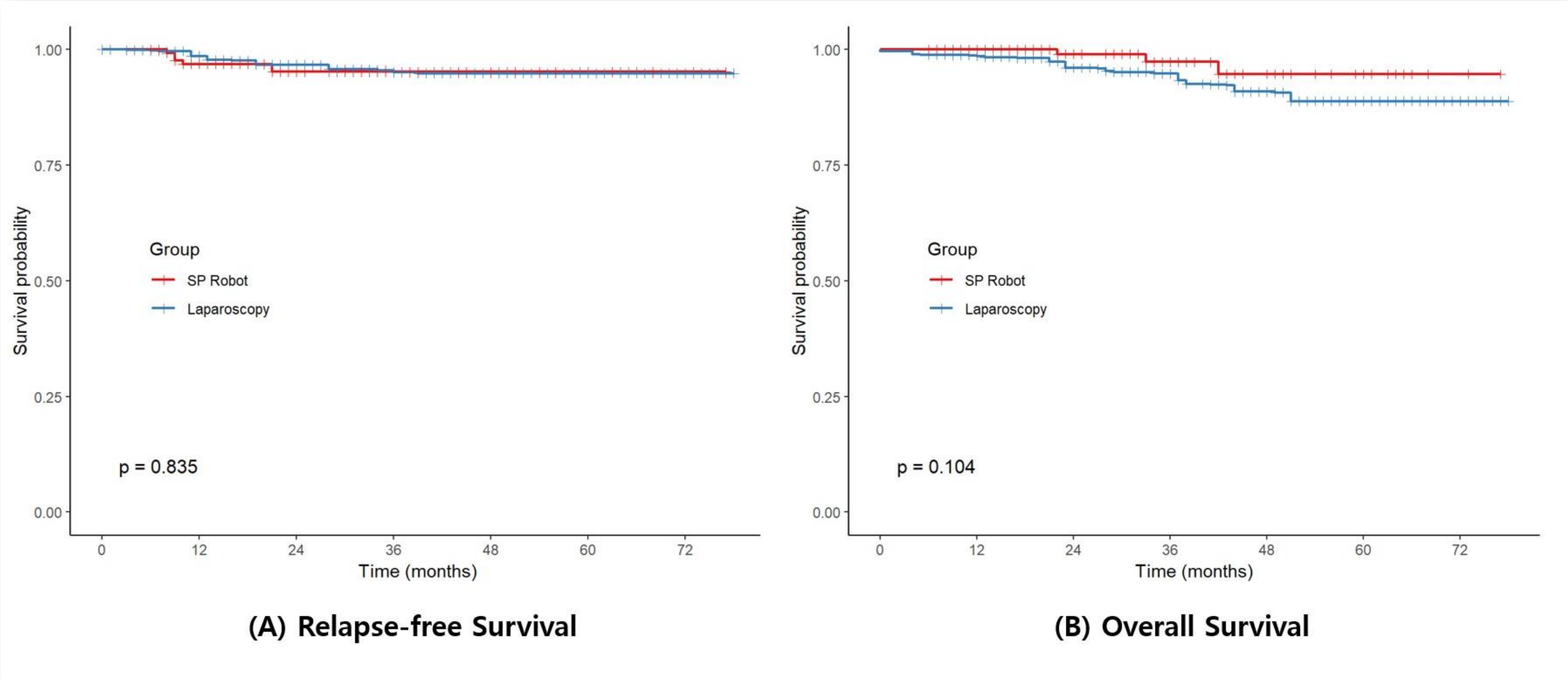


Figure 3. Survival analysis according to patient groups (SPRS vs CMLS)