A Comparative study on the short-term clinical outcomes of Da Vinci SP versus Da Vinci Xi for rectal cancer surgery

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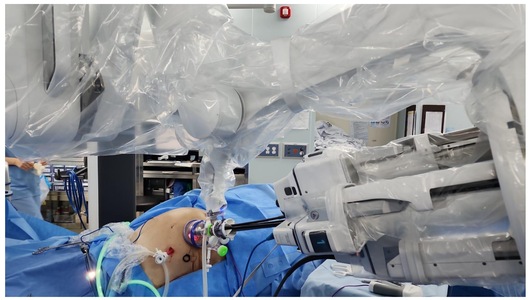
INTRODUCTION

The Da Vinci SP robot system was recently introduced, but its safety and feasibility for rectal cancer compared to the currently used Da Vinci Xi robot system have not been reported.

This study aimed to report the **safety and feasibility** *of the Da Vinci SP robot system for rectal cancer by comparing the short-term outcomes of the Da Vinci Xi robot system.*

SINGLE PORT Da Vinci Robot Cart





METHODS

- This was a single-center, retrospective study.
- Data from rectal cancer patients who underwent abdominal total mesorectal excision (TME) using the robotic Xi and SP systems from October 2015 to October 2022 were analyzed.
- After propensity score matching, the short-term clinical perioperative outcomes were compared between the Da Vinci SP and Xi robotic system groups.

RESULTS

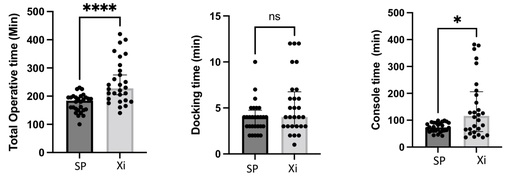
- A total of **56** patients who underwent robotic TME.
- Intersphincteric resection was **more common** in the SP group (7 cases (25%) *vs*. 0 case (0%), $p = 0.001$).
- The *operation time* was significantly **shorter** in **SP** (184 *vs*. 227.5 minutes, $p < 0.0001$), but the *docking time* was similar between the two groups.
- The *postoperative complications* were similar between the two groups (five cases in the SP group (17.9%) *vs*. four cases in Xi (14.3%), $p = 0.68$).
- There were **no differences** in the *postoperative pain score* and *length of hospital stay*.

Characteristics	SP n=28	Xi n=28	P-value
Sex (M:F)	15:13	15:13	NS
Age, median (ranges), years	66.5 (53.7-72.5)	64.0(56.0-70.3)	0.90
Body Mass Index (BMI, kg/m²), median (ranges)	22.5 (20.6-25.1)	22.5(21.2-24.8)	0.87
ASA classification			1.0
ASA I	10	10	
ASA II	18	18	
Operation type, n(%)			**0.001**
Intersphincteric resection with ileostomy	7 (25%)	0 (0%)	
Low Anterior resection (with/without ileostomy)	17 (60.7%)	25 (89.3%)	
Ultra-Low Anterior resection with ileostomy	4 (14.3%)	3 (10.7%)	
Tumor staging, n (%)			**0.001**
Stage I	11 (39.3%)	0 (0%)	
Stage II	11 (39.3%)	17 (60.7%)	
Stage III	6 (21.4%)	11 (39.3%)	

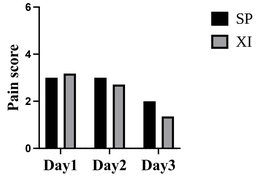
Basic characteristics

Variables	SP n=28	Xi n=28	p -value
Tumor size, cm, median (ranges)	2.6 (0.97-4.45)	5.9 (1.63- 11.63)	**0.003**
Tumor Differentiation, n (%)			0.1
Well Diff.	19 (67.9%)	22 (78.6%)	
Moderated Diff.	5 (17.9%)	4 (14.3%)	
Others	4 (14.3)	2 (7.1%)	
pT category, n(%)			0.7
T1/T2	14 (50%)	14 (50%)	
T3/T4a	14 (50%)	14 (50%)	
pN category, n(%)			
N0	21 (75%)	10 (35.7%)	
N1	5 (8.92%	15 (53.6%)	
N2	2 (3.57%)	3 (10/7%)	
Harvested lymph nodes, median (range)	17.00 (13.25-19.0)	18.5 (15.50-26.75)	*0.02*
Distal resection margin, median (range)	2.3 (0.5-5.2)	2.8 (1.6-3.7)	0.90
Proximal resection margin, median (range)	8.6 (5.6-10.9)	13.5 (10.0- 18.0)	**0.001**
Circumferential resection margin, n (%)			0.52
Positive	1 (3.57%)	2 (7.14%)	
Negative	27 (96.42%)	26 (92.86%)	

Pathologic outcomes between the SP and Xi group



- The total operative time is **significantly higher** in Xi than SP
- There is **no** significant difference of **docking time** between SP and Xi
- Console time is **higher** in Xi than SP



- There is **no** significant difference of **pain score** between SP and Xi

Variables	SP n= 28	XI n= 28	p -value
Total operative time, minutes, median, (range)	184.0 (150.8-195.0)	227.5 (186.3-305.0)	**<0.0001**
Docking time, minutes, median, (range)	4.0 (3.0-4.75)	4.0 (3.0-6.75)	0.15
Console time, minutes, median, (range)	73.0 (60.25-90.00)	116.0 (57.50-206.0)	0.02
Operative Blood loss (mL), median, (range)	20.0 (20.0-50.0)	30.0 (20.0-70.0)	0.16
Post-operative complication, n (%)			0.68
Total complication	5 (17.9%)	4 (14.3%)	
○ **Clavien-dindo class I**	3	1	
○ **Clavien-dindo class II**	2	2	
○ **Clavien-dindo class IIIa**	0	0	
○ **Clavien-dindo class IIIb**	0	1 (leak)	
Pain score (NRS), median			*0.05*
○ **Postoperative day 1**	3.0 (3.0-3.0)	3.0 (3.0-4.0)	
○ **Postoperative day 2**	3.0 (0.25-3.0)	3.0 (2.0-3.0)	
○ **Postoperative day 3**	2.0 (0-3.0)	2.0 (0-2.7)	
Length of stay (days), median, (range)	5.0 (4.0-6.0)	6.0 (5.0-8.0)	*0.01*

Perioperative outcomes

CONCLUSIONS

- The SP robotic system for abdominal TME has acceptable short-term outcomes compared with the Xi robotic system and **is safe and technically feasible.**

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