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DOES THE TRANSANAL APPROACH REDUCE SURGEON WORKING TIME COMPARED TO ROBOTIC SURGERY IN RECTAL CANCER RESECTION?

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Introduction

Low anterior resection for rectal cancer sometimes requires a long operation time and is associated with overtime.
Japanese work style reform for physicians, which became law in April 2024, regulates overtime limits (<960 hours/year), and there is an increasing need to reduce operating time.
This study aimed to determine whether robot-assisted low anterior resection (RALAR) or transanal total mesorectal excision (TaTME) is more useful in reducing surgeons' working time in next-generation minimally invasive surgery for rectal cancer.

Materials and methods

Single-center retrospective study

Patients : From May 2017 to October 2023
Low anterior resection for rectal cancer (AV≦15cm)
218 cases

Exclusion:
Conventional Laparoscopic surgery (n=64)
Combination of Robotic surgery and TaTME (n=28)

RALAR group (n=52)   TaTME group (n=73)

1:1 propensity score matching
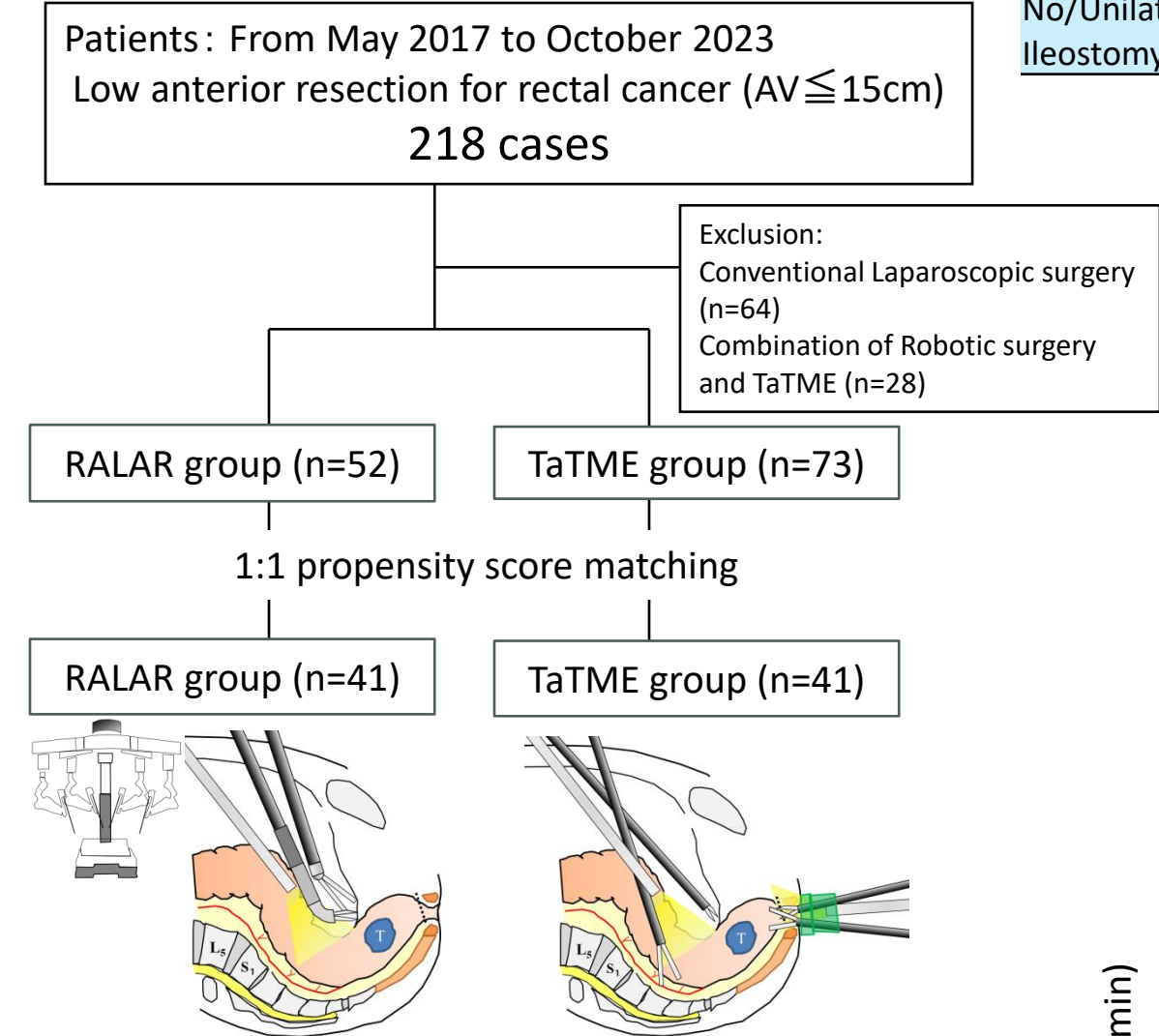
RALAR group (n=41)   TaTME group (n=41)

Figure 1. Patient flow chart, Parameters used in propensity score matching are: sex, body mass index (BMI)>25, anesthesia method, and extent of lateral lymph node dissection

Outcomes to be evaluated

· Operating room stay time
  (Time from patient entry to operating room to patient exit)
· Operative time
· Postoperative complication rate

Results

Table 1. Patient backgrounds after propensity score matching

	RALAR group(n=41)	TaTME group(n=41)	P
Age, median(range)	68(44-87)	68(29-85)	0.892
Sex, male/female (%)	26/15(63.4/36.6)	26/15(63.4/36.6)	1.000
ASA-PS 1/2/3 (%)	4/33/4(9.8/80.5/9.8)	5/32/4(12.2/78.0/9.8)	0.939
BMI, median (range)	23.5(17.0-35.3)	23.0(13.8-38.7)	0.826
Histology Adenocarcinoma/Others (%)	38/3(92.7/7.3)	33/8(80.5/19.5)	0.105
AV, cm, median(range)	10(5-15)	6(3-10)	<0.001
cT 0-1/2/3/4 (%)	8/15/9/9(19.5/36.6/22.0/22.0)	16/10/14/1(39.0/24.4/34.1/2.4)	0.011
cN 0/1/2 (%)	30/7/4(73.2/17.1/9.8)	32/6/3(78.0/14.6/7.3)	0.867
cM 0/1 (%)	39/2(95.1/4.9)	39/2(95.1/4.9)	1.000
Neoadjuvant therapy No/Chemotherapy /Chemoradiotherapy (%)	38/1/2(92.7/2.4/4.9)	25/5/11(61.0/12.2/26.8)	0.003
Anesthesia technique General/+Nerve blocking /+Epidural anesthesia (%)	7/18/16(17.1/43.9/39.0)	7/18/16(17.1/43.9/39.0)	1.000
Lateral lymph node dissection, No/Unilateral/Bilateral (%)	38/3/0(92.7/7.3/0)	38/3/0(92.7/7.3/0)	1.000
Ileostomy, No/Yes (%)	33/8(80.5/19.5)	1/40(2.4/97.6)	<0.001

Table 2. Operative and postoperative outcomes

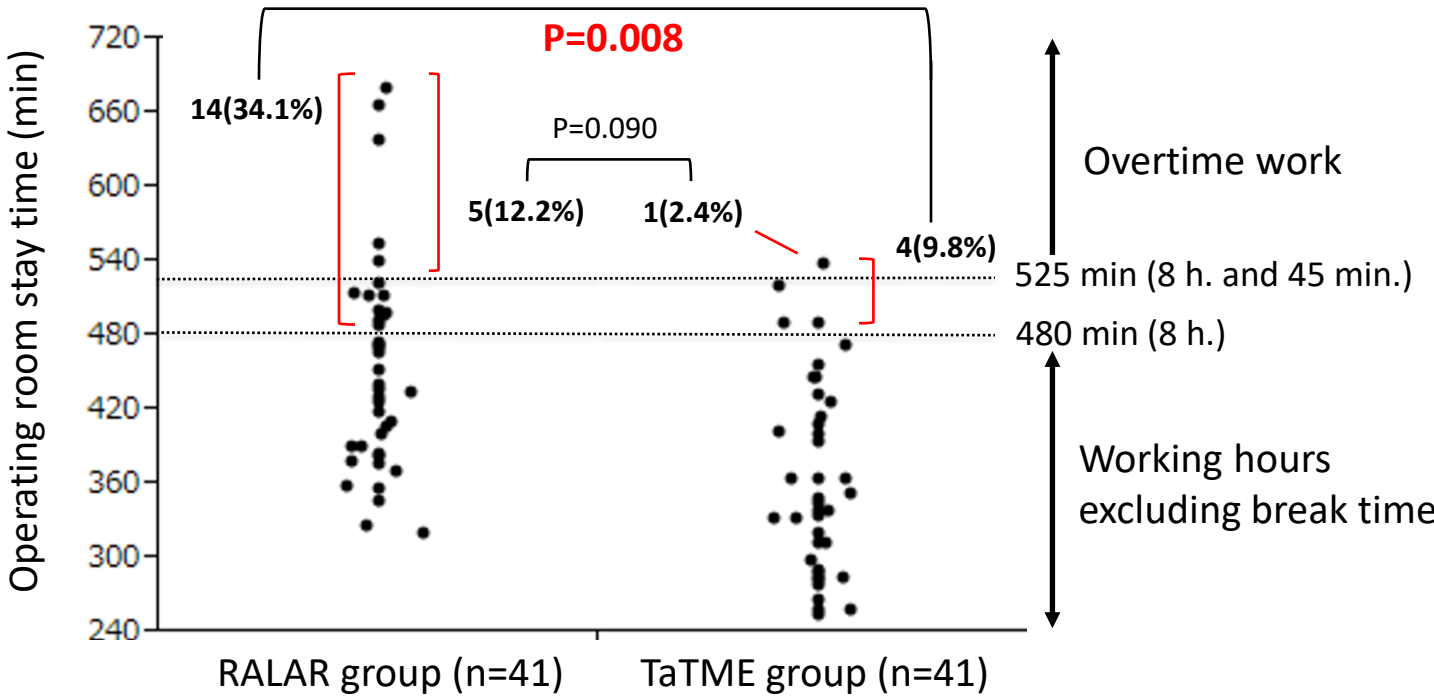|	RALAR group(n=41)	TaTME group(n=41)	P
Operative outcome			
(A)Operating room stay time, median, min(range)	437(321-680)	344(254-538)	<0.001
(B)Operative time, median, min(range)	356(222-584)	253(158-430)	0.001
(A)-(B) median, min(range)	94(66-121)	95(57-125)	0.822
Blood loss, median, g(range)	0(0-50)	0(0-175)	0.003
Postoperative complication(Clavien-dindo Grade≧2)			
Anastomotic leakage, n(%)	2(4.9)	1(2.4)	0.556
Intra-abdominal abscess, n(%)	3(7.3)	2(4.9)	0.644
Small bowel obstruction, n(%)	3(7.3)	7(17.1)	0.177
Urinary disfunction, n(%)	0(0)	1(2.4)	0.313
Reoperation, n(%)	2(4.9)	2(4.9)	1.000
Postoperative stay, median, day(range)	13(9-40)	18(8-47)	0.001

Figure 2. Operating room stay time

P=0.008
14(34.1%)
P=0.090
5(12.2%)   1(2.4%)   4(9.8%)
525 min (8 h. and 45 min.)
480 min (8 h.)
Overtime work
Working hours excluding break time
Operating room stay time (min)
RALAR group (n=41)   TaTME group (n=41)

Summary of results

· Patients' background factors were adjusted using propensity scores.
  The distance from the lower edge of tumor to the anal verge was shorter in the TaTME group, and the rate of neoadjuvant therapy and construction of ileostomy was higher in the TaTME group (Table 1).
· Operating room stay time and operative time were significantly shorter in the TaTME group.
  There was no significant difference in postoperative complications between the two groups.
  Postoperative hospital stay was significantly longer in the TaTME group (Table 2).
· The rate of operating room stay time exceeding 8 hours was significantly higher in the RALAR group (Figure 2).

Discussion/ Conclusion

· TaTME has a shorter operative time than robotic surgery, thereby reducing operating room stay time.
· Compared to robotic surgery, TaTME requires more surgeons during the procedure and a longer hospital stay for the patient to learn the stoma treatment.
· The limitation of this study is that both robotic surgery and TaTME may be affected by the learning curve effect. A comparison of surgical outcomes after both procedures have matured would yield more useful results.

In conclusion, TaTME is more useful than robot-assisted low anterior resection in reducing surgeons' work hours in rectal cancer resection.