

Table S3. Colorectal surgery

References	Country	Study design	Time period	Surgical indication	No. of pts/ procedures	Type of intervention	Robotic platform	No. of operative	Surgeons involved	Surgeon previous experience	Surgical Team training	Main results
<i>Case report/Technical notes</i>												
Samalavicius N.E. et al. (2019) [19]	Lithuania	Case report	2019	rectal adenoca	1	APR	Asensus Senhance®	2 (+1 AP)	1	NS	NS	Technical feasibility; OT: 180 min; blood loss: 50 ml; no IO complications
Samalavicius N.E. et al. (2019) [20]	Lithuania	Case report	2019	right colon adenoca	1	RC	Asensus Senhance®	2	1	NS	NS	Technical feasibility; OT: 180 min; blood loss: 50 ml; no IO complications.
Samalavicius N.E. et al. (2019) [21]	Lithuania	Case report	2019	sigmoid colon adenoca	1	sigmoidectomy	Asensus Senhance®	2 (+1 AP)	1	NS	NS	Technical feasibility; no PO complications.
Samalavicius N.E. et al. (2019) [22]	Lithuania	Case report	2019	rectal adenoca	1	hybrid taTME	Asensus Senhance®	NS	1	NS	NS	Technical feasibility; no PO complications; hospital discharge: POD7
Arezzo A. et al. (2020) [32]	Italy	Case report	2020	rectal LST	2	full thickness excision; ESD	Medrobotics Flex®	2	NS	NS	NS	Case 1: OT: 55 min; no IO complications; no PO complications; hospital discharge: POD 1. Case 2: NS.
Hirano Y. et al. (2020) [18]	Japan	Case report	2020	sigmoid colon adenoca	1	LC	Asensus Senhance®	2 (+1 AP)	1	NS	NS	OT: 204 min; blood loss: 75 mL; no IO complications; no PO complications; hospital discharge: POD 8
Kataoka A. et al. (2020) [25]	Japan	Case report	2020	right colon adenoca	1	RC	Asensus Senhance®	2/3 (dual docking)	1	NS	NS	OT: 313 min; DT: 18 min; blood loss: 5 ml; no IO complications; no PO complications; hospital discharge: POD 12
Kondo H. et al. (2020) [26]	Japan	Case report	2020	cecal adenoca	1	ileocecal resection	Asensus Senhance®	2 (+2 AP)	1	First robotic surgery experience	Dry lab	OT: 198 min; DT: 30-40 min; blood loss: 10 ml; no IO complications; No PO complications; hospital discharge: POD 9
Marks J.H. et al. (2020) [33]	US	Case report	2020	cecal adenoca	1	RC	Intuitive Surgical Da Vinci SP®	3 (+2 AP)	1	Extensive robotic experience	NS	Technical feasibility; OT: 219 min; DT: 19 min; blood loss: 100 ml; no IO complications; hospital discharge: POD 3

Marks J.H. et al. (2020) [31]	US	Case report	Oct 2018	diverticular disease	2	LC	Intuitive Surgical Da Vinci SP®	3 (+1 AP)	1	Cadaveric experience with the robot	NS	OT: 305 min; CT: 209 min; DT: 13; blood loss: 40 ml; no IO complications; no PO complications; LOS: 2.5 days †
Samalavicius N.E. et al. (2020) [21]	Lithuania	Technical note	2019	rectal adenoca	1	TME	Asensus Senhance®	2 (+1 AP)	1	NS	NS	Technical feasibility; hospital discharge: POD 6
Marks J.H. et al. (2021) [34]	US	Case report	17 mos	rectal adedoma	2	full thickness excision	Intuitive Surgical Da Vinci SP®	3 (+1 AP)	1	NS	NS	OT: 180.5 min; CT: 122.5; blood loss: 15 ml; no IO complications; LOS: 1 day †
Marks J.H. et al. (2021) [36]	US	Case report	2 mos	rectal adedoma	2	taTME (only transanal time); fully taTME	Intuitive Surgical Da Vinci SP®	3 for the transana 1 time	1	NS	NS	CT: 214.5 min; DT: 13.5 min; blood loss: 165 ml; no IO complications; no PO complications; hospital discharge: POD 2.5; 22.4 mos follow-up: no recurrence †
Marks J. et al. (2021) [35]	US	Technical note	NS	rectal adenoca	1	taTME	Intuitive Surgical Da Vinci SP®	3 (+1 AP)	1	NS	NS	no IO complications; no conversion; blood loss: 50 ml; hospital discharge: POD 4; negative margins
Minagawa Y. et al. (2021) [16]	Japan	Case report	2021	transverse colon adenoca	1	single incision + 1 port transverse colectomy	Asensus Senhance®	2 (+1 AP)	1	NS	NS	OT: 203 min; DT: 11 min; blood loss: 35 ml; PO anastomotic bleeding (Clavien-Dindo 3a); hospital discharge: POD 8.
Samalavicius N.E. et al. (2021) [23]	Lithuania	Technical note	2021	rectal NET	1	APR	Asensus Senhance®	2 (+1 AP)	1	NS	NS	Technical feasibility; no PO complications; hospital discharge: POD7
Alshalawi W. et al. (2022) [14]	South Korea	Technical note	2022	rectal adenoca	1	TME with ISR	Intuitive Surgical Da Vinci SP®	3 (+1 AP)	1	NS	NS	OT: 185 min; estimated blood loss: 30 ml; hospital discharge: POD 6
Bak M. R. et al. (2022) [15]	South Korea	Technical note	2022	rectal prolapse	1	ventral rectopexy	Intuitive Surgical Da Vinci SP®	3	1	NS	NS	Technical feasibility. No IO complications. No PO complications.
Cheong J.Y. Et al. (2022) [30]	South Korea	Technical note	2022	rectal adenoca	1	TME with ISR	Intuitive Surgical Da Vinci SP®	3 (+1 AP)	1	NS	NS	DT: 7 min; CT: 180 min; no IO complications; blood loss: <50 ml; hospital discharge: POD 6
Choo J.M. et al. (2022) [29]	South Korea	Technical note	2022	right colon adenoca	1	RC	Intuitive Surgical Da Vinci SP®	3 (+1 AP)	1	NS	NS	DT: 4 min; CT: 134 min; no IO complications; hospital discharge: POD 4
Piozzi G.N. et al. (2022) [28]	South Korea	Case report	2022	transverse colon adenoca	1	transverse colectomy	Intuitive Surgical Da Vinci SP®	3 (+1 AP)	1	NS	NS	OT: 225 min; DT: 6 min; blood loss <50 ml; no IO complications; no PO complications; hospital discharge: POD 6; 17 mos follow-up: no recurrence

Campagna et al. (2023) [27]	Italy	Case report	2023	multicompar tmental prolapse	1	sacrocolpopexy and ventral rectopexy	Medtronic Hugo™ RAS	2 (+1 AP)	1	NS	NS	Technical feasibility; OT: 120 min; DT: 8 min; no IO complications; no PO complications; hospital discharge: POD 2
Samalavicius N.E. et al. (2023) [24]	Lithuania	Technical note	2022	sigmoid colon adenoca	1	sigmoidectomy	Asensus Senhance®	2	1	NS	NS	Technical feasibility; no PO complications; hospital discharge: POD7
<i>Non-comparative studies</i>												
Spinelli A. et al. (2017) [64]	Italy	Retrospective analysis of a prospectively collected database	16 mos (Jun 2015- Nov 2016)	28 adenoca; 8 IBD; 5 diverticular disease; 2 NET; 2 adenoma	45	23 RC; 12 AR; 9 LC; 1 total colectomy	Asensus Senhance®	2/3 (+1/2 AP)	1	Extensive laparoscopic colorectal experience	The surgeon and the nurses received platform training	OT: 256 min; DT: 10.7; conversion to laparoscopy: 6.7%; blood loss: <50 ml; oncological R0 resection: 100%; Clavien-Dindo≥3: 4.4%; LOS: 5 days; hospital readmission: 2.2%
Collins D. et al. (2020) [56]	UK	Retrospective analysis of a prospectively collected database	5 mos (Oct 2019 - Mar 2020)	adenoca	32	18 RC; 14 AR	CMR Versius®	RC: 2 (+1 AP); TME: 3 (+1 AP)	3	Extensive laparoscopic colorectal experience. One surgeon had a robotic fellowship	6h simulation; 32h dry lab and cadaver lab. 14h45 console. Proctoring for the first cases.	RC: OT: 221 min; CT: 111 min. AR: OT: 319 min; CT: 204 min. Blood loss: 150 ml; laparoscopic CR: 12.5%; open CR: 6.2%; no Clavien-Dindo≥3 PO complications; LOS: 5.3 days †
Darwich I. et al. (2020) [65]	Germany	Retrospective analysis	12 mos (Oct 2017- Oct 2018)	12 diverticular diseases	12	12 sigmoidectomies	Asensus Senhance®	2 (+1 AP)	2	NS	NS	OT: 219 min; CT: 149 min; DT: 10 min; blood loss: 20 ml; Clavien-Dindo≥3: 8.3%; LOS: 9 days †
Li J. et al. (2020) [69]	China	Retrospective analysis of a prospectively collected database	10 mos (Mar 2018- Dec 2018)	adenoca	25	25 RC with CME	Wego MicroHand S	2 (+1 AP)	1	Laparoscopic CME since 2015, Da Vinci robotic CME since 2017, Micro Hand S CME since 2018	NS	OT: 210 min; DT: 10 min; blood loss: 55 ml; no conversion; no Clavien-Dindo≥3; LOS: 7 days; no recurrence at 12-mos follow-up

Lin C.-C. et al. (2020) [59]	Taiwan	Retrospective analysis of a prospectively collected database	7 mos (Jun 2019-Dec 2019)	39 adenoca; 2 diverticular disease; 3 adenoma; 2 rectal prolapse	46	24 AR; 11 RC; 3 APR; 2 sigmoidectomy with rectopexy; 2 LC; 2 LAR; 1 SC; 1 TaTME	Asensus Senhance®	2 (+1 AP)	4	First experience with the Senhance® platform	Senhance® robotic system training courses	DT: 25 min; CT: 112 min; OT: 283 min; blood loss: 50 ml; Clavien-Dindo≥3: 6.5%; mortality: 2.1%; LOS: 8 days †
Noh G.T. et al. (2020) [61]	South Korea	Retrospective analysis	5 mos	5 adenoca; 2 diverticular disease	7	5 RC; 2 AR	Intuitive Surgical Da Vinci SP®	3 (+2 AP)	1	NS	NS	OT: 300 min; DT: 20 min; CT: 225 min; blood loss: 50 ml; no IO complications; LOS: 7 days.
Salem J.F. et al. (2020) [62]	US	Retrospective analysis	NS	4 diverticular disease	4	4 LC	Intuitive Surgical Da Vinci SP®	3 (+2 AP)	1	Involved in robotic development	NS	OT: 310 min; DT: 8.4 min; blood loss: 91 ml; no IO complications; LOS: 2.7 days †
Dixon F. et al. (2021) [57]	UK	Retrospective analysis of a prospectively collected database	5 mos	16 adenoca; 1 diverticular disease; 1 IBD; 5 benign (not specified)	23	9 RC; 6 ARs; 4 APR; 1 LC; 1 Hartmann; 1 completion proctectomy; 1 proctocolectomy	CMR Versius®	NS	2	First experience in robotic surgery	NS	CT: 166 min; DT: 17 min; blood loss 100 ml; no IO complications; conversion to open: 4.3%; Clavien-Dindo≥3 PO complications: 8.7%; LOS: 5 days
Hirano Y. et al. (2021) [66]	Japan	Retrospective analysis of a prospectively collected database	4 mos (Dec 2019-Mar 2020)	adenoca	8	4 RC; 1 sigmoidectomy; 3 AR	Asensus Senhance®	2 (+1 AP)	NS	NS	NS	OT: 229.1 min; CT: 139.1 min; blood loss: 49.4 ml; conversion to laparoscopy: 12.5% due to scope holder damage; no PO complications; LOS: 7.1 days
Kim. H.J. et al. (2021) [68]	South Korea	Retrospective analysis	4 mos (Jul-Sep 2020)	rectal adenoca	5	4 AR; 1 AR + ISR	Intuitive Surgical Da Vinci SP®	3 (+2/3 AP)	1	NS	NS	OT: 195; CT: 130 min; DT: 4 min 20 sec; no open/laparoscopic conversion; blood loss: 15 ml; Clavien-Dindo≥3: 20%; LOS: 7 days
Marks J. et al. (2021) [75]	US	Prospective trial	18 mos (Oct 2018 - Mar 2020)	14 rectal adenomas; 10 rectal adenocas; 1 rectal GIST; 1 rectal carcinoid	26	22 full thickness excision; 4 ESDs	Intuitive Surgical Da Vinci SP®	3 (+1 AP)	1	NS	NS	OT: 124.2 min; DT: 6.4 min; R0 resection: Clavien-Dindo≥3: 3.8%; R0 resection rate: 100%; no recurrence at 5.9 mos follow-up †

Song S.H. et al. (2021) [73]	South Korea	Retrospective analysis	4 mos (2020)	right colon adenoca	5	5 RC	Intuitive Surgical Da Vinci SP®	3 (+4 AP)	1	NS	NS	OT: 160 min; CT: 105 min; DT: 4 min 40 sec; blood loss: 20 ml; no IO complications; no conversion to open/laparoscopy; no Clavien-Dindo≥3; LOS: 7 days; no 30-days mortality
Fok K.Y. et al. (2022) [58]	Australia	Retrospective analysis	NS	4 adenoma; 1 hyperplastic polyp	5	4 ESD; 1 full thickness excision	Medrobotics Flex®	2	1	9 y of experience with the TEM	2-day cadaveric course training	OT: 143 min; no IO complications; no PO complications; LOS: 0.6 days †
Huscher C. et al. (2022) [67]	Italy	Retrospective analysis of a prospectively collected database	7 mos (Jul 2020-Dec 2020)	6 adenocas	6	3 RC; 2 sigmoidectomies ; 1 AR	CMR Versius®	3 (+1 AP)	2	>1500 surgeries with multiple robots	The surgeons completed the CMR surgical-validated training (virtual simulation, cadaveric training). CMR team proctoring.	For RC: OT: 160 min. For sigmoidectomies: 246 min. For AR: 250 min. No IO complications; blood loss: 1 patient 100-500 ml; no Clavien-Dindo≥3 complications; LOS: 6.5 days
Liu S. et al. (2022) [74]	US	Retrospective analysis	NS	4 rectal adenomas; 1 rectal adenoca	5	full thickness excision	Intuitive Surgical Da Vinci SP®	3 (+1 AP)	NS	NS	NS	no IO complications; 1 readmission
Morino M. et al. (2022) [60]	Italy	Retrospective analysis of a prospectively collected database	16 mos (Oct 2018 - Feb 2020)	22 adenoma; 4 adenoca	26	14 full thickness excision; 12 ESD	Medrobotics Flex®	2	NS	NS	2-day training (dry lab, wet lab, cadavers), completing a full procedure (dissection and suturing)	OT: 115 min; 6 conversions to TEO; 1 unintentional IO perforation; R1 resection: 15%; 30-days Clavien-Dindo≥3: 3.8%; LOS: 3 days; 12 mos follow-up: 11.5% recurrence
Piozzi G.N. et al. (2022) [70]	South Korea	Retrospective analysis of a prospectively collected database	13 mos (Nov 2020-Dec 2021)	6 adenocas; 1 squamous cell carcinoma	13	7 ISR; 5 RC; 1 transverse colectomy	Intuitive Surgical Da Vinci SP®	3 (+2 AP)	1	NS	NS	For ISR: OT: 280 min; DT: 7 min; CT: 157 min. For right/transverse colectomies: OT: 220 min; DT: 5 min; CT: 155 min. Blood loss: <50 ml; no IO complications; no conversion; Clavien-Dindo≥3: 14.3%; LOS: 7 days; 2 systemic recurrence at 8 mos follow-up
Puntambekar S.P. et al. (2022) [71]	India	Retrospective analysis of a prospectively	8 mos (Aug 2019-	adenoca	31	31 ARs with TME	CMR Versius®	2 (+3 AP)	NS	NS	NS	CT: 51 min; DT: 17 min; no conversion; blood loss: 55 ml; no Clavien-Dindo≥3 †

		collected database	Mar 2020)									
Samalavicius N.E. et al. (2022) [72]	Lithuania	Retrospective analysis of a prospectively collected database	24 mos (Nov 2018- Nov 2020)	48 adenoca; 9 adenoma; 1 FAP; 1 diverticular disease	57	16 RC; 11 ARs with PME; 10 sigmoidectomies ; 9 ARs with TME; 5 APR; 4 taTME; 1 SC; 1 AR with PME and Hartmann	Asensus Senhance®	2 (+1 AP)	NS	NS	NS	OT: 194 min; blood loss: 20 ml; conversion to open: 3.4%; Clavien-Dindo≥3: 7%; LOS: 8 days †
Sasaki M. et al. (2022) [63]	Japan	Retrospective analysis	36 mos (May 2018- May 2021)	adenoca	55	18 ileocecal resection; 8 RC; 1 transverse colectomy; 9 sigmoid colectomy; 18 AR; 1 ISR	Asensus Senhance®	2 (+1/2 AP)	NS	NS	NS	OT: 240 min; DT: 8 min; CT: 126 min; blood loss: 5 ml; no IO complications; LOS: 7 days
<i>Comparative studies - platforms</i>												
Luo D. et al. (2020) [107]	China	Retrospective comparative study	24 mos (Jan 2017- Jan 2019)	sigmoid adenoca	45 (21 MicroHand S; 24 Da Vinci)	45 sigmoidectomies	Wego MicroHand S; Intuitive Surgical Da Vinci (NS)	NS	NS	NS	NS	MicroHand S: OT: NS; conversion to open: 4.8%; blood loss: 118.6 ml; LOS: 9.1 days. Da Vinci: OT: 241.7 min; conversion to open: 8.3%; blood loss: 256.7 ml; LOS: 9.8 days †
Zeng Y. et al. (2020) [111]	China	Retrospective comparative study	14 mos (Jan 2018 - Feb 2019)	right colon adenoca	22 (10 MicroHand S; 12 laparoscopic)	22 RC	Wego MicroHand S	2 (+2 AP)	NS	NS	NS	For the MicroHand S: lower CCI: 11.7 (p<0.05); shorter hospital discharge: 11.4 days (p<0.05) †
Jiang J. et al. (2021) [104]	China	Prospective comparative study	19 mos (May 2017- Dec 2018)	rectal adenoca	90 (47 Da Vinci Si; 43 MicroHand S)	For the MicroHand S: 42 AR with TME; 1 APR	Wego MicroHand S; Intuitive Surgical Da Vinci Si	2 (+1 AP)	1	Laparoscopic TME since 2015, Da Vinci robotic TME since 2016 and Micro Hand S robotic TME since 2017	NS	For the MicroHand S: OT: 250 min; DT: 23 min; CR: 2.3%; blood loss: 57 ml; Clavien-Dindo≥3: 9.3%; LOS: 7 days; no difference in any outcomes between Da Vinci Si and MicroHand S; no difference in F outcomes

Lei Y. et al. (2021) [105]	China	Prospective comparative study	28 mos (Jan 2017-May 2019)	rectal adenoca	134 (46 laparoscopic; 45 Da Vinci Si; 43 MicroHand S)	For the MicroHand S: 42 AR with TME; 1 APR	Wego MicroHand S; Intuitive Surgical Da Vinci Si	Wego MicroHand S: 2 (+1 AP); Intuitive Surgical Da Vinci Si: 3 (+1 AP)	1	Performed 200 laparoscopic TME, 30 robotic TME using Da Vinci Si and 55 TME using MicroHand S	NS	For the MicroHand S: OT: 235 min; docking: 20.1 min (significantly longer compared to Da Vinci); CR: 2.3%; Clavien-Dindo \geq 3: 9.3%; LOS: 7.4 days; F recovery was faster in the robotic surgery group but recovered to preoperative level in all the three groups at 12 mos †
Wang Y. et al. (2021) [109]	China	Retrospective comparative study	40 mos (Jul 2015-Nov 2018)	rectal adenoca	105 (65 laparoscopic; 40 MicroHand S)	For the MicroHand S: 38 AR with TME; 2 APR	Wego MicroHand S	2 (+2 AP)	1	Performed 300 open and >100 laparoscopic colorectal surgeries. Assisted >50 laparoscopic cases.	Training with MicroHand S	For the MicroHand S: OT: 339.3 min; blood loss: 140.9 ml; conversion to open: 2.5%; Clavien-Dindo \geq 3: 7.5%; LOS: 9.2 days; no F difference between robotic and laparoscopic TME; LC: after 17 cases significative reduction in OT †
Zeng Y. et al. (2021) [110]	China	Retrospective comparative study with PSM	58 mos (Jan 2016-Oct 2020)	rectal adenoca	54 (39 Da Vinci; 15 MicroHand S) - 28 considered for the PSM	54 AR with TME	Wego MicroHand S; Intuitive Surgical Da Vinci Si	2 (+2 AP)	2	>15 y laparoscopic surgery and >5 y with Da Vinci robot. Involved in the MicroHand development and >100 surgeries.	NS	For the MicroHand S: OT: 260.6 min; CT: 143.3 min; DT: 24.2 min (vs 17.1 min of Da Vinci, p=0.021 at PSM); LOS: 13.2 days; total hospital costs 87,040.1 yuan (vs 125,292.3 of the Da Vinci, p<0.05 at PSM); surgery costs: 25,772.3 yuan (vs 46,940.9 yuan of the Da Vinci, p<0.05 at PSM) †
Liu Y. et al. (2022) [106]	China	Prospective comparative study	36 mos (Jan 2017-Jan 2020)	rectal adenoca	135 (45 laparoscopic; 47 Da Vinci Si; 43 MicroHand S)	For the MicroHand S: 42 AR with TME; 1 APR	Wego MicroHand S; Intuitive Surgical Da Vinci Si	NS	1	200 laparoscopic TME; 30 Da Vinci robotic TME; 35 TME using MicroHand S	NS	For the MicroHand S: OT: 235 min; blood loss: 66.6 ml; CR: 2.3%; Clavien-Dindo \geq 3: 7%; F recovery was faster in the robotic surgery group but recovered to preoperative level in all the three groups at 12 mos. No F difference between the robotic platforms †

Wang Y. et al. (2022) [108]	China	Retrospective comparative study	12 mos (May 2017-Apr 2018)	rectal adenoca	99 (29 open; 44 laparoscopic; 26 MicroHand S)	For the MicroHand S: 25 AR with TME; 1 APR	Wego MicroHand S	2 (+1 AP)	1	5 y open surgery; 2 y laparoscopic surgery; simple robotic procedures; first experience with robotic TME	NS	For the MicroHand S: OT: 295.4 min; conversion to open: 3.8%; blood loss: 99.2 ml; Clavien-Dindo \geq 3: 7.7%; LOS: 8.9 days; surgical success: 84.6%; no F difference between robotic, open and laparoscopic TME; LC: after 13 cases significant reduction in OT †
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All the reported values are absolute or median if not specified. † mean; NS: not specified; IO: intraoperative; PO: postoperative; LC: learning curve; OT: operative time; CT: console time; DT: docking time; CR: conversion rate; LOS: length of stay; AP: assistant port; NET: neuroendocrine tumor; Adenoca: adenocarcinoma; RC: right colectomy; AR: anterior resection; LC: left colectomy; APR: abdominoperineal resection; SC: subtotal colectomy; ISR: intersphincteric resection; ST: short-term; LT long-term; F: functional; CA: cost analysis