The feasibility and safety of intracorporeal anastomosis in the single-incision laparoscopic colectomy
-initial experience of ICA in SILC-

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Abstract

[Background] Although intracorporeal anastomosis (ICA) is potentially beneficial to reduce mesenteric traction and the risk of twisting of mesenterium during anastomosis and to minimize the necessity of mobilization of colon as compared to extracorporeal anastomosis (ECA), the feasibility and safety in single-incision laparoscopic colectomy (SILC) is still unclear. This study aimed to clarify the feasibility and safety of ICA in SILC with preoperative chemical and mechanical preparation.

[Methods] The study population included sixty consecutive patients (ICA, n= 22; ECA, n= 38) who underwent elective SILC between July 2019 and August 2021.

[Results] No significant between-group difference was found in patient characteristics. Although no significantly difference was found in operation time (median 298 [IQR 246-369] vs 286 [231-346] min, respectively, P= 0.425)), anastomotic time was significantly longer in ICA (61 [51-69] vs 28 [26- 32] min, P< 0.001). The estimated blood loss was smaller in ICA (10 [9-30] vs 35 [10-83] g, P= 0.028) and final skin incision was shorter in ICA (30 [30-30] vs 30[30-50] cm, P= 0.011). No anastomotic leakage has been found in ICA group so far. Furthre, no significant between-group difference was found in the rate of organ surgical site infection (SSI) (4.6 vs 7.9%, P= 1.000), the first postoperative flatus (2 [1-2] vs 2 [1-2] days, P= 0.798), the first postoperative fecus (3 [2-4] vs 3 [2-4], P= 0.425), and length of stay after surgery (8 [7-9] vs 9 [8-11], P= 0.214).

[Conclusion] Operation time in SILC was not significantly different between ICA and ECA, although anastomotic time of ICA was significantly longer than ECA. ICA was beneficial to reduce blood loss and skin incision length. The feasibility and safety of ICA in SILC was acceptable.



- 10mm flexible scope
- 10mm LFT guide sheath
- Lap protector® FF1010, EZ Access®
- EZ trocar® 5mm (95mm)
- EZ link®,
- LCS
- Signia stapling system®, Endo GIA® purple 60

Fig. 1 Devices used in ICA. *ICA* intracorporeal anastomosis

- Surgical technique

-Techinique-

- Place and tie stay sutures at the resection margin
- Hold the strings of stay sutures through 4th hole (①)
- Make enterotomy at the resection margin contralateral to the mesentery
- Place and tie stay sutures at the enterotomy holes(②)
- Insert stapler and form side-to-side anastomosis
- Close common stab incision temporarily with continuous suture
- Resect the common stab incision with stapler
- Add serosoral muscular suture at the crotch and cross point of staplers

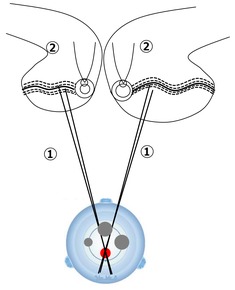


Fig. 2 Surgical technique of ICA in SILC.
ICA intracorporeal anastomosis *SILC* single-incision laparoscopic colectomy

Table. 1 Clinical characteristics of the patients

	ICA (n=22)	ECA (n=38)	p value
Age (years)	75 (68–80)	72.5 (65.5-80)	0.651
Sex			0.595
Female	13 (59.1)	19 (50.0)	
Male	9 (40.9)	19 (50.0)	
BMI (kg/m^2)	22.0 (19.9–24.4)	21.4 (19.5–25.0)	0.890
ASA-PS			0.518
1	4 (18.2)	4 (10.5)	
2	12 (50.0)	25 (65.8)	
3	7 (31.8)	8 (21.1)	
4	0 (0.0)	1 (2.6)	
Location[a]			0.137
Right	14 (63.6)	31 (81.6)	
Left	8 (36.4)	7 (18.4)	
Pathological Stage			0.669
pStage 0	3 (13.6)	2 (5.3)	
pStage I	6 (27.3)	7 (18.4)	
pStage II	4 (18.2)	8 (21.1)	
pStage III	6 (27.3)	15 (39.5)	
pStage IV	3 (13.6)	6 (15.8)	
Tumor size (cm)	37.5 (13.3–60)	30 (15–60)	0.902

Data are shown as *n* (%) or median (interquartile range).
ECA extracorporeal anastomosis, *ICA* intracorporeal anastomosis, *BMI* body mass index, *ASA-PS* American Society of Anesthesiologists physical status
[a]Right indicates cecum to mid-transverse colon, and left indicates splenic flexure to descending colon.

Table. 2 Operative factors and complications

	ICA (n=22)	ECA (n=38)	p value
Operating time (minute)	246 (298–369)	231 (286–346)	0.425
Anastomosis time (minute)	61 (51-69)	28 (26-32)	<0.001
Blood loss (mL)	10 (9–30)	35 (10–83)	0.028
Final skin incision (mm)	30 (30-30)	30 (30-50)	0.011
Postoperative length of stay (days)	7 (8-9.3)	8 (9-10.8)	0.214
Postoperative flatus (days)	2 (1-2)	2 (1-2)	0.798
Postoperative feces (days)	3 (2-4)	3 (2-4)	0.425
Postoperative complications			
Any	4 (18.2)	15 (39.5)	0.149
Leakage[a]	0 (0.0)	1 (2.6)	1.000
Superficial SSI[a]	0 (0.0)	1 (2.6)	1.000
Visceral SSI[a]	1 (4.6)	2 (5.3)	1.000
Ileus[a]	2 (9.1)	4 (10.5)	1.000

Data are shown as *n* (%) or median (interquartile range).
ICA intracorporeal anastomosis, *ECA* extracorporeal anastomosis, *SSI* surgical site infection.
[a]This compliation occurred with one or more complication in some patients.