



Impact of Preoperative Subcutaneous Fat on Totally Extraperitoneal Repair

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Background

- First choice of adult inguinal hernia is **TEP** or **Lichtenstein repair** according to the European Hernia Guidelines.
- However, the penetration rate of TEP¹⁾ (8.2%) is **way lower** than TAPP (37.7%) due to the long and steep learning curve²⁾ (**50-100cases**).

1)14th Nationwide Survey of Endoscopic Surgery in Japan, *Journal of JSES*, 2018

2) Simons MP et al, *Hernia*, 2009

Preoperative subcutaneous adipose tissue (preSAT)

- Correlation between **operative time**, **postoperative hospital stay** in laparoscopic colon surgery.

Cecchini et al., *World J Surg*, 2011
- Correlation between **bleeding** in laparoscopy-assisted distal gastrectomy.

Makino et al., *J Surg Oncol*, 2010
- Difficulty of the **first port insertion** in laparoscopic gynecologic surgery.

Nishimura et al., *J Obstet Gynaecol Res*, 2019

However

Unknown between the correlation of **preSAT** and **endoscopic hernia repairs**.

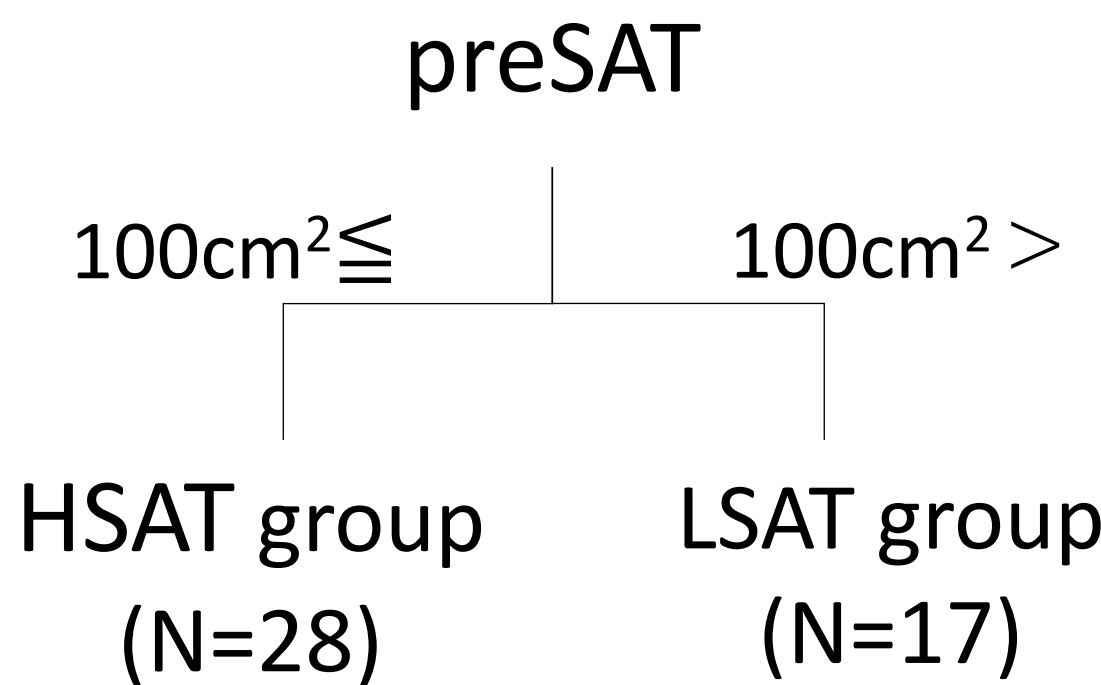
Aims

- Evaluate the effect of **preSAT** in terms of surgical outcomes and perioperative complications.
- Clarify the factors causing TEP repair difficult.

Patients

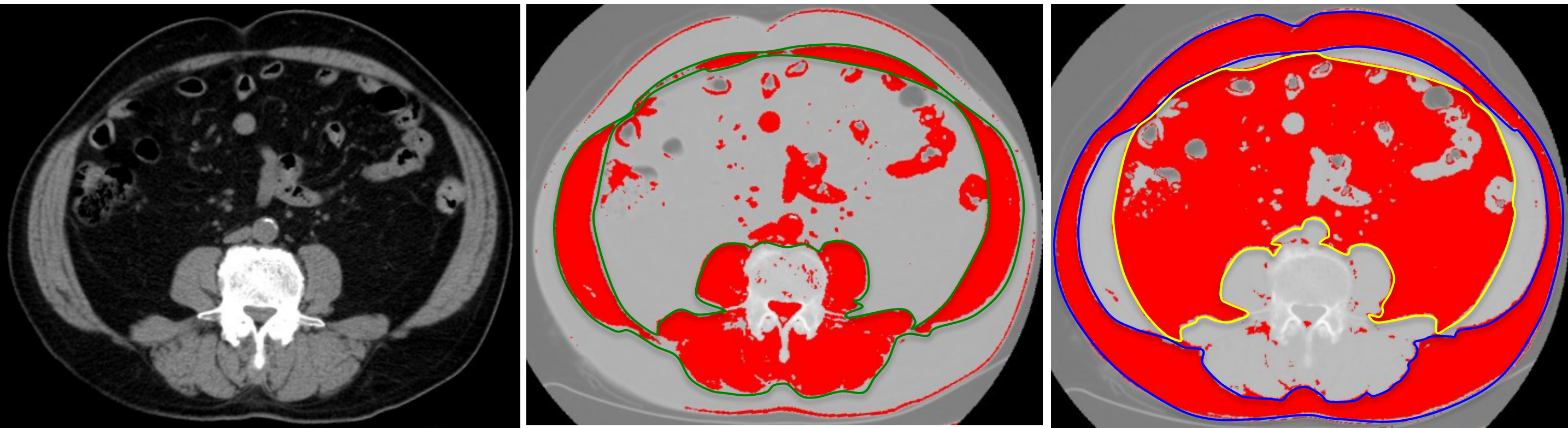
N=45

- Unilateral adult TEP repairs
- June, 2017～June, 2019



Methods

- DICOM images imported from 64–/16– row multidetector CT scanner (GE Healthcare Ltd, Hino, Japan).
- ImageJ (Ver.1.52i) software** (NIH: National Institute of Health, USA) was used to measure the CT values of the region of interest (ROI).



L3 level (cross-sectional)

CT value : -29 ～ 150 HU

CT value : -190 ～ -30 HU

Patient Characteristics

	HSAT (n=28)	LSAT (n=17)	<i>P</i> value
Age, years (mean±SD)	67.0±2.7	66.9±3.3	0.753
Gender			
Male	23 (82.1)	16 (94.1)	0.227
Female	5 (17.9)	1 (5.9)	<0.002
Body weight (kg)	64.0±1.8	56.7±2.2	0.011
Height (cm)	164.1±7.5	162.8±9.0	0.464
BMI (kg/m ²)	23.7±2.3	21.2±2.7	0.002
SFA (cm ²)	153.6±5.0	74.3±6.2	<0.0001
VFA (cm ²)	140.5±59.0	76.6±34.4	0.0002
SMM (cm ²)	137.6±20.2	134.2±33.2	0.661
Location of hernia			0.546
Right	13 (46.4)	10 (58.8)	
Left	15 (53.6)	7 (41.2)	
Type of hernia*			0.657
I	17 (60.7)	12 (70.6)	
II	5 (17.9)	4 (23.5)	
III	6 (21.4)	1 (5.9)	
IV	0 (0.0)	0 (0.0)	

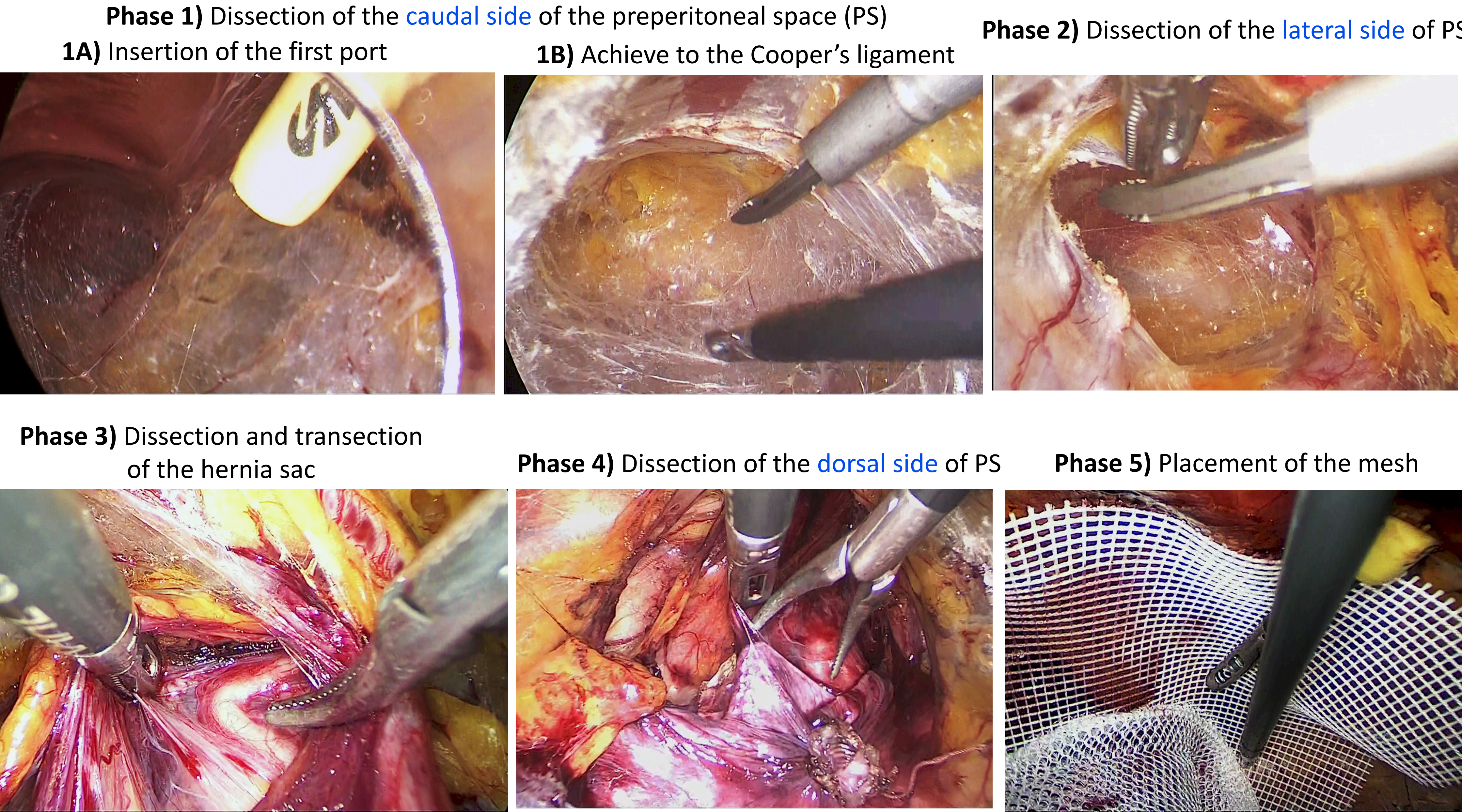
Values in parentheses are percentages
SFA: Subcutaneous fat area, VFA: Visceral fat area, SMM: Skeletal muscle mass
*Nyhus classification

Surgical Outcomes

	HSAT (n=28)	LSAT (n=17)	<i>P</i> value
Operative time, min (median)	132 (73–255)	111 (63–167)	0.117
Blood loss, mL	2.5±1.5	2.6±1.7	0.743
Intraoperative complications			
Conversion to TAPP	3 (10.7)	0 (0.0)	0.151
Peritoneal injury	9 (32.1)	1 (5.6)	0.033
Bleeding	0 (0.0)	0 (0.0)	1.000
Postoperative complications			
Seroma	3 (10.7)	2 (11.1)	0.966
Wound infection	1 (3.6)	0 (0.0)	0.418
Chronic pain	0 (0.0)	0 (0.0)	1.000
Postoperative recurrence	0 (0.0)	0 (0.0)	1.000

Values in parentheses are percentages

Surgical Process of TEP Repair



Operative Time During the Surgical Phases			
	HSAT (n=28)	LSAT (n=17)	<i>P</i> value
Operative time, min (median)			
Phase 1	20 (6–45)	15 (9–23)	0.043
1A	6 (1–22)	2.5 (1–10)	0.005
1B	11 (5–28)	13 (0–15)	0.762
Phase 2	15 (6–43)	25 (13–44)	0.051
Phase 3	29.5 (9–93)	34 (16–81)	0.365
Phase 4	16 (5–33)	12 (4–28)	0.281
Phase 5	15 (7–24)	11 (7–17)	0.100
Total	132 (73–255)	111 (63–167)	0.117

Intraoperative Complications During the Surgical Phases						
	Conversion			Peritoneal injury		
	HSAT	LSAT	<i>P</i> value	HSAT	LSAT	<i>P</i> value
Phase 1	2 (66.7)	0 (0.0)		3 (33.3)	1 (100.0)	0.644
Phase 2	1 (33.3)	0 (0.0)		2 (22.2)	0 (0.0)	
Phase 3	0 (0.0)	0 (0.0)		2 (22.2)	0 (0.0)	
Phase 4	0 (0.0)	0 (0.0)		2 (22.2)	0 (0.0)	
Phase 5	0 (0.0)	0 (0.0)		0 (0.0)	0 (0.0)	
Total	3	0	NA	9	1	
Values in parentheses are percentages						

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Conclusions

- Operative time was longer until **achieving to the Cooper’s ligament**, particularly during the **insertion of the first port** in HSAT.
- Peritoneal injury rate** was higher in HSAT, suggesting that high preSAT may be one factor causing TEP repair difficult.