

使用手術中胃鏡來協助年輕外科醫師在內視鏡袖狀胃切除手術中偵測狹窄處

The utility of intraoperative endoscopy to assist novice surgeons in the detection of gastric stenosis during laparoscopic sleeve gastrectomy

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Background:

Laparoscopic sleeve gastrectomy (LSG) is a commonly performed bariatric surgery. Gastric stenosis and leaks are 2 major complications associated with LSG and revision surgery might be needed. Herein, we report our experience of intraoperative endoscopy (IOE) to evaluate stenosis and leaks during LSG.

Methods:

LSG was performed by three surgeons. Patients who underwent LSG and IOE between January 2016 and March 2020 were enrolled and assigned to two groups: group 1 (1st–30th LSG case for each surgeon) and group 2 (> 30th LSG for each surgeon). Patients' anthropometric and biochemical data pre- and post-LSG, as well as IOE findings and follow-up esophagogastroduodenoscopy records were reviewed.

Results:

In total, 352 patients were enrolled including 90 patients in group 1 and 262 patients in group 2 (Table 1.). Three out of 352 patients (0.9%) were found to have stenosis by IOE, which was related to tightly gastropexy stitch or reinforcement stitch, all of which were in group 1. Stenosis was resolved after removal of the stitch during LSG. The incidence of gastric stenosis detected by IOE was 3.3% (3/90) and 0% (0/262) in group 1 and group 2, respectively ($P = 0.003$). No leakage was found in this study and no patient developed clinical or endoscopic stenosis after LSG. BMI, waist circumference, HbA1c, Triglyceride, uric acid, AST, ALT, significantly statistically decreased and HDL-C significantly statistically increased when patient received operation 6 months later. (Table 2)

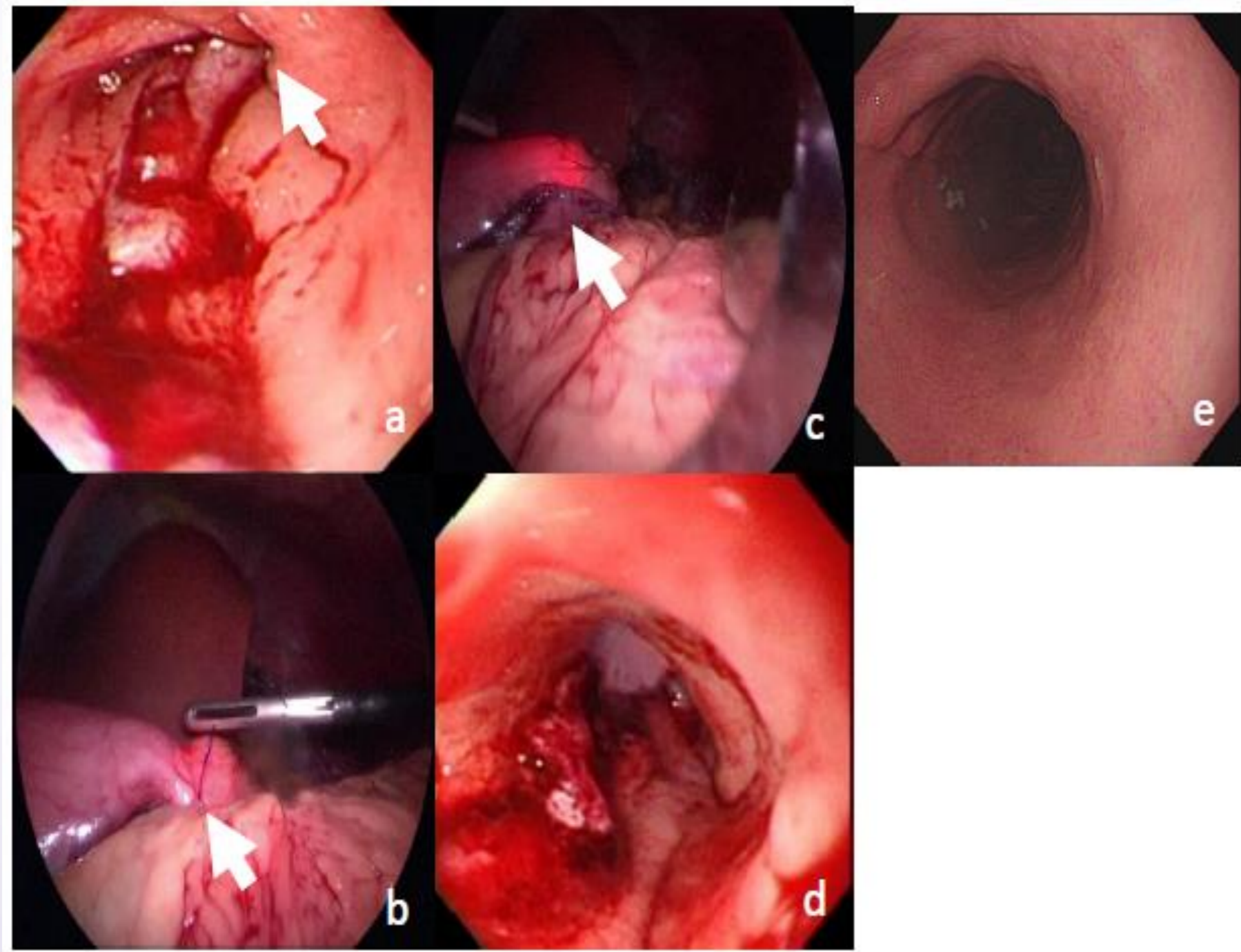


Figure. A. Endoscopy unable to pass through the incisura angularis of the sleeve (white arrow). B. The surgeon located the posterior stitch which fixed the sleeve to the pre-pancreatic fat (white arrow). C. The posterior stitch was removed (white arrow). D. Endoscopic view of the relieved incisura angularis. E. Gastroscopy showed no stenosis at stomach 6 months post-surgery.

Characteristics	Total n=352	Group 1 n=90	Group 2 n=262	p
Age (years), mean (SD)	35.8(9.7)	36.1(10.3)	35.7(9.5)	0.714
Male sex, n (%)	167 (47.4)	48(53.3)	119(45.4)	0.222
BMI (kg/m ²), mean (SD)	40.6(5.9)	39.6(5.5)	41.0(6.0)	0.048
Waist circumference (cm), mean (SD)	117.6(19.5)	117.8(14.9)	119.4(15.0)	0.404
DM, n (%)	104 (29.5)	29(32.2)	75(28.6)	0.592
Hypertension, n (%)	218 (61.9)	43(47.8)	175(66.8)	0.004
HbA1c (%), mean (SD)	6.5(1.6)	6.6(1.9)	6.5(1.4)	0.583
Total cholesterol (mg/dl), mean (SD)	199.2(39.8)	199.9(38.9)	198.9(40.2)	0.844
Triglycerides (mg/dl), mean (SD)	172.3(183.9)	186.2(210.5)	167.4(173.8)	0.42
HDL-C (mg/dl), mean (SD)	46.0(10.1)	47.6(11.2)	45.4(9.7)	0.093
LDL-C (mg/dl), mean (SD)	121.1(35.1)	119.6(36.9)	121.7(34.6)	0.630
Uric acid (mg/dL), mean (SD)	6.8(1.8)	7.0(1.9)	6.7(1.8)	0.163
AST (U/L), mean (SD)	38.8(30.9)	37.2(27.5)	39.4(32.0)	0.563
ALT (U/L), mean (SD)	58.8(51.9)	58.3(52.4)	58.9(51.9)	0.917

Table 1. Comparisons of baseline anthropometric and biochemical measurements between group 1 and group 2

BMI, body mass index; DM, diabetes mellitus; HbA1c, glycated hemoglobin; HDL-C, high density lipoprotein cholesterol; LDL-C, low density lipoprotein cholesterol; AST, aspartate transaminase; ALT, alanine transaminase; SD, standard deviation; No., number

Table 2. Comparison of clinical characteristics and endoscopic findings of 101 patients at baseline and 6 months after sleeve gastrectomy

	Baseline n=101	6 months n=101	p
BMI (kg/m ²), mean (SD)	41.2 (6.4)	30.7 (5.5)	<0.001
Waist circumference (cm), mean (SD)	120.3 (14.7)	97.0 (12.5)	<0.001
HbA1c (%), mean (SD)	6.5 (1.5)	5.5 (0.4)	<0.001
Total cholesterol (mg/dL), mean (SD)	196.2 (36.5)	188.5 (37.8)	0.075
Triglyceride (mg/dL), mean (SD)	152.4 (66.3)	86.0 (36.2)	<0.001
HDL-C (mg/dL), mean (SD)	47.1 (9.6)	50.9 (11.3)	<0.001
LDL-C (mg/dL), mean (SD)	119.2 (35.0)	111.7 (35.3)	0.056
Uric acid (mg/dL), mean (SD)	6.5 (1.6)	6.0 (1.6)	0.001
AST (U/L), mean (SD)	40.4 (32.4)	19.4 (5.0)	<0.001
ALT (U/L), mean (SD)	57.9 (53.5)	18.2 (8.5)	<0.001
Endoscopic finding			
Gastric stenosis, n (%)	-	0	-
Gastric leak, n (%)	-	0	-

BMI, body mass index; HbA1c, glycated hemoglobin; HDL-C, high density lipoprotein cholesterol; LDL-C, low density lipoprotein cholesterol; AST, aspartate transaminase; ALT, alanine transaminase; SD, standard deviation

Conclusion

The existing evidence showed that IOE can help detect gastric stenosis during LSG, especially for novice surgeons, and the stenosis could be resolved during operation.