



The impact of preoperative NLR on postoperative weight loss and DM remission in sleeve gastrectomy.



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COI Disclosure Information

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I have no financial relationship to disclose.

Abstract

Introduction: The state of obesity showed impaired immunity. The aim of this study is to investigate the impact of neutrophil-lymphocyte ratio (NLR) in sleeve gastrectomy (SG).

Patients and methods: Fifteen obese patients: five males and ten females; age range from thirty-three years to fifty-six years (mean age 42.7 years); mean body weight (BW) 127.5kg; mean body mass index (BMI) 46.7kg/m²; ten with diabetes who underwent SG were enrolled in this study. The impact of preoperative NLR on percent excess weight loss (%EWL) and remission of diabetes in postoperative 1 year were examined.

Results: The %EWL at three, six months and one year post-operative were 45.6%, 49.5% and 46.3%, respectively. Improvements were also evident in diabetes at postoperative one year; CR (No medication and HbA1c<6.0%) 40%, PR (HbA1c<6.5) 20%, Improve (Decrease of anti DM drug and HbA1c<7.0%) 40%. Comparing preoperative NLR in %EWL<50% and ≥50% in postoperative 1 year, <50% was 2.64 and ≥50% was 2.03 (p<0.05). NLR in CR and PR groups was significantly lower than that in Improve group (2.22 vs 3.27, p<0.05).

Conclusion: Preoperative NLR may be a predictive marker of weight loss and improving DM after SG

Introduction

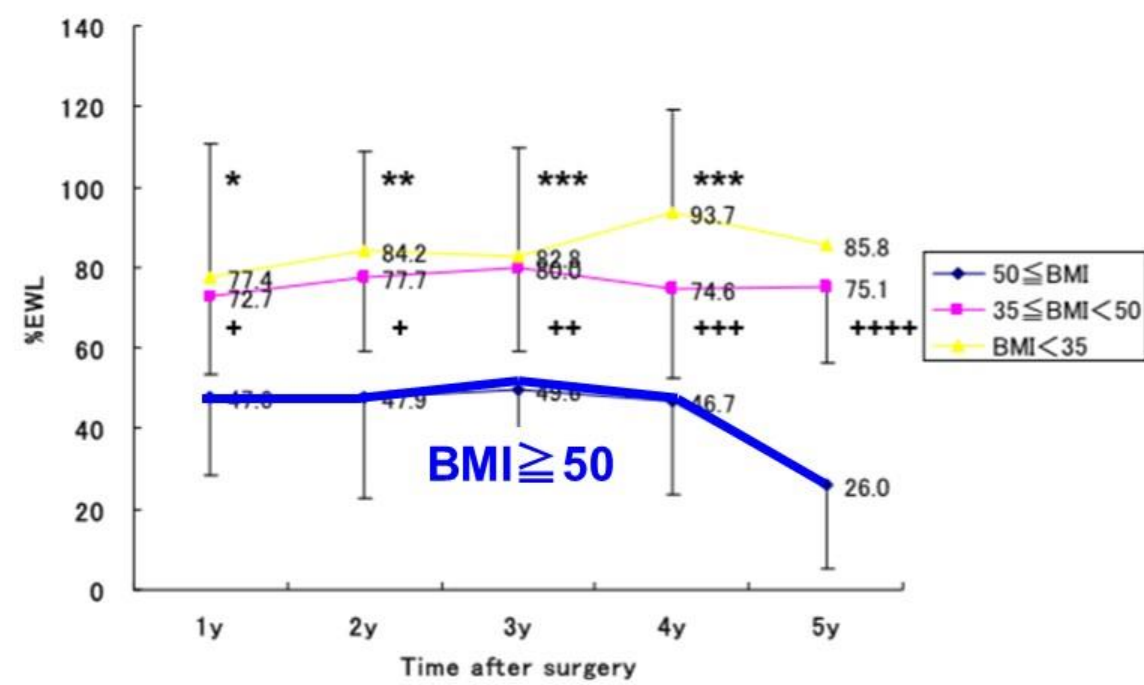
ABCD score

Variables and point values used for the computation of the ABCD score [®]				
Variable	Points on ABCD index			
	0	1	2	3
Age	≥40	<40		
BMI (kg/m ²)	<27	27–34.9	35–41.9	≥42
C-peptide (mmol/L)	<2	2–2.9	3–4.9	≥5
Duration of DM (yr)	>8	4–8	1–3.9	<1

LSG was recommended for T2DM patients with high ABCD score.

SG: Sleeve gastrectomy
(Surg Obes Relat Dis. 2015)

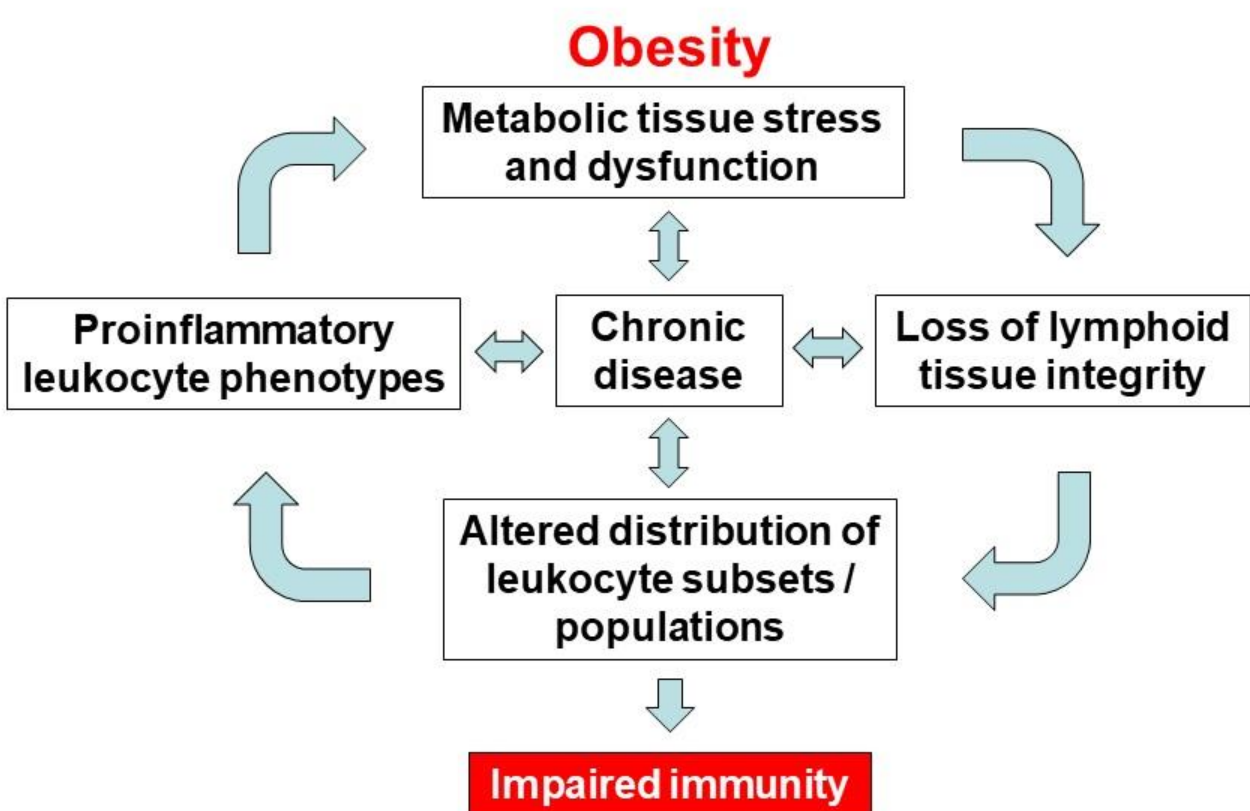
Prediction of postop. weight loss



Preop. BMI ≥ 50 showed poor postoperative weight loss.

(Obes Surg. 2016)

Impact of obesity on immunity



(Adv Nutr. 2016)

Correlation between DM and NLR

NLR; neutrophil-to-lymphocyte ratio

	DPN (-)	DPN (+)	P value
HbA1c	7.87±2.21	8.10±2.33	0.296
NLR	2.18±0.61	2.58±0.50	<0.001
Neutrophil (× 10 ⁹ /L)	3.80±1.23	4.04±1.05	0.022
Lymphocyte (× 10 ⁹ /L)	1.84±0.75	1.61±0.47	<0.001

DPN; Diabetic Peripheral Neuropathy

NLR was significantly correlated with DPN.
⇒ NLR was correlated with severity of DM.

(Medicine. 2017)

NLR in bariatric surgery

NLR; neutrophil-to-lymphocyte ratio

Association between POD1 NLR ≥ 10 and short-term clinical outcomes in LSG

30-Day clinical outcomes	OR	95 % CI	p value
Overall complication	1.98	1.01–3.87	0.046*
Major complication	3.71	1.76–7.82	<0.001*
Reoperation	3.63	1.14–11.6	0.029*
Readmission	2.30	0.93–5.68	0.27
Prolonged hospital LOS (>2 days)	3.70	2.20–6.22	<0.001*

CI confidence interval, LOS length of stay, OR odds ratio

NLR was associated with 30-day outcomes after LSG.

(Surg Endosc. 2017)

Aim

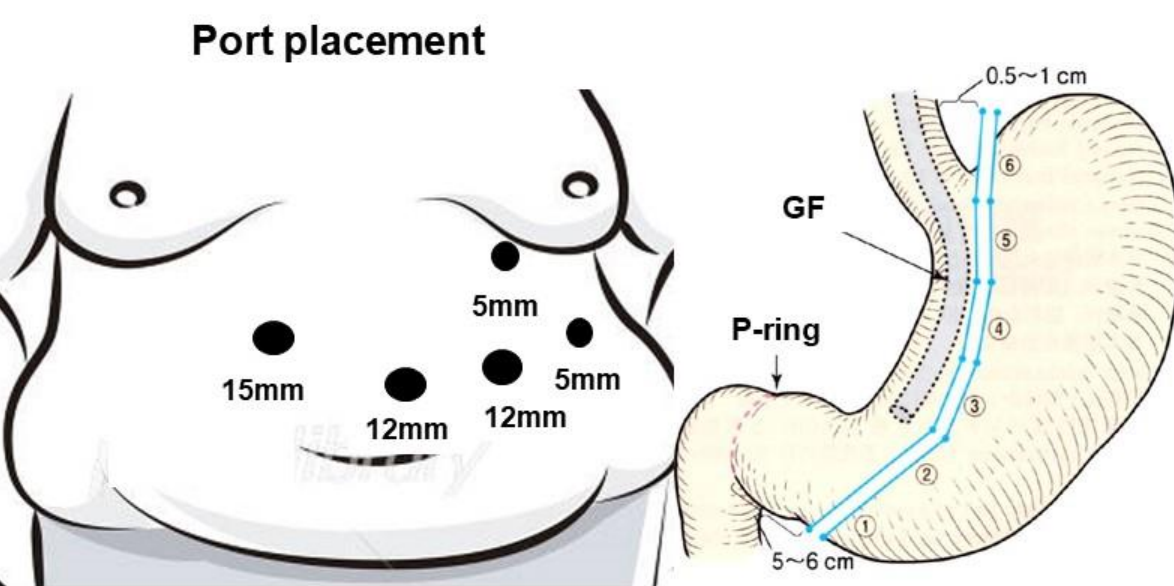
To investigate the impact of preoperative NLR on postoperative weight loss and DM remission in SG.

Methods

15 obese patients who underwent SG

Age	42.7±7.2 (33-56)
Gender (M / F)	5 / 10
LSG / SG	13 / 2
BW (kg)	127.5±24.3 (88-166)
BMI (kg / m ²)	46.7±8.4 (33.2-60.1)
Comorbidity	DM 10/ HT 11/ HL 6/ SAS 11

Laparoscopic sleeve gastrectomy - LSG -



UMIN: R000030188

1. The effect of SG

Short-term outcomes

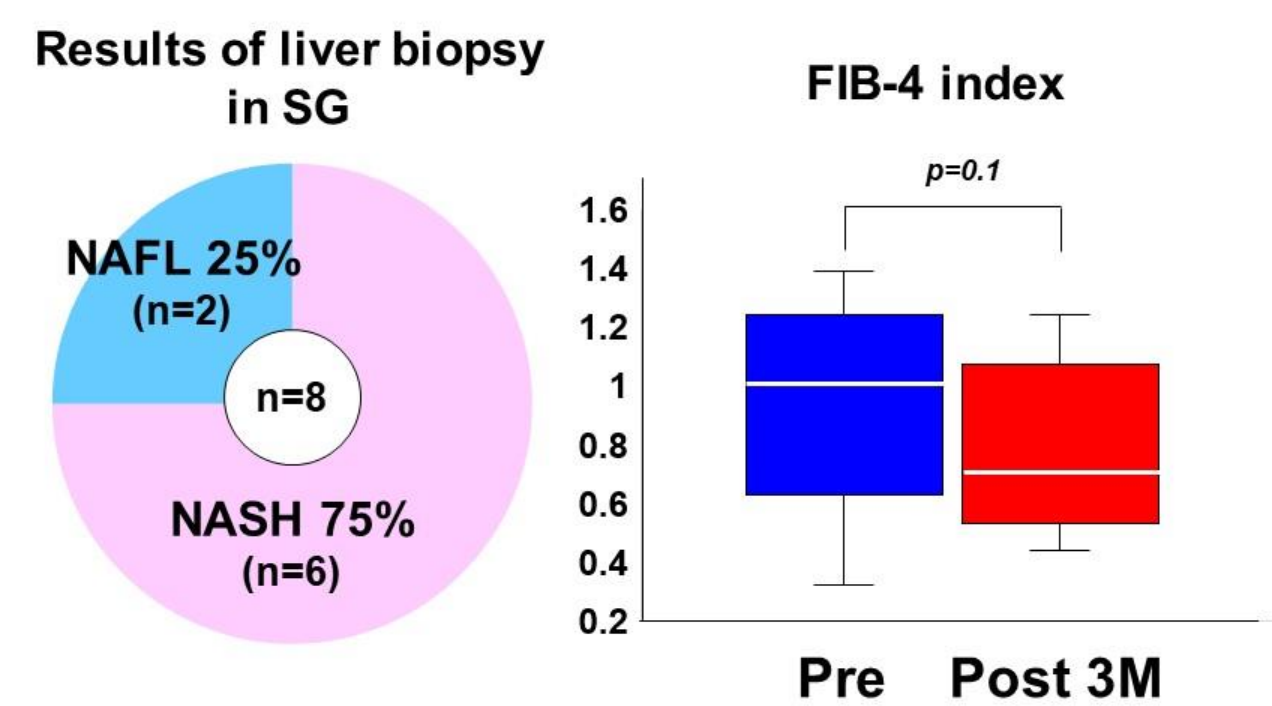
Factors	n=15
Operation time (min.)	252.1±39.2
Blood loss (ml)	62.6±18.8
Removed stomach (ml)	616.4±222.6
Postoperative complication (%)	0
Postoperative hospital stay (days)	30.7±8.5

Long-term outcomes

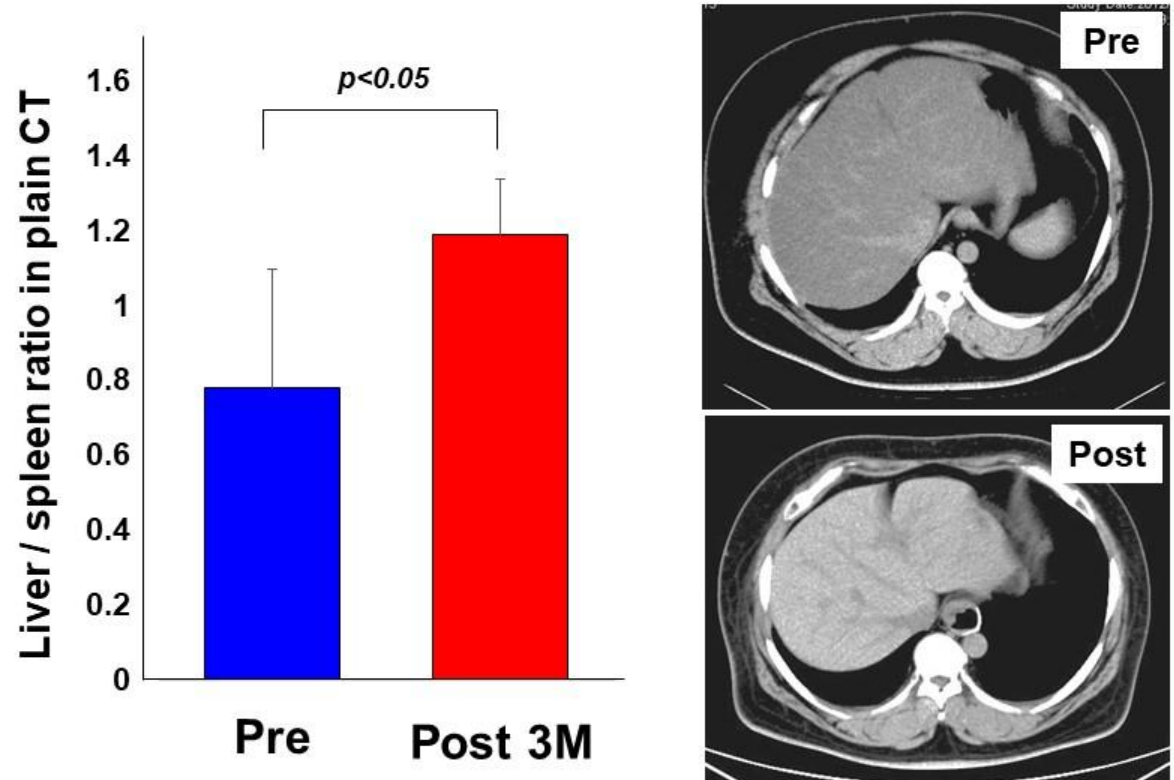
%EWL Post 3M (%)	45.6 (35.5 – 60.0)
Post 6M (%)	49.5 (32.0 – 61.6)
Post 12M (%)	46.3 (35.5 – 62.6)
Improvement of comorbidity (%)	DM CR40/ PR20/ Improve40 HT 64 HL 67 SAS 91

%EWL= (Pre BW- Post BW) / (Pre BW – ideal BW)
CR: No medication and HbA1c<6.0%
PR: HbA1c<6.5
Improve: Decrease of anti DM drug and HbA1c<7.0%

The impact on NASH

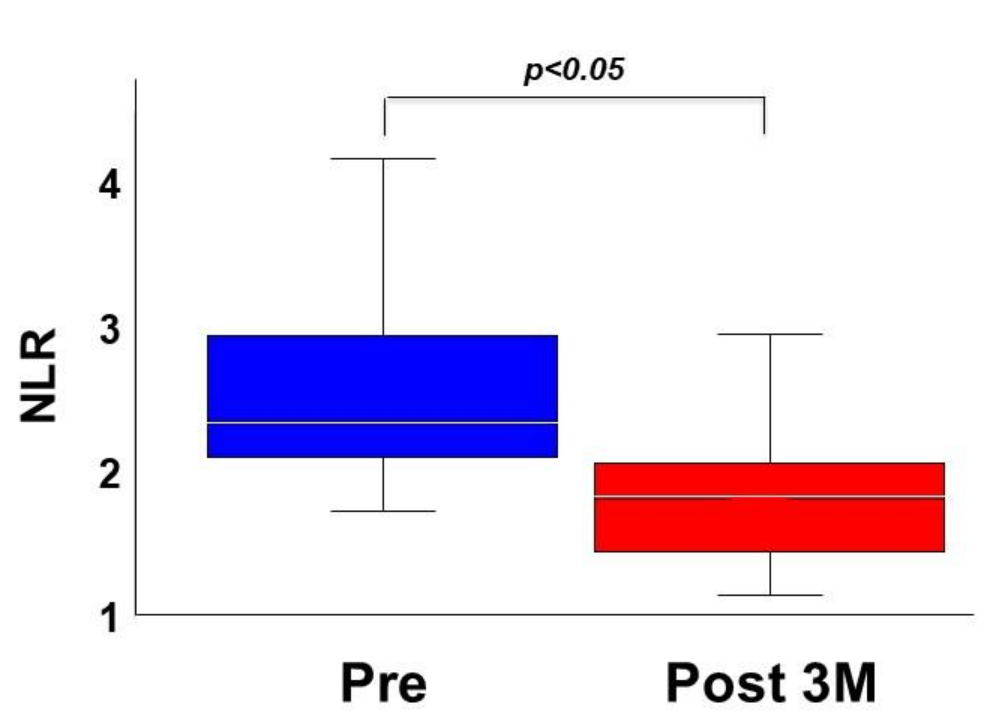


The impact on NASH



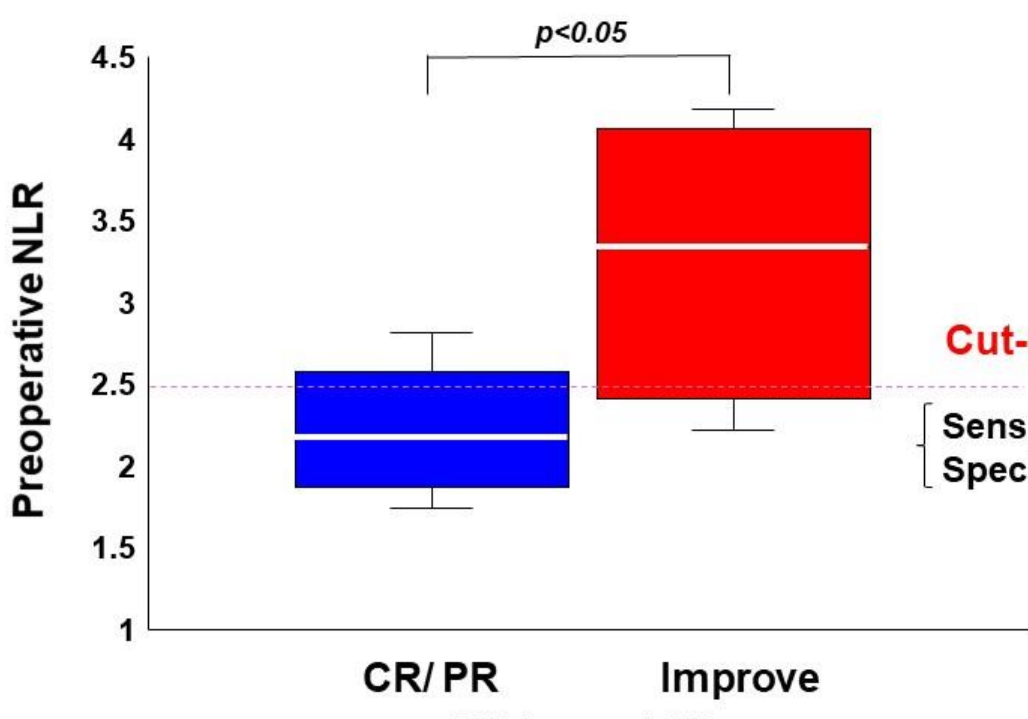
2. The role of NLR in SG

Change of NLR in SG



NLR=neutrophil-lymphocyte ratio

Correlation between NLR and DM

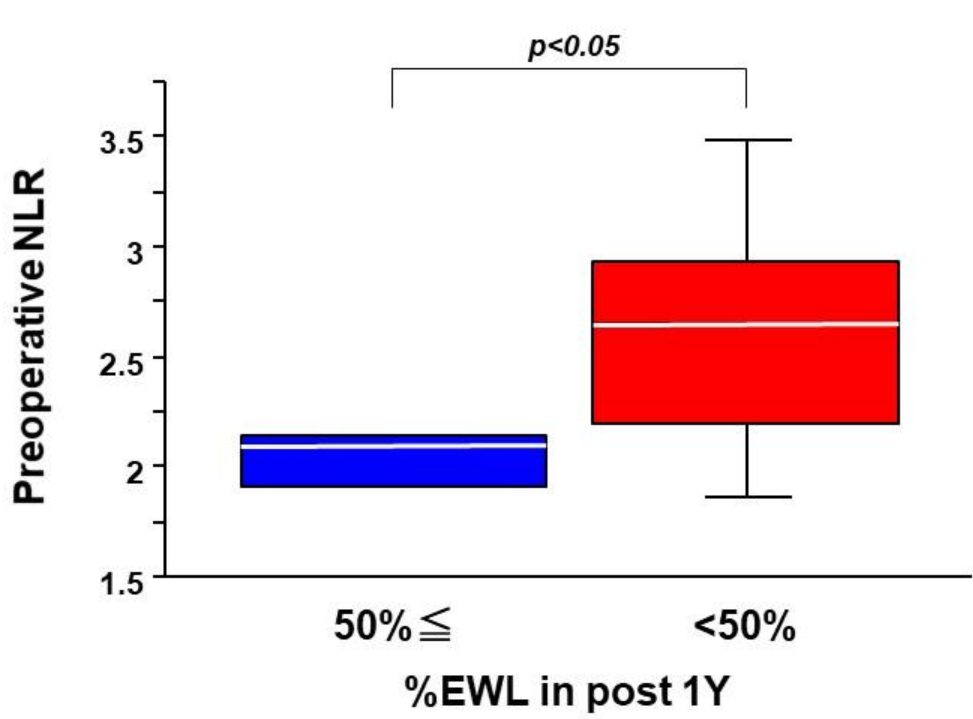


Preoperative factors and DM

Preoperative factors	DM in post 1Y		p value
	CR/ PR	Improve	
Age (y.o.)	41.5±4.9	43.8±5.4	0.56
BW (kg)	130.8±22.0	109.0±19.5	0.19
BMI (kg/m ²)	45.5±8.1	40.1±3.5	0.30
HbA1c	7.4±0.8	7.5±0.8	0.96
C peptide	2.93±1.41	4.02±1.11	0.39
ABCD score	4.67±1.89	4.5±0.5	0.88
NLR	2.22±0.36	3.27±0.74	<0.05
PNI	51.8±1.92	48.0±7.80	0.34

NLR was identified as the predictive factor of DM remission.

Correlation between NLR and %EWL



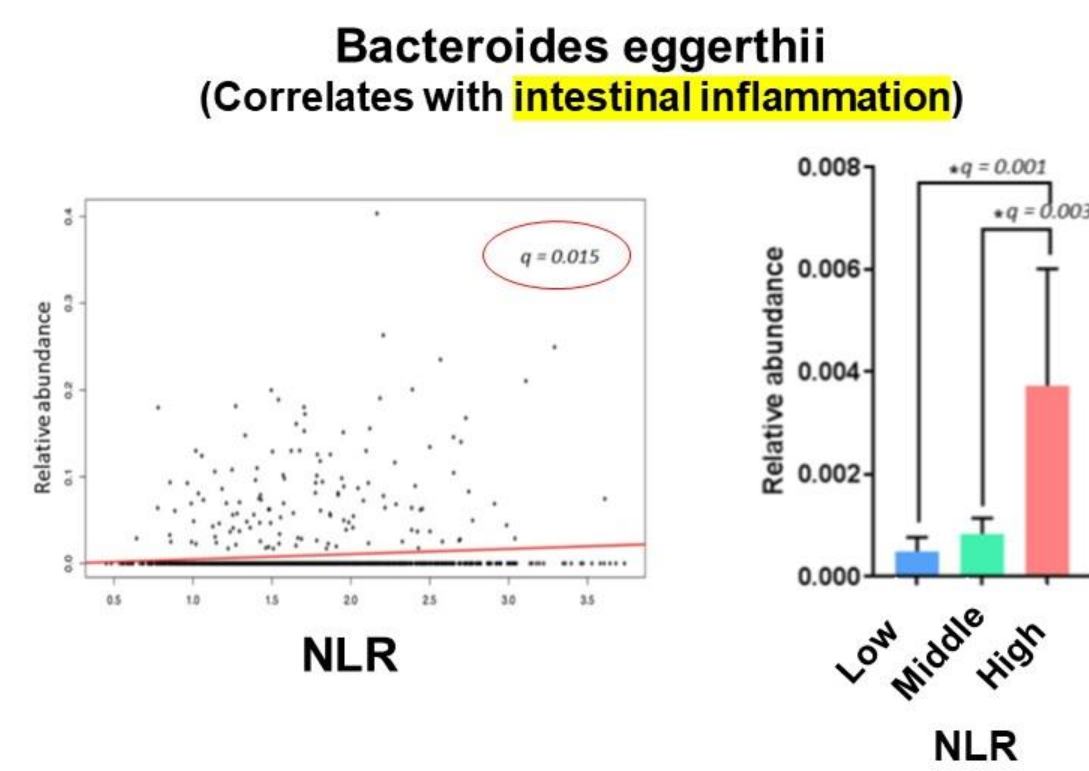
The preoperative factors and %EWL

Preoperative factors	%EWL in post 1Y		p value
	<50%	50%≤	
Age (y.o.)	42.5±7.5	42.4±7.8	0.98
Gender (M / F)	3 / 5	2 / 3	0.93
BW (kg)	124.4±26.3	135.8±21.3	0.47
BMI (kg/m ²)	46.1±8.3	49.6±7.1	0.49
DM (+ / -)	5 / 3	3 / 2	0.93
Preop. weight loss (%)	11.7±5.4	12.4±5.5	0.84
ABCD score	4.20±0.75	5.33±1.25	0.37
NLR	2.64±0.60	2.03±0.17	<0.05
PNI	49.7±4.7	45.1±6.5	0.25

NLR was identified as the predictive factor of postop. weight loss.

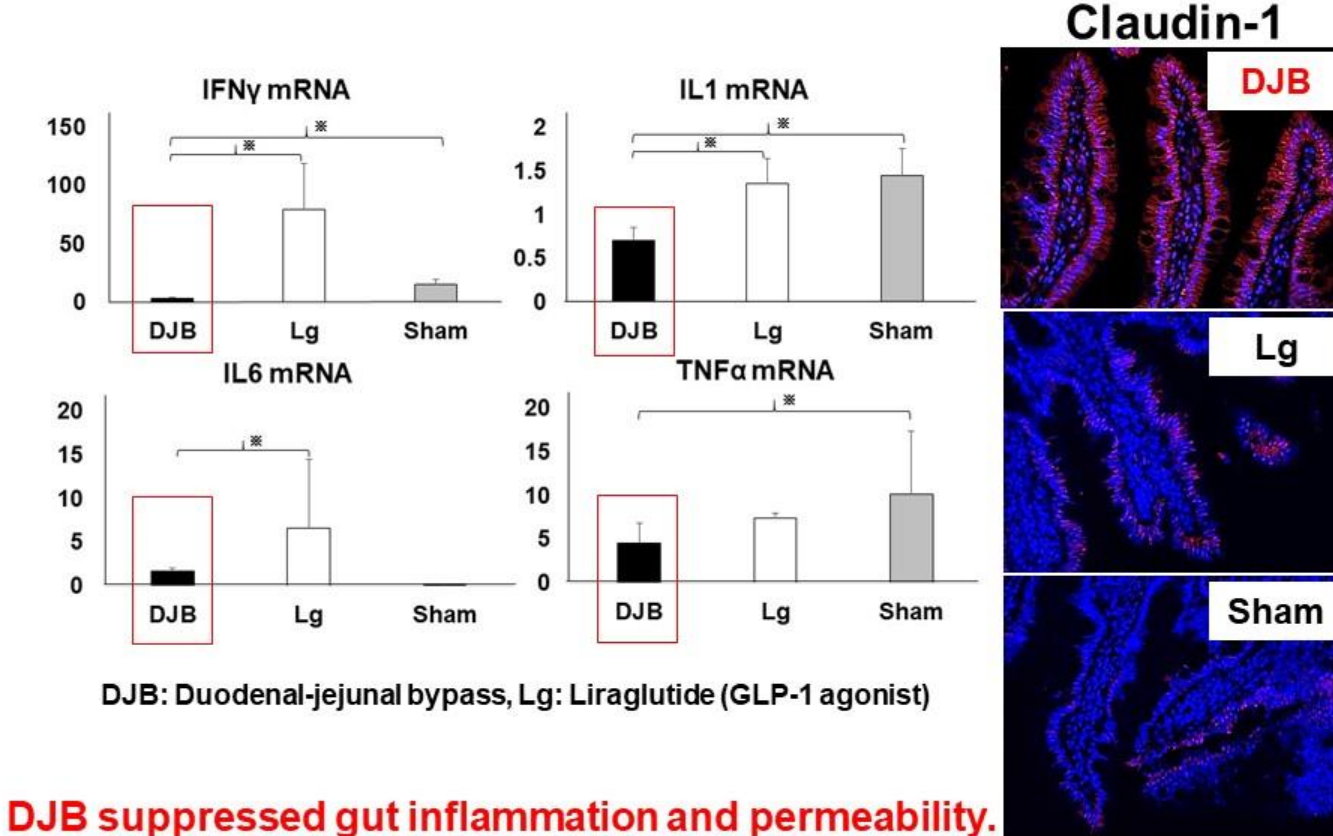
Discussions

NLR and intestinal inflammation



NLR is a marker of intestinal inflammation, which reflects gut microbiota.
(Sci Rep. 2018)

Gut inflammation and permeability in DJB



DJB suppressed gut inflammation and permeability.

(Kashihara H, et al. Obes Surg. 2019)

Conclusion

Preoperative NLR may be a predictive marker of weight loss and DM remission after SG.