Single Centre Retrospective Analysis of Early Marginal Ulcers after Metabolic Bariatric Procedures

Szewczyk A.R., Eid J., Schöppl S., Kampl T., Weidinger G., Kabalan E., Weigt V., Karacayir B., Schwanzer E. & Beckerhinn P.

Department of Surgery
Landesklinikum Hollabrunn, Austria

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I have the following potential conflict(s) of interest to report:

- Receipt of grants/research supports: DACH Medical Group

BACKGROUND

Marginal ulcer mean incidence up to 20%

Multifactorial pathophysiology:
→ lifestyle-related risk factors: smoking, alcohol, NSAID use, …
→ comorbidity-related risk factors: type II diabetes, *Helicobacter pylori,* immunosuppression, …
→ surgery technique: circular GJ anastomosis, large pouch volume, nonabsorbable sutures, …

Symptoms: asymptomatic
vs. abdominal pain (varying degree), nausea/vomiting, gastrointestinal bleeding, perforation

Management/treatment:
- Conservative (high dose PPI, lifestyle-related adaptations)
- Endoscopic
- Surgical (suture repair, GJ reanastomosis)

Salame M, Jawhar N, Belluzzi A, Al-Kordi M, Storm AC, Abu Dayyeh BK, Ghanem OM. Marginal Ulcers after Roux-en-Y Gastric Bypass: Etiology, Diagnosis, and Management. J Clin Med. 2023 Jun 28;12(13):4336. doi: 10.3390/jcm12134336. PMID: 37445371; PMCID: PMC10342478.
Süsstrunk J, Wartmann L, Mattiello D, Köstler T, Zingg U. Incidence and Prognostic Factors for the Development of Symptomatic and Asymptomatic Marginal Ulcers After Roux-en-Y Gastric Bypass Procedures. Obes Surg. 2021 Jul;31(7):3005-3014. doi: 10.1007/s11695-021-05363-4. Epub 2021 Mar 24. PMID: 33761070.
Wynn M, Tecson KM, Provost D. Marginal ulcers and associated risk factors after Roux-en-Y gastric bypass. Proc (Bayl Univ Med Cent). 2022 Nov 3;36(2):171-177. doi: 10.1080/08998280.2022.2137362.

BACKGROUND

Classification
- Early: within 3 months after surgery
- Mid: 3 to 12 months after surgery
- Late: 12 months after surgery

EMU incidence up to 5%

Normal healing typically occurs within 6 to 8 weeks
→ theory of prolonged healing or point of ischaemia

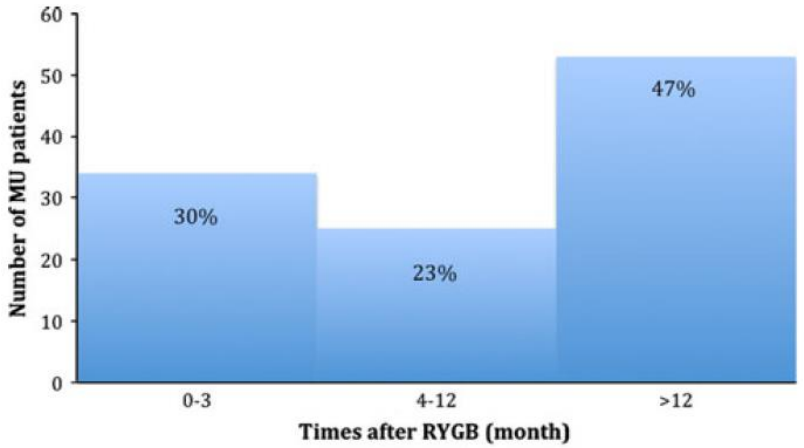


Fig. 3 Interval between index operation and diagnosis of marginal ulcer

Late MUs probably more likely to be developed due to known risk factors (smoking, insufficiently treated diabetes etc.)

El-Hayek K, Timratana P, Shimizu H, Chand B. Marginal ulcer after Roux-en-Y gastric bypass: what have we really learned? Surg Endosc. 2012 Oct;26(10):2789-96. doi: 10.1007/s00464-012-2280-x. Epub 2012 Apr 28.
Cornejo J, Evans LA, Celik NB, Elli EF. Early Marginal Ulcer After Roux-en-Y Gastric Bypass: MBSAQIP Database Analysis of Trends and Predictive Factors. Obes Surg. 2024 May;34(5):1536-1543. doi: 10.1007/s11695-024-07179-4.

OBJECTIVES & METHODS

→ incidence of EMU
→ associated risk factors
→ EMU management

- single-centre retrospective analysis
- MU within 90 days after MBS (primary & revisional) detected on upper GI endoscopy
- January 2022–December 2023
- basic demographics, type of surgery, GJ anastomosis technique, limb length, risk factors, 90-day postoperative outcomes

HOW WE DO IT

- Preoperative assessment: surgery, anaesthesia, psychologist, physiotherapist, dietician
- Preoperative gastroscopy + histology, ultrasound, clearing for surgery, lung function testing etc.
- Majority RYGB

- GJ Technique: < 2021 majority circular, 2022/2023 change to linear, 2024 > majority linear
- Limb length: 150/50 or 50/150
- 2024 > intraoperative upper GI endoscopy

- Postoperative oral contrast swallow
- 8 weeks PPI
- 3 months dietary follow-up
- 6 months surgical follow-up → every 6 months <2 years
- 2> years annual follow-up

- No routine postoperative upper GI endoscopy unless patients present with symptoms!

BASELINE CHARACTERISTICS

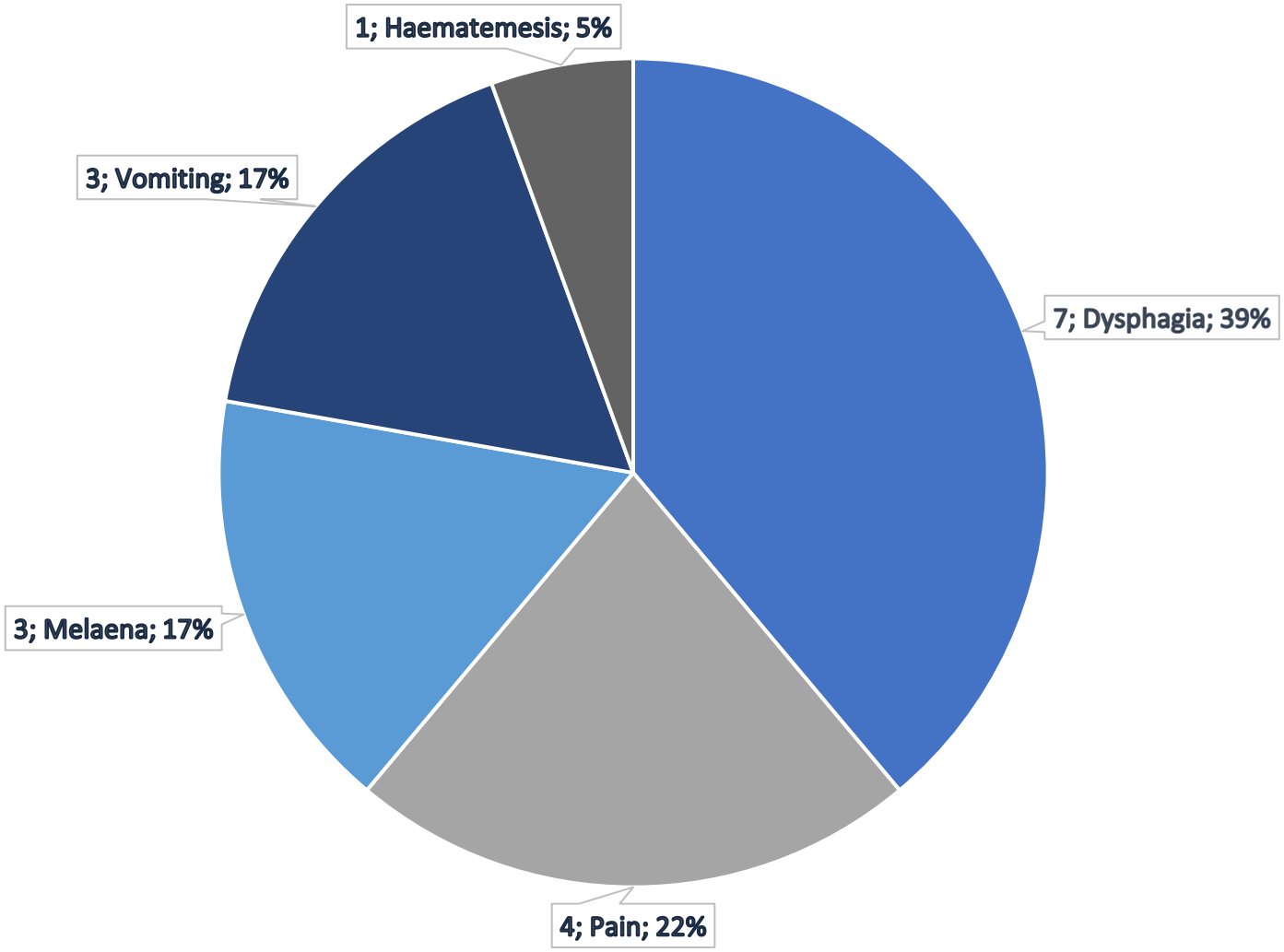
	Study cohort n = 556	Early Marginal Ulcer n = 18
Female sex – n (%)	409 (73.6)	16 (88.9)
Age at procedure (years) – mean (SD)	40.75 (± 12.38)	38.72 (± 12.95)
BMI (kg/m^2) – mean (SD)	44.71 (±6.52)	44.24 (±9.5)
Circular GJ – n (%)	330 (59.35)	13 (72.2)
LL 150cm biliopancreatic, 50cm alimentary – n (%)	201 (36.15)	8 (44.4)
History of smoking – n (%)	244 (43.88)	7 (38.99)
Type II diabetes – n (%)	77 (13.85)	3 (16.7)
H. pylori – n (%)	69 (12.84)	2 (11.1)
Surgery – EMU (days) – mean (SD)		54.00 (± 32.59)
Clavien-Dindo classification – n (%) - I - II - IIIa - IIIb		- 17 (94.4) - 1 (5.6)

PREOPERATIVE LABORATORY RESULTS

	Mean value	SD	Reference value
Haemoglobin (g/dL)	14.08	± 1.15	Female: 12–16 Male: 14–18
Haematocrit (%)	42.61	± 3.54	Female: 37–47 Male: 42–50
MCV (fL)	86.68	± 5.33	80–98
Total iron (µg/dL)	95.07	± 26.71	50–150
Ferritin (ng/mL)	133.75	± 92.74	Female: 24–307 Male: 24–336
Fasting glucose (mg/dL)	90.59	± 18.19	70–99
GOT/AST (U/L)	24.73	± 10.99	10–40
GPT/ALT (U/L)	31.53	± 19.01	10–40
Albumin (g/dL)	4.23	± 0.19	3.5–5.5
Vitamin B12 (pg/mL)	413.12	± 131.11	200–800
Vitamin D (ng/mL)	28.33	± 4.16	5–75
Folate (ng/mL)	7.5	± 8.54	1.8–9.0

Reference values: https://emedicine.medscape.com/article/2172316-overview?form=fpf

EMU SYMPTOMS



EMU ASSOCIATED RISK FACTORS

	P value	OR	KI
Gender	0.209	3.51	0.44–28.06
Smoking	0.587	1.46	0.40–4.98
Alcohol	0.448	1.71	0.42–7.01
H. pylori	0.228	1.77	0.70–8.45
Type II Diabetes	0.214	2.11	0.66–6.81
Hypertension	0.414	1.41	0.41–3.73
Circular GJ technique	0.532	1.37	0.51–3.71
Long biliopancreatic LL	0.262	1.48	0.56–3.91
Procedure primary vs. revisional	0.005	4.67	1.45–15.04

RESULTS

- 556 patients (73.56% female) underwent MBS with anastomosis construction → 18 (3.2%) developed EMU
  - 14 (78%) primary RYGB
  - 4 (22%) conversional procedures
- Mean time between surgery and EMU diagnosis 54.00 ± 32.59 days
- 7 patients (39%) history of tobacco use
- 7 patients (39%) presented with dysphagia

- Significant association EMU: type of surgery (primary vs. revisional) (p = 0.005; OR = 4.67, 95% CI 1.45–15.04)

- No significant results comparing GJ technique (OR = 1.37) or history of smoking (OR = 1.46)

- One patient presented with ulcer perforation

- No mortalities

DISCUSSION

→ Heterogeneous compilation of risk factors and preoperative circumstances
→ Secondary (revisional) bariatric surgeries known to be associated with various postoperative complications
→ Circular GJ technique as safe as linear one regarding MU development
→ Smoking status?

Limitations:
- Retrospective analysis
- Small cohort
- Data on possible risk factors and their evolution over time
- Only symptomatic patients

→ Analysis with a larger cohort and longer observational time will be needed to further support these results