



Le complicanze nutrizionali acute nel paziente post chirurgia bariatrica

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Aosp S. Maria Terni



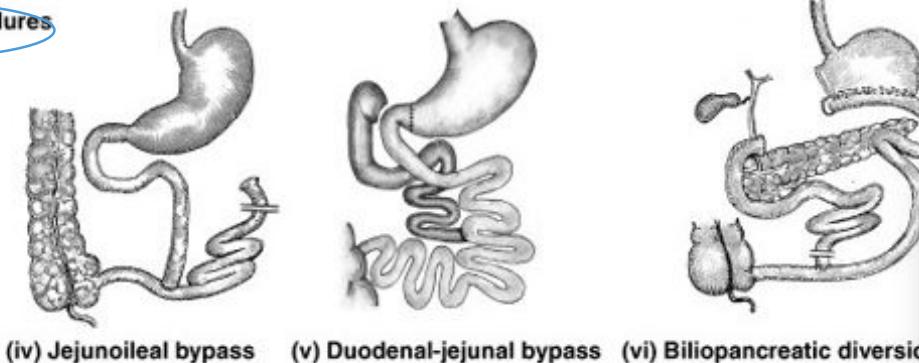
Oliver Curtis
Mona Lisa, Louvre, Paris, France.

'Surgical-Based Nutrition'...

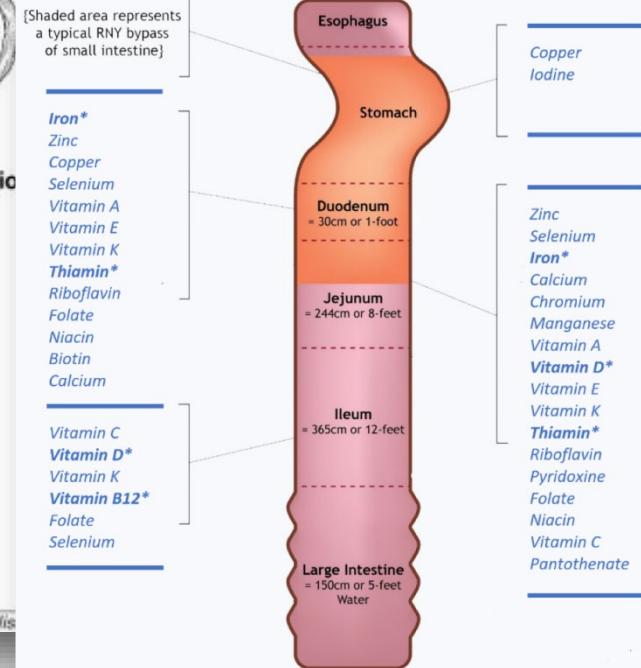
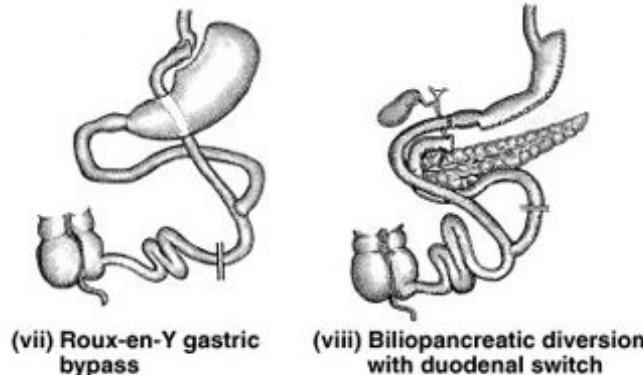
(b) Restrictive procedures



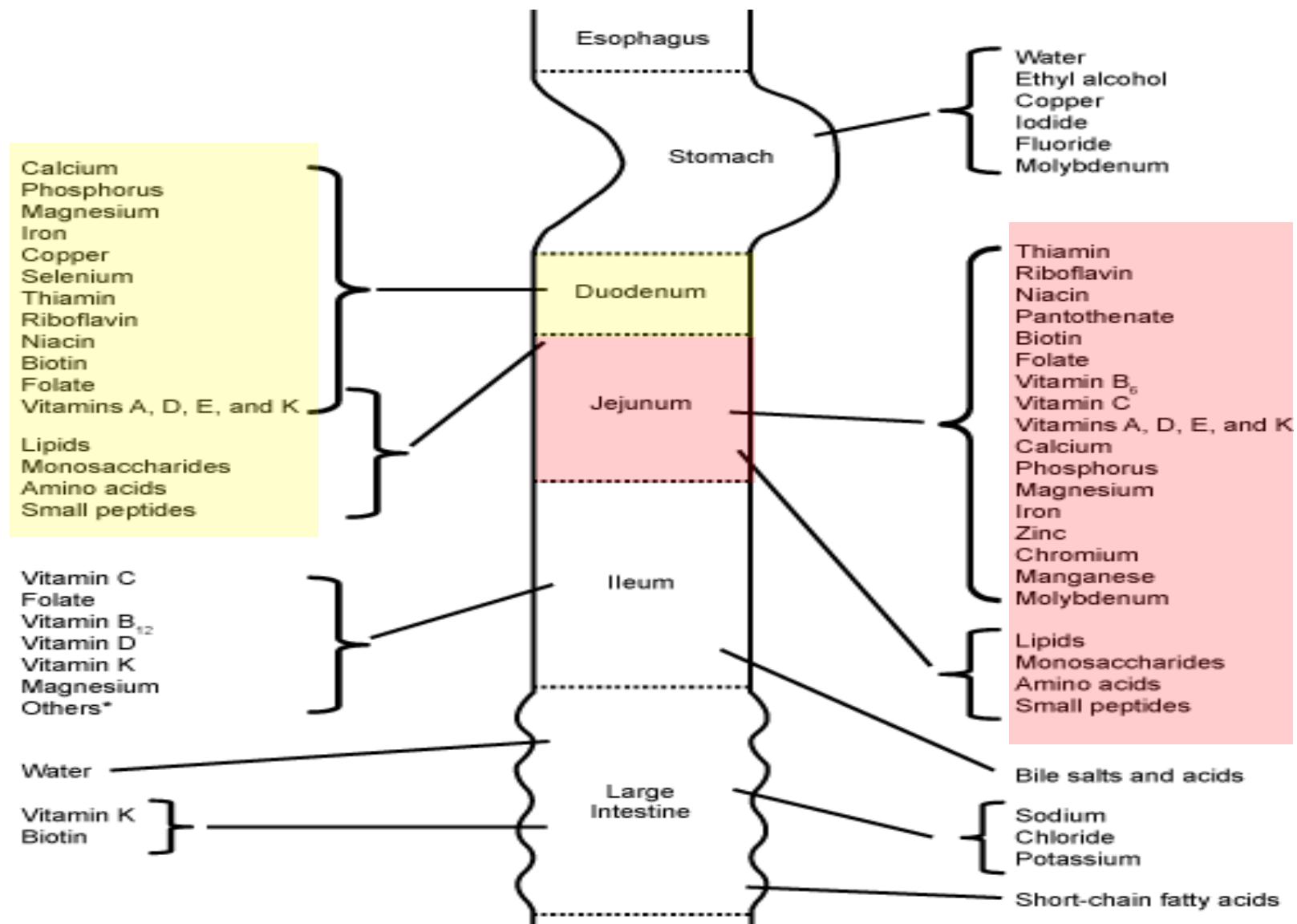
(c) Malabsorptive procedures

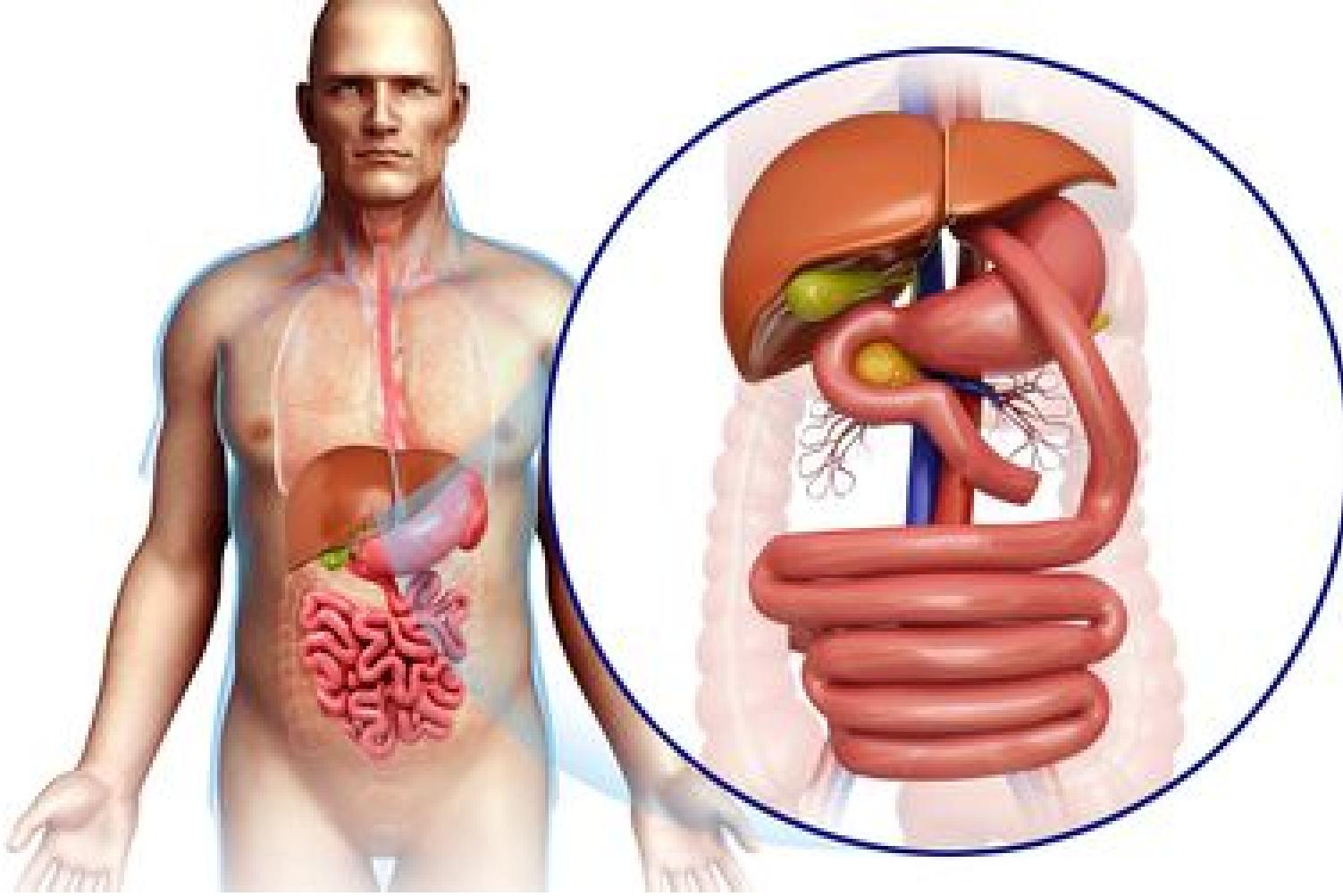


(d) Hybrid



...Nutritional deficiencies are more prone to occur after malabsorptive procedures...





...‘Patient-Based Nutrition’



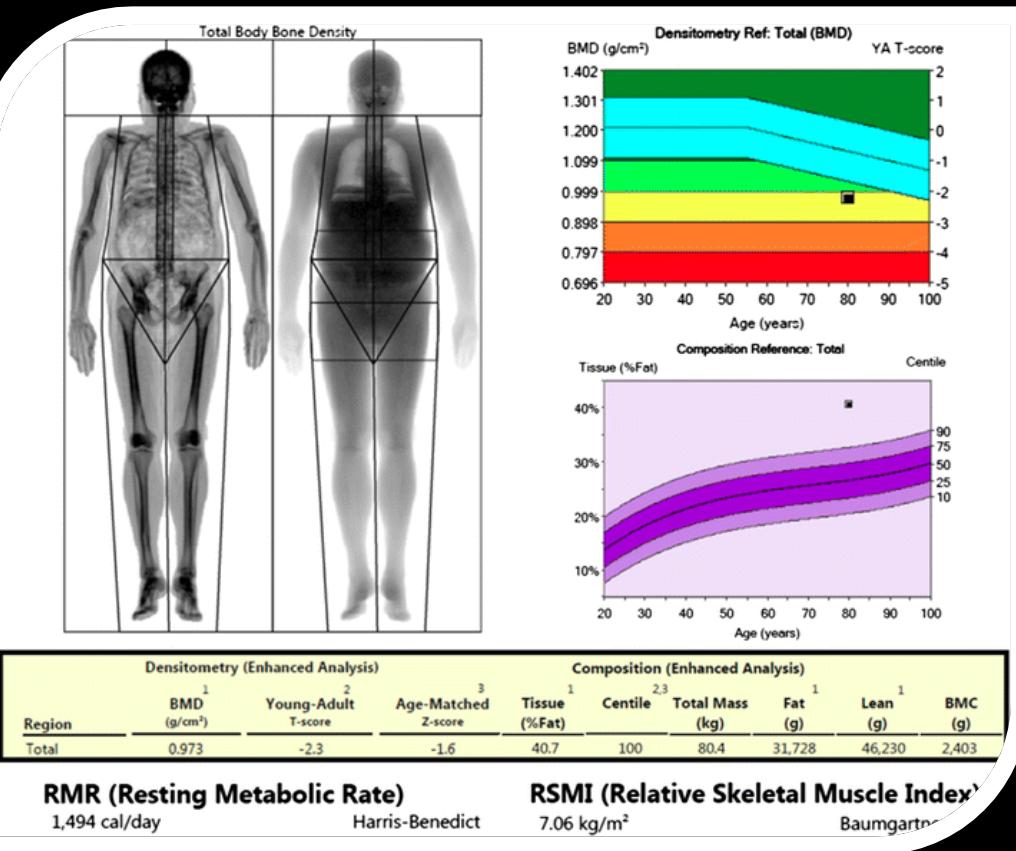
Prima...

...Prima della Chirurgia

- *Even though surgery can exacerbate preexisting nutrient deficiencies, preoperative screening for vitamin deficiencies has not been the norm.*
- Despite high-caloric intake, the deficiencies present appear to be related to the **poor quality** of the diet and low micronutrient intake, chronic inflammation status that affects iron metabolism, and small intestinal bacterial overgrowth (SIBO), which can lead to deficiencies in some vitamins (e.g., thiamin, vitamin B-12, and fat-soluble vitamins).

TIAMINA	29%
B12	18-30%
FOLATI	54%
FERRO	45%
VITAMINA D	90%
VITAMINA A/E	14-2%
RAME	70%

Daily multivitamin supplementation is recommended during the preoperative diet

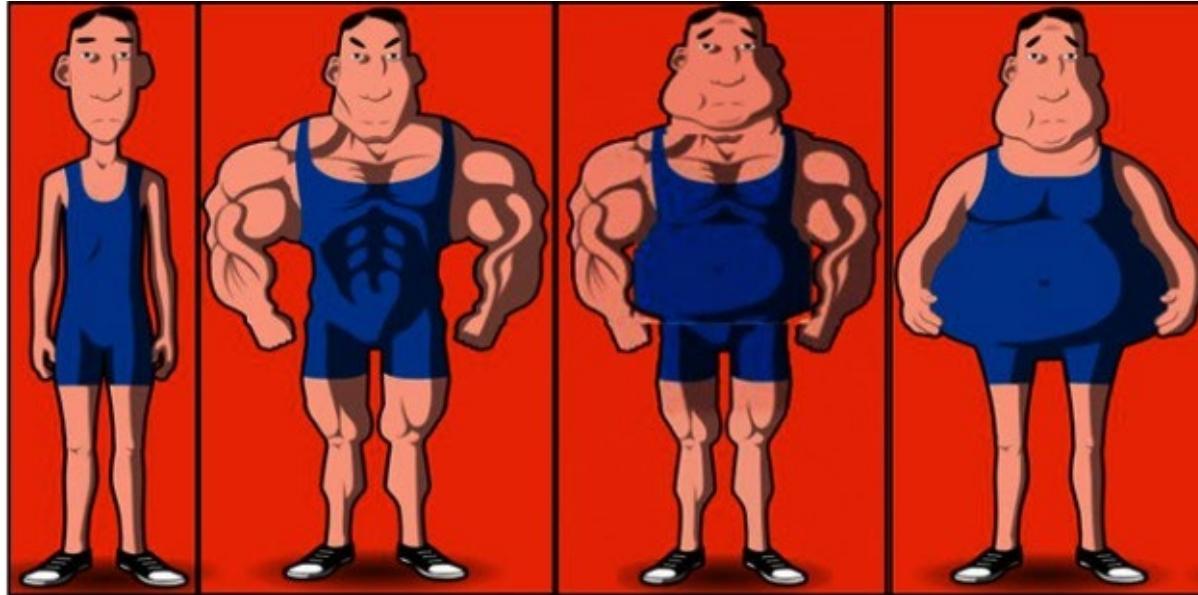


...“The prevalence of sarcopenia was 8% at surgery and rose to one third of patients one year after sleeve gastrectomy.”

Table 1. Methods for measurement of muscle mass, muscle strength, and physical performance

Muscle mass	Muscle strength	Physical performance
Anthropometry	Handgrip strength	Short physical performance battery
Computed tomography	Knee flexion/extension	Usual gait speed
Magnetic resonance imaging		Timed get-up-and-go test
Dual energy X-ray absorptiometry		
Bioimpedance analysis		

Body Composition and Obesity Phenotypes



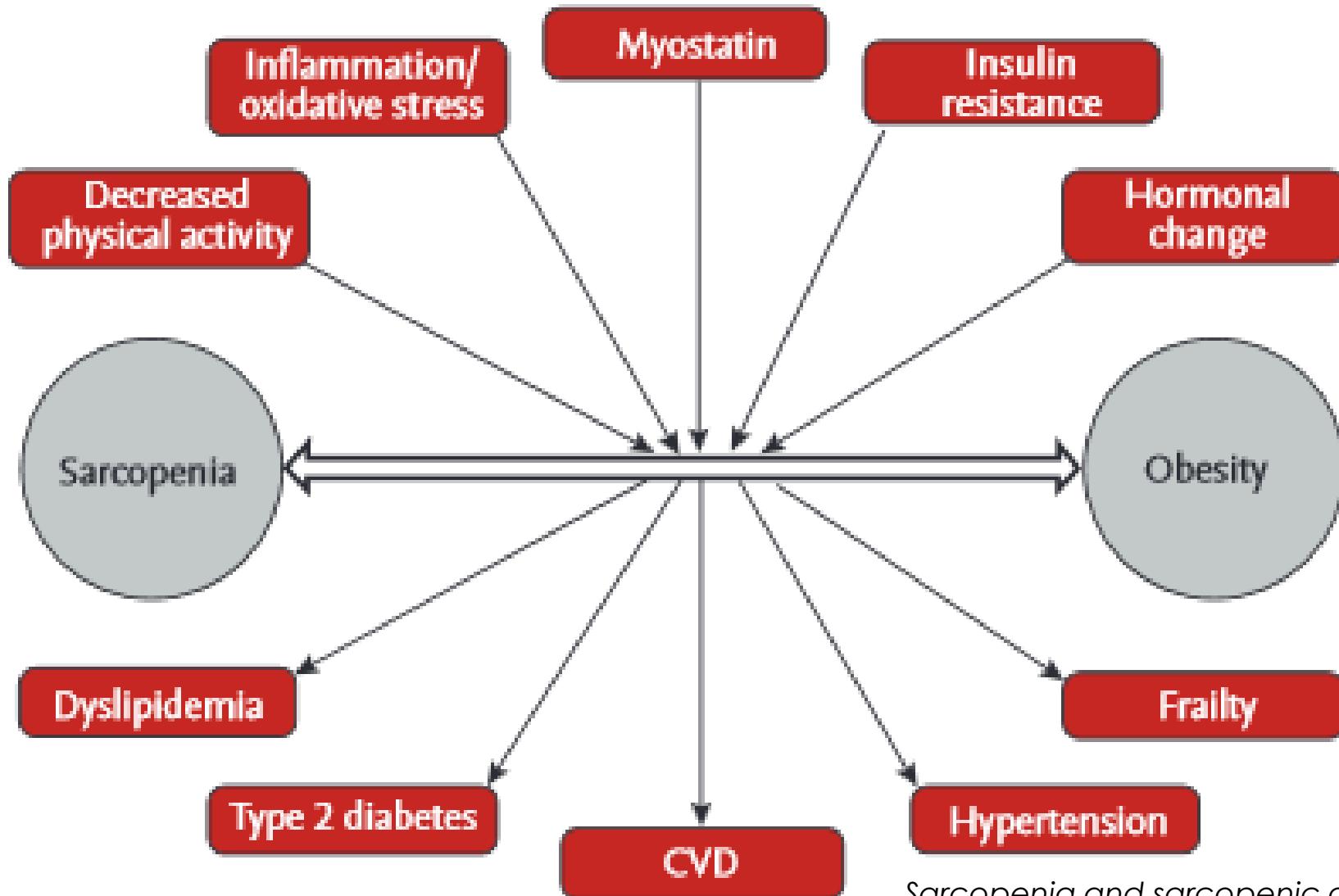
	Normal weight	Athlete	Nonsarcopenic Obese	Sarcopenic Obese
BMI (kg/m^2)	18.5-25	≥ 30	≥ 30	≥ 30
Fat Mass	Normal	Decreased	Increased	Increased
Lean Mass	Normal	Increased	Increased	Decreased
Cardio - Respiratory Fitness	Normal	Increased	Mild Impairment?	Severe Impairment?

Individuals with similar body mass index (BMI) can present a different body composition resulting in different cardiac function and cardiorespiratory fitness.

Obesity paradox in cardiovascular disease: where do we stand?

S Carbone, J M Canada, H E Billingsley, M S Siddiqui, A Elagizi, and C J Lavie

“Although BMI is a simple estimator of obesity, it cannot fully reflect muscle mass and body fat”





...durante...

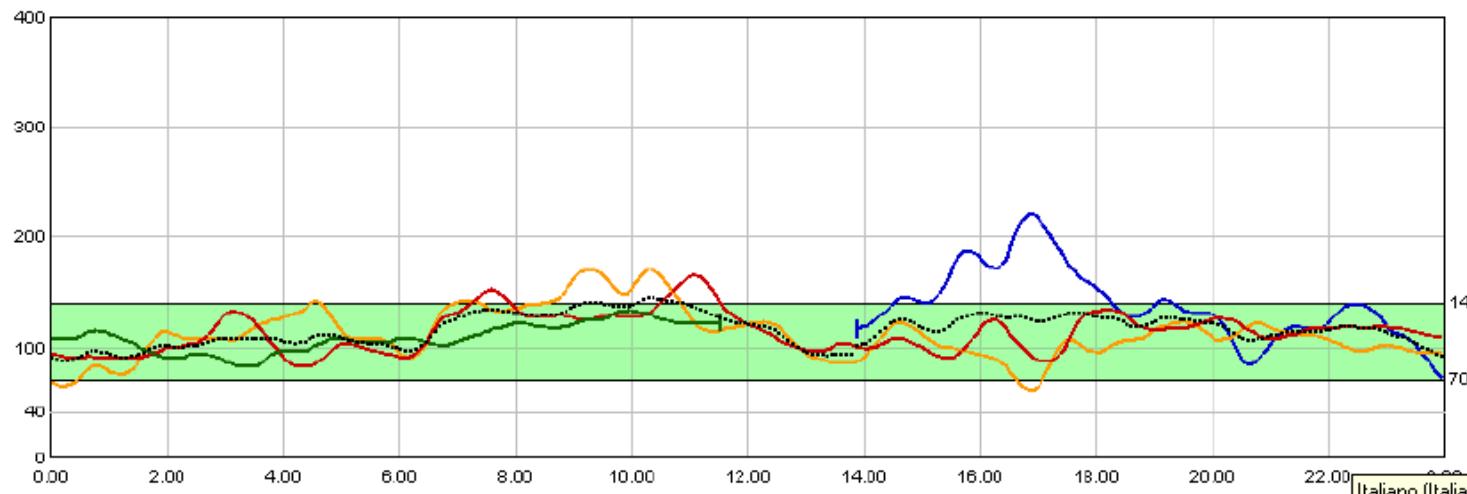


MANAGEMENT DEL PAZIENTE DIABETICO

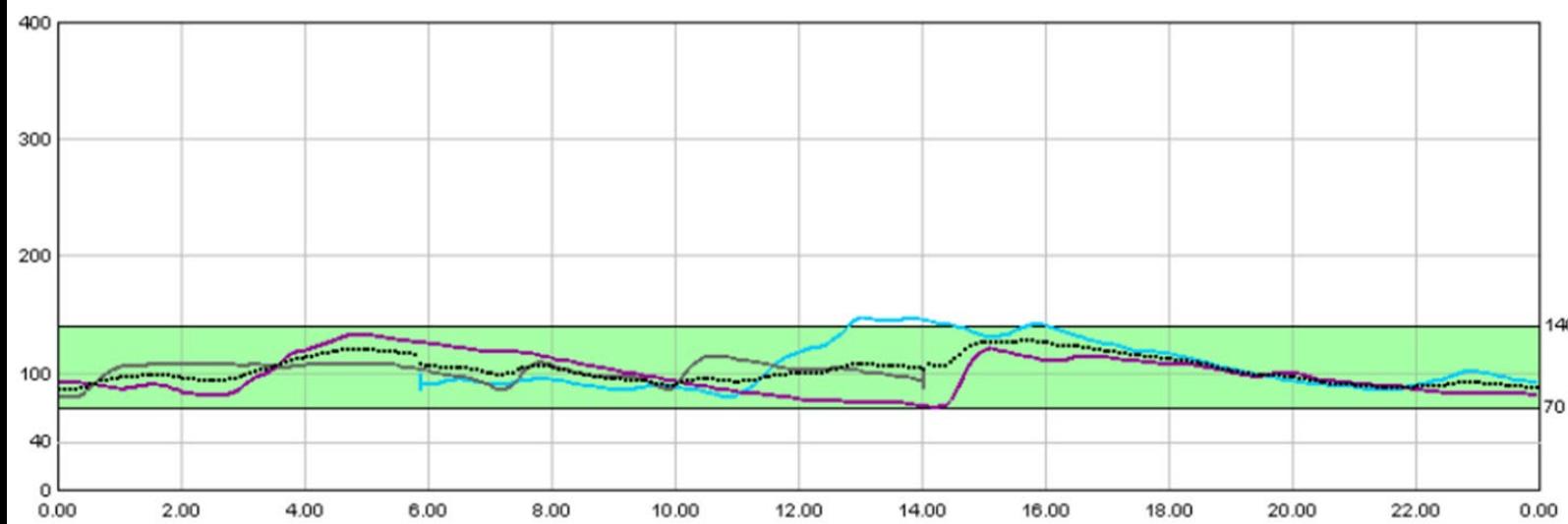
- Blood glucose levels were significantly reduced by 48 hours after SG and RYGB, regardless of diabetes medication (oral, noninsulin injectables, or insulin)
- In immediate postoperative patients with type 2 diabetes (T2D), the use of all insulin secretagogues (sulfonylureas and meglitinides), sodium-glucose cotransporter-2 inhibitors, and thiazolidinediones should be discontinued and insulin doses adjusted (due to low calorie intake) to minimize the risk for hypoglycemia
- Subcutaneous insulin therapy, using a rapid-acting insulin analogue (insulin lispro, aspart, or glulisine) before meals and a basal long-acting insulin analogue (insulin glargine, detemir, or degludec) should be used to achieve glycemic targets (140 to 180 mg/dL) in hospitalized patients not in intensive care

Sensor Data (mg/dL)

Fri 14-Dec Sat 15-Dec Sun 16-Dec Mon 17-Dec Tue 18-Dec Wed 19-Dec Thu 20-Dec Average



Fri 14-Dec Sat 15-Dec Sun 16-Dec Mon 17-Dec Tue 18-Dec Wed 19-Dec Thu 20-Dec Average

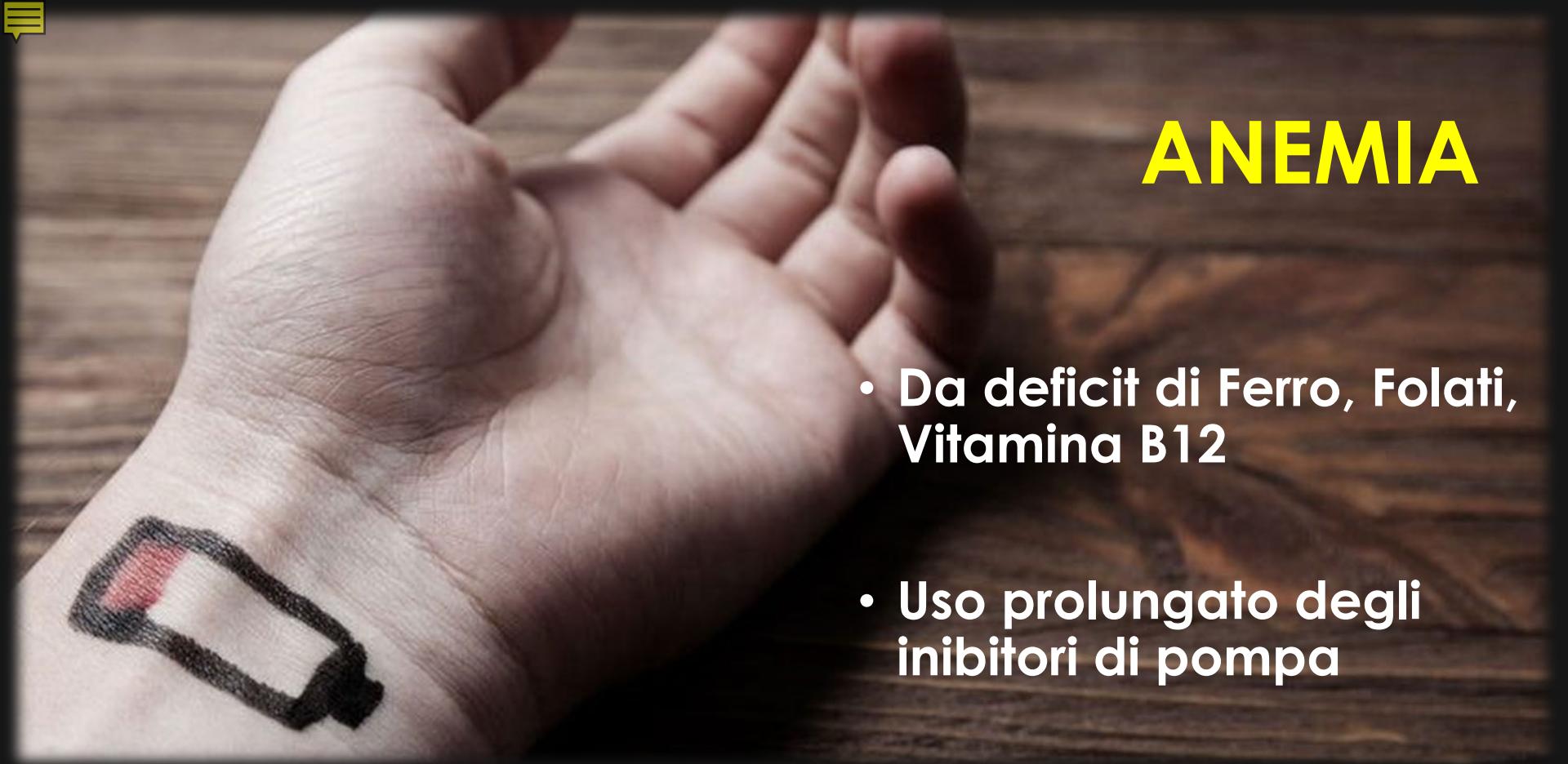


HOW CAN CARE BE OPTIMIZED DURING AND WITHIN 5 DAYS OF A BARIATRIC PROCEDURE?

- Postsurgery diet progression
- A minimal protein intake of 60 g/d and up to 1.5 g/kg ideal body weight per day should be adequate
- Patients with, or at risk for, demonstrable micronutrient insufficiencies or deficiencies **must be treated** with the respective micronutrient, and then adjusted based on recommendations for the late post-procedure period



...Dopo



ANEMIA

- Da deficit di Ferro, Folati, Vitamina B12
- Uso prolungato degli inibitori di pompa

NFPA:

- *sindrome della bocca che brucia*
- *subittero, stanchezza, intorpidimento e formicolio alle estremità*
- *neuropatia, atassia dell'andatura, demenza, psicosi*
- *Modifiche dell'incarnato, alterazioni della struttura delle unghie e dei capelli*

....ma attenzione alle cause nascoste!!!

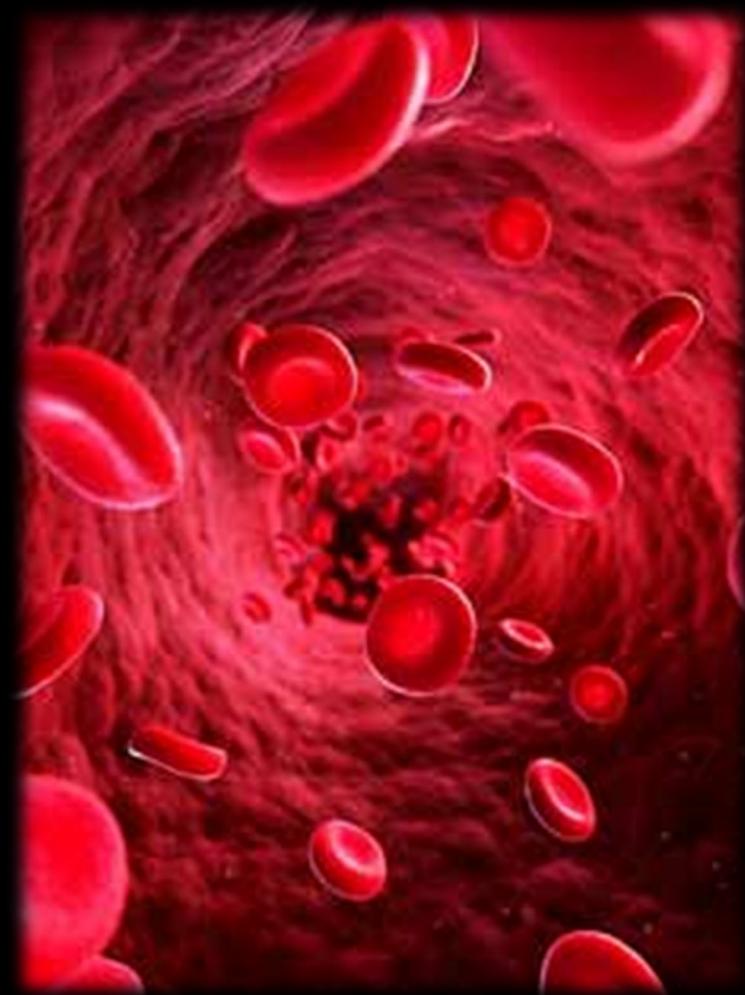
IRON

Iron deficiency and anemia are the most commonly reported nutritional complications following bariatric surgery.

In the recent ASMBS CPG, iron deficiency was as high as 45% of patients with obesity prior to bariatric surgery and therefore justifies a pre-operative aggressive case-finding approach.

Although most multivitamin preparations contain iron, such supplementation has been demonstrated not to prevent iron deficiency.

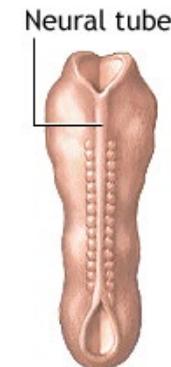
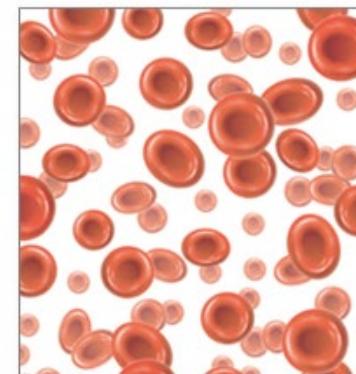
Menstruating women, and all patients undergoing malabsorptive procedures should be prescribed extra iron supplementation (50-100 mg ferrous sulphate daily).



FOLATE – B9

- Folate deficiency could be an alternative cause to anaemia.
- Folate is typically absorbed in the proximal segment of the intestine; after surgery it can be absorbed along the **entire small intestine** through adaptive mechanisms.
- Folate is essential to prevent neural tube defects in infants: pregnancy demands increase the risk for folate deficiency, so further supplementation may be necessary.
- In the recent ASMBS CPG, folate deficiency was found in as many as 45% of patients with obesity **prior to bariatric surgery**.

Folic acid is necessary for red blood cell production and neural tube formation

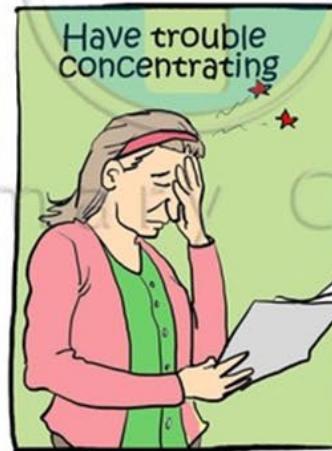
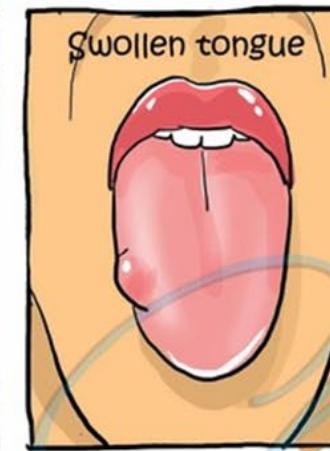


ADAM.

Folate deficiency is treated with **1000 mg/d**. Supplementation doses >1000 mg/d are not recommended due to the potential for disguising B12 deficiency.

A daily dose of 1 mg has been found to prevent deficiency

FOLIC ACID DEFICIENCY



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Deficiency symptoms include megaloblastic anemia, thrombocytopenia, leucopenia, glossitis, and elevated homocysteine levels



[Obesity Surgery](#)

October 2017, Volume 27, Issue 10, pp 2684–2687 | [Cite as](#)

More than a Case Report? Should Wernicke Encephalopathy After Sleeve Gastrectomy be a Concern?

[Obes Relat Dis.](#) 2018 Jul;14(7):943-950.

Prevalence and predictors of postoperative thiamine deficiency after vertical sleeve gastrectomy.

Tang L¹, Alsulaim HA², Canner JK³, Prokopowicz GP⁴, Steele KE⁵.

...CONCLUSIONS:

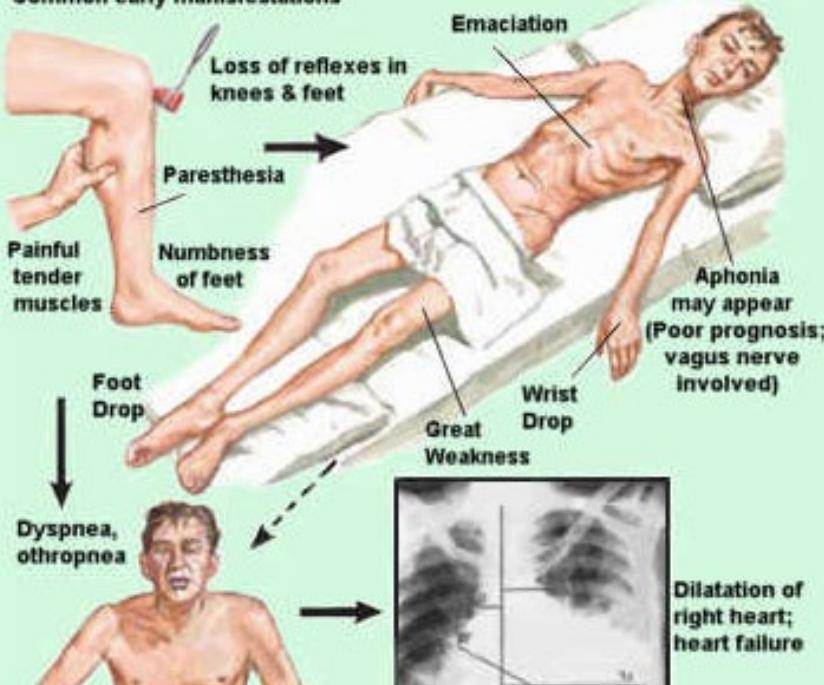
We found an alarmingly high prevalence of thiamine deficiency in postoperative SG patients.

This disorder may have serious consequences including **Wernicke encephalopathy**

THIAMINE – B1

THIAMINE DEFICIENCY (Beriberi)

Common early manifestations



Usually, multivitamin supplement prevents deficiency .
For severe cases of thiamin deficiency,
patients should be treated with
500 mg/d of intravenous (IV)
thiamin for 3–6 days.

- Since thiamin is not stored in large amounts in the body, levels can drop quickly in the presence of persistent vomiting, leading to thiamin deficiency in as short as 2 weeks.
- Thiamin deficiency after RYGB surgery can occur in up to 49% of patients
- Most common causes are persistent vomiting, inadequate dietary intake, and rapid weight loss.
- Thiamin deficiency mainly affects the central nervous system, leading to beriberi and Wernicke encephalopathy (WE), which can develop into Wernicke-Korsakoff syndrome (WKS).

Early signs/symptoms:

- *Dry beriberi (without edema):* brisk tendon reflexes, peripheral neuropathy and/or polyneuritis (with or without paresthesias), muscle weakness and/or pain of upper and lower extremities, gait ataxia, convulsions
- *Wet beriberi:* heart failure with high cardiac output, edema in the lower extremities, tachycardia or bradycardia, lactic acidosis, dyspnea, heart hypertrophy and dilation (particularly of the right ventricle), respiratory distress, systemic venous hypertension, bounding arterial pulsations
- *Other/gastroenterologic:* slow gastric emptying, nausea, vomiting, jejunal dilation or megacolon, constipation

Wernicke encephalopathy (WE)

- **Both patients with lower body weight, and female patients are at greater risk for developing WE, and should guide clinicians in preventive thiamine therapy**
- The most profound characteristic of WE in the reviewed case descriptions was **ataxia** (84.7%, 100 cases).
- The second characteristic was an altered mental status (76.3%, 90 cases), presenting itself as delirium, **confusion**, and problems in alertness or cognition.
- The third characteristic was eye movement disorders (73.7%, 87 cases), such as **nystagmus** and ophthalmoplegia, resulting from extraocular muscle weakness.
- **The full triad was present in 54.2% (64 cases)**

Obesity Surgery (2018) 28:2060–2068
<https://doi.org/10.1007/s11695-018-3262-4>

REVIEW ARTICLE



Preventing Wernicke Encephalopathy After Bariatric Surgery

Erik Oudman^{1,2} • Jan W. Wijnia^{1,2} • Mirjam van Dam^{1,2} • Laser Ulas Biter³ • Albert Postma^{1,2}

AACE/TOS/ASMBS/OMA/ASA 2019 Guidelines

WERNICKE-KORSAKOFF SYNDROME

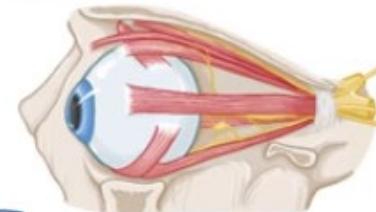
* SPECTRUM of DISORDERS

WERNICKE'S ENCELOPATHY → KORSAKOFF SYNDROME

WERNICKE'S ENCEPHALOPATHY

* OPHTHALMOPLEGIA

~ WEAKNESS or PARALYSIS of the EYE MUSCLES



* ATAXIA or UNSTEADY GAIT

* CHANGES in MENTAL STATE

~ CONFUSION
~ APATHY
~ DIFFICULTY CONCENTRATING

* UNTREATED → COMA & DEATH



KORSAKOFF SYNDROME

* TARGETS the LIMBIC SYSTEM

* SEVERE MEMORY IMPAIRMENT

~ ANTEROGRADE AMNESIA

↳ INABILITY to CREATE NEW MEMORIES

~ RETROGRADE AMNESIA

↳ INABILITY to RECALL PREVIOUS MEMORIES



* CONFABULATION

~ CREATES STORIES to FILL the GAPS in their MEMORY



DUMPING SYNDROME ED IPOGLICEMIA

Prevalence of DS after RYGB is reported to be up to 75%, and after SG up to 45%. Even though bothersome at least, DS is seen not seen as complication but rather as desirable feature by a few surgeons.



Hyperinsulinemic hypoglycemia after RYGB may lead to a potentially life-threatening deficiency of glucose in the central nervous system.

Nesidioblastosis is endogenous hyperinsulinemic hypoglycemia attributable to pancreatic β -cell hypertrophy and hyperfunction.

Physicians should be aware of this complication to ensure timely and effective treatment of post-RYGB patients, who present to them with hypoglycemic symptoms.

Prevalence of Dumping Syndrome After Laparoscopic Sleeve Gastrectomy and Comparison with Laparoscopic Roux-en-Y Gastric Bypass. *Obes Surg*. 2019 Jan 11.

Recognition and management of hyperinsulinemic hypoglycemia after bariatric surgery. *Obes Res Clin Pract*. 2016; 10(1): 1-14.

EARLY AND LATE DS

- Early DS usually occurs 30 to 60 min postprandially, and it can last for 60 min: this results in cardiovascular symptoms and the release of gastrointestinal and pancreatic hormones. Symptoms include abdominal pain, diarrhea, nausea, dizziness, flushing, palpitations, tachycardia, and hypotension to syncope.
- Late DS appears 1–3 h after a meal and is related to reactive hypoglycemia, which results at least partially from an exaggerated insulin and glucagon-like peptide-1 release postprandially
- The first line of treatment is to introduce dietary measures: avoidance of refined carbohydrates; increased intakes of protein, fiber, and complex carbohydrates; and separation between liquids
- The use of somatostatin or acarbose to relieve symptoms should also be considered



PATIENTS' MONITORING

- To avoid such complications after bariatric surgery, understanding of the physiological and metabolic changes occurring after bariatric surgery **is necessary**
- Patients require **lifelong** vitamin and mineral supplementation regimens following bariatric surgery.
- Routine biochemical monitoring for nutrition status is standard practice in a **comprehensive bariatric center**.

American Society for Metabolic and Bariatric Surgery Integrated Health
Nutritional Guidelines for the Surgical Weight Loss Patient 2016
Update: Micronutrients

MICRONUTRIENTS

Table 9
Postprocedure Checklist^a

Checklist Item		LAGB	SG	RYGB	BPD/DS
<i>Early postoperative care</i>					
✓	monitored telemetry at least 24 h if high risk for MI	✓	✓	✓	✓
✓	protocol-derived staged meal progression supervised by RD	✓	✓	✓	✓
✓	healthy eating education by RD	✓	✓	✓	✓
✓	multivitamin plus minerals (# tablets for minimal requirement)	1	2	2	2
✓	elemental calcium (as calcium citrate)	1,200-1,500 mg/d	1,200-1,500 mg/d	1,200-1,500 mg/d	1,800-2,400 mg/d
✓	vitamin D, at least 3,000 units/d, titrate to >30 ng/mL	✓	✓	✓	✓
✓	vitamin B ₁₂ as needed for normal range levels	✓	✓	✓	✓
✓	maintain adequate hydration (usually >1.5 L/d PO)	✓	✓	✓	✓
✓	monitor blood glucose with diabetes or hypoglycemic symptoms	✓	✓	✓	✓
✓	pulmonary toilet, spirometry, DVT prophylaxis	✓	✓	✓	✓
✓	if unstable, consider PE, IL	PE	PE	PE/IL	PE/IL
✓	if rhabdomyolysis suspected, check CPK	✓	✓	✓	✓

Follow-up

✓	visits: initial, interval until stable, once stable (months)	1, 1-2, 12	1, 3, 6, 12	1, 3, 6-12	1, 3, 6
✓	monitor progress with weight loss and evidence of complications each visit	✓	✓	✓	✓
✓	SMA-21, CBC/plt with each visit (and iron at baseline and after as needed)	✓	✓	✓	✓
✓	avoid nonsteroidal anti-inflammatory drugs	✓	✓	✓	✓
✓	adjust postoperative medications	✓	✓	✓	✓
✓	consider gout and gallstone prophylaxis in appropriate patients	✓	✓	✓	✓
✓	need for antihypertensive therapy with each visit	✓	✓	✓	✓
✓	lipid evaluation every 6-12 months based on risk and therapy	✓	✓	✓	✓
✓	monitor adherence with physical activity recommendations	✓	✓	✓	✓
✓	evaluate need for support groups	✓	✓	✓	✓
✓	bone density (DXA) at 2 years	✓	✓	✓	✓
✓	24-h urinary calcium excretion at 6 months and then annually ^b	x	x	x	✓
✓	B ₁₂ (annually; MMA and HCy optional; then q 3-6 months if supplemented)	✓	✓	✓	✓
✓	folic acid (RBC folic acid optional), iron studies, 25-vitamin D, iPTH	x	x	✓	✓
✓	vitamin A (initially and q 6-12 months thereafter)	x	x	optional	✓
✓	copper, zinc, selenium evaluation with specific findings	x	x	✓	✓
✓	thiamine evaluation with specific findings	✓	✓	✓	✓
✓	consider eventual body contouring surgery	✓	✓	✓	✓
✓	lifestyle medicine evaluation: healthy eating index; cardiovascular fitness; strength training; sleep hygiene (duration and quality); mood and happiness; alcohol use; substance abuse; community engagement	✓	✓	✓	✓
✓	hemoglobin A1c, TSH evaluation in long-term follow-up	✓	✓	✓	✓

TAKE HOME MESSAGES

- MONITORAGGIO PREOPERATORIO
- SUPPLEMENTAZIONE
- GESTIONE DELL'IMMEDIATO POSTOPERATORIO
- ADEGUAMENTO **TERAPEUTICO ALLA DIMISSIONE**
(RIPRESA DELLA TERAPIA DOMICILIARE SI O NO???)
- ADEGUATA COMPRENSIONE E COMPLIANCE ALLA PROGRESSIONE DIETETICA E ALL'ASSUNZIONE DELLE INTEGRAZIONI - VALUTAZIONE DEGLI INTAKE e dei sintomi
- EFFICACE PROGRAMMAZIONE DEL FOLLOW UP
- ATTENZIONE AL PAZIENTE: a parità di intervento il rischio nutrizionale varia incredibilmente da paziente a paziente

Adherence to follow-up is associated with fewer postoperative adverse events, greater excess body weight loss, and fewer comorbidities.

However, several studies have found that compliance with follow-up after bariatric surgeries **is low**.

Digital communication methods, such as social media, telephone consultations, and online educational programs, should be used to increase engagement with patients and to minimize barriers

It is recommended that the postoperative follow-up be held by a multidisciplinary medical team

...The importance of a multidisciplinary team



COMPLICANZE ACUTE NEL FOLLOW-UP DEL PAZIENTE BARIATRICO

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Tesoriere della S.I.C.OB.



Società Italiana di Chirurgia dell'OBesità
e delle malattie metaboliche

COMPLICANZE

- Complicanze precoci (< 30 giorni)

- Esordio acuto (in Reparto)
- in Pronto Soccorso

- Complicanze tardive (> 30 giorni)

- Esordio acuto o cronico
- Chirurgiche o metaboliche



Società Italiana di Chirurgia dell'OBesità
e delle malattie metaboliche

TOPICS

- Complicanze acute da pallone intragastrico
- Complicanze acute da banding
- Emorragia
 - Intra-peritoneale
 - Endo-luminale
- Ulcera gastrica/duodenale
- Fistola
 - Trancia gastrica
 - Anastomotica
- Stenosi
 - Gastrica
 - Anastomotica
- Ernia interna
- Complicanze di parete
- Embolia polmonare



Società Italiana di Chirurgia dell'OBesità
e delle malattie metaboliche

FATTORI DI RISCHIO NOTI



ORIGINAL ARTICLE

pISSN 2288-6575 • eISSN 2288-6796
<https://doi.org/10.4174/astr.2018.95.2.100>
Annals of Surgical Treatment and Research

Risk factors for early postoperative complications after bariatric surgery

Farah Husain¹, In Ho Jeong^{1,2}, Donn Spight¹, Bruce Wolfe¹, Samer G Mattar¹

¹Department of Surgery, Oregon Health and Science University, Portland, OR, USA

²Department of Surgery, Jeju National University School of Medicine, Jeju, Korea

Results: Independent predictors of severe complication after these procedures included male gender, open and revisional surgery, hypertension, and hypoalbuminemia. Hypoalbuminemia had significant associations with occurrence of deep surgical site infection and leak. Open surgery had significant associations with occurrence of superficial and deep surgical site infection and respiratory complications. Independent predictors of severe complication after laparoscopic primary RYGB included previous abdominal surgery. Previous abdominal surgery had significant associations with deep surgical site infection and leak.

Conclusion: Recognition and optimization of these risk factors would be valuable in operative risk prediction before bariatric surgery.

[Ann Surg Treat Res 2018;95(2):100-110]

LINEE GUIDA SICOB 2016

S.I.C.O.B.



E.57 Il follow-up del paziente sottoposto a chirurgia bariatrica deve essere programmato nel lungo termine (idealmente a vita) e affidato a un'équipe interdisciplinare (LIVELLO DI EVIDENZA: 3; GRADO DI RACCOMANDAZIONE: B). Esso si pone come obiettivo non solo di monitorare i risultati in termini di calo ponderale, qualità della vita e di controllo delle eventuali patologie associate, ma anche di prevenire le complicatezze chirurgiche e non chirurgiche, ed eventualmente di giungere a una loro precoce diagnosi, al fine di consentirne un tempestivo trattamento. Il raggiungimento degli obiettivi che il follow-up si prefigge necessita quindi l'adesione convinta del paziente e l'adozione di una serie di misure che coinvolgono, spesso in comunanza d'intenti, il chirurgo, il dietologo, lo psicologo e lo psichiatra.



Società Italiana di Chirurgia dell'OBesità
e delle malattie metaboliche

PROBLEMI DIAGNOSTICI

Eur J Trauma Emerg Surg (2016) 42:571–584
DOI 10.1007/s00068-015-0621-x



REVIEW ARTICLE

Essential bariatric emergencies for the acute care surgeon

B. Wernick¹ · M. Jansen¹ · S. Noria² · S. P. Stawicki¹ · M. El Chaar¹

- Scarsa conoscenza
 - Medico di PS
 - Radiologo
 - Chirurgo (!)
- Riferimento al Centro bariatrico



Società Italiana di Chirurgia dell'OBesità
e delle malattie metaboliche

IMPORTANZA DELLA DIAGNOSI

Obesity Surgery (2018) 28:2923–2931
<https://doi.org/10.1007/s11695-018-3334-5>



REVIEW ARTICLE



Imaging after Bariatric Surgery: When Interpretation Is a Challenge, from Normal to Abnormal

Evelyn Astrid Dorado Alba¹ • Carlos A. García² • Laura M. Ospina² • Hernán E. Munevar³

Conclusion

Bariatric surgery has proven to be an effective approach in the treatment of morbid obesity and its associated comorbidities, but, although low, it carries some risk of secondary complications, described in < 0.9% of the patients. Contrasted CT scan and fluoroscopic studies have shown a high sensitivity in the early and late diagnosis of complications, but in order to be

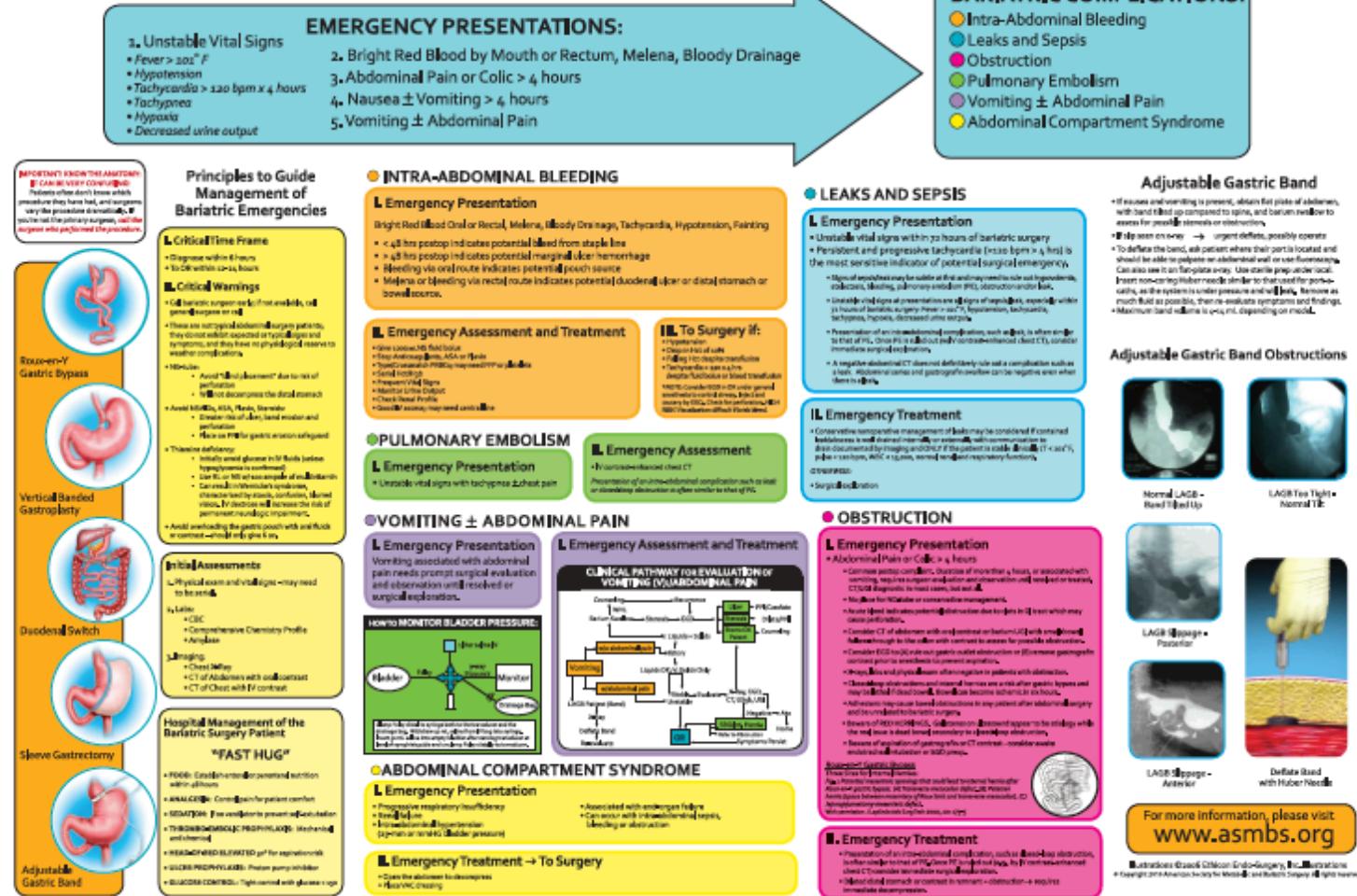
I N A R
O N D A

able to appropriately identify these complications, it is important to be familiar with the normal or expected radiological findings. Some images imply an interpretation challenge for surgeons and radiologists, most of the time because they are uncommon findings that require a high index of suspicion and knowledge of the surgical anatomy in order to achieve an accurate diagnosis.

FLOW CHART IN PRONTO SOCCORSO



Clinical Pearls for Emergency Care of the Bariatric Surgery Patient



SOCIETÀ ITALIANA DI CHIRURGIA DELL'OBESITÀ
Un problema in più... Intervento bariatrico non sempre noto al paziente stesso!

CLINICA

- Sintomatologia respiratoria spiccata (dd con tromboembolia)
- Polipnea – tachicardia – sudorazione profusa
- Vomito
- Esami ematochimici
 - Emocromo poco dirimente
 - Alterazione coagulazione precoce
 - PCR elevata
- Alvo spesso ingannevole (falsamente aperto)

COMPLICANZE ACUTE

Letteratura

- Molti dati sul management dei pazienti complicati (gestione da parte di medici e chirurghi non bariatrici)
- Fistola: scarsa evidenza sull'approccio migliore
- Reinterventi precoci: più spesso revisione dell'intervento bariatrico

WEBINAR
SECONDA
STAGIONE

Chousleb E, Management of post-bariatric surgery emergencies, J Gastrointest Surg 2017; 21: 1946-53

Contival N, Guiding the non-bariatric surgeon through complications of bariatric surgery. J Visc Surg. 2018; 155: 27-40

S.I.C.OB Società Italiana di Chirurgia dell'Obesità
Peterson RM, Managing complications of bariatric surgery. Adv Surg 2019. 53: 55-68

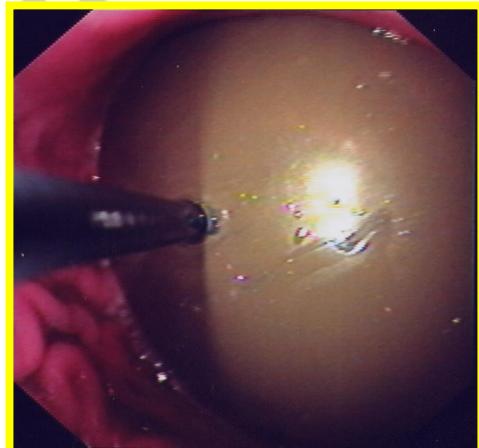
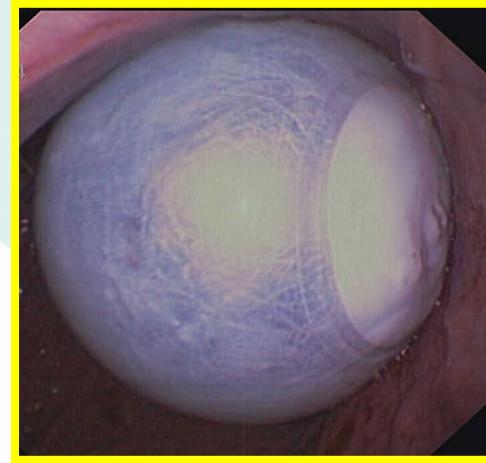
COMPLICANZE ACUTE DA PALLONE INTRAGASTRICO

- Intolleranza del pallone
- Dilatazione gastrica acuta (ostruzione dell'outlet)

Esordio acuto:
vomito incoercibile
disidratazione
ipokaliemia

Rimozione endoscopica urgente, per evitare complicanze metaboliche e cardiovascolari

- Occlusione
 - Individuazione del dispositivo in addome
 - Valutazione chirurgica in caso di occlusione intestinale



COMPLICANZE ACUTE POST-BANDING

Pouch Dilatation Acute dilation results from overfilling of the band, provoking excessive stomal narrowing, which could cause the stomach to slip up through the band. Patients present with dysphagia, recurrent vomiting, and nausea. It is recommended to deflate and calibrate the band to avoid complications such as erosion or slippage [7, 35].

Chronic dilatation occurs in up to 3 to 8% of patients and is seen under normal stoma width; it is chronic overload given by high oral intake by the patient that causes the dilatation. The best way to document this is through a barium study [7, 35, 36].

Distal Band Slippage It represents 13% of the complications of the banding, and it is the result of multiple factors, including bad positioning of the band, herniation of the posterior wall of the stomach, and overinflation of the band. Patients will present with symptoms of insufficient weight loss, reflux, and vomiting. On abdominal imaging, there is increased separation between the band and the medial aspect of the left hemidiaphragm; this finding constitutes a diagnostic criteria; also, on barium studies, the herniation of the fundus, body, or antrum of the stomach through the band is visualized, which can sometimes be associated with the development of gastric volvulus. The management of this complication is based on the removal of the band or its relocation [7, 34].

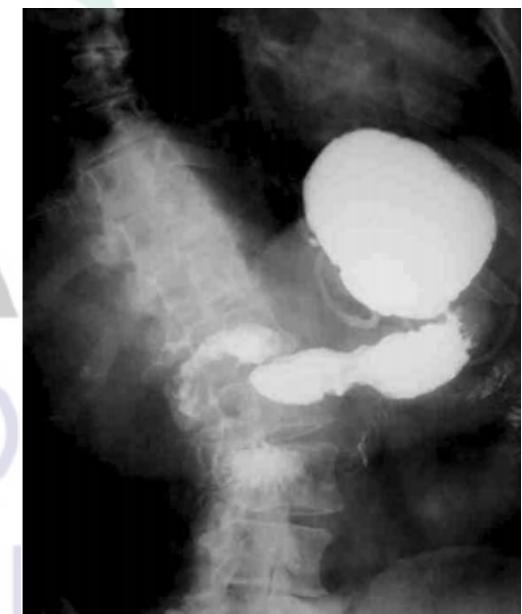
Perforation Acute perforation is a complication that occurs in >1% of the cases; it is the result of trauma to the gastric wall during the placement of the band [34].

Intraluminal Band Erosion It is a late complication that can occur in 2% of cases; it is caused by high pressures in the inflated band which leads to erosion of the gastric tissue. When penetrating completely, it can migrate to the distal stomach or duodenum and cause obstructive symptoms [7, 27, 35].

- Raramente precoci
- Reintervento necessario nel 90% delle complicate precoci da band
(riposizionamento/rimozione)

COMPLICANZE ACUTE POST-BANDING

- INTOLLERANZA DEL BAND (VOMITO INCOERCIBILE)
 - Alterata motilità esofagea
- DILATAZIONE ACUTA DELLA TASCA (SCIVOLAMENTO)
- MIGRAZIONE PRECOCE
 - Errore tecnico?
 - Danno parete gastrica posteriore ?



COMPLICANZE ACUTE POST-BANDING

OBES SURG (2010) 20:1333–1339
DOI 10.1007/s11695-010-0225-9

CLINICAL REPORT

Laparoscopic Gastric Band Migration: Role of Environmental Factors in the Experience of a Single Team in Three Operating Rooms

Pietro Forestieri · Vincenzo Pilone ·
Salvatore Tramontano · Antonio Formato ·
Angela Monda · Emanuela Esposito



Importanza del **follow-up** costante, fin dal post-operatorio,
per individuare precocemente segni di sospetto

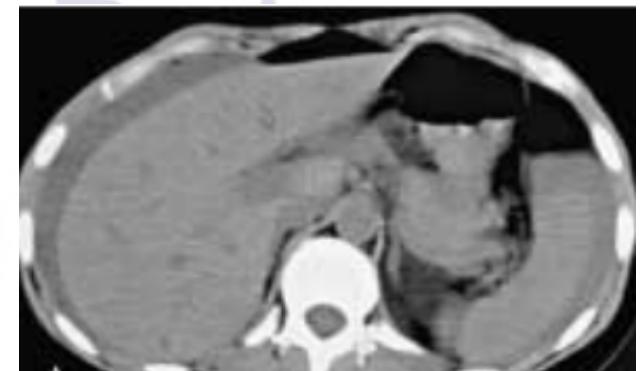
Clinico

Endoscopico

Nutrizionale

EMORRAGIA

- Trattamento conservativo efficace in oltre il 70% dei casi
- Clinica quasi sempre sfumata
 - sostegno da massa circolante e vasocostrizione periferica, fino allo shock conclamato
- Possibile fattore di rischio per tromboembolia
 - Attivazione processi coagulativi
- Fattore di rischio riconosciuto per fistola
 - Ematoma associato
 - Alterazione vascolarizzazione



Jossart GH. Complications of sleeve gastrectomy: bleeding and prevention Surg Laparosc Endosc Percutan Tech. 2010 ; 20: 146-7
Cai JX, Endoscopic Management of Bariatric Surgery Complications Surg Laparosc Endosc Percutan Tech 2016; 26: 93-101

EMORRAGIA

Sleeve gastrectomy

- Causa principale: vasi brevi
- Considerare sempre sanguinamento vasi pancreatici posteriori
- Lesione splenica riportata anche in lavori recenti
- Reintervento: non evidente chiara fonte di sanguinamento fino al 30% dei casi

Cai JX, Endoscopic Management of Bariatric Surgery Complications Surg Laparosc Endosc Percutan Tech 2016; 26: 93-101

Monkhouse SJ, Complications of bariatric surgery: presentation and emergency management--a review. Ann R Coll Surg Engl. 2009 May;91(4):280-6

EMORRAGIA GBP – MGB/OAGB - DBP

- 70% dei sanguinamenti: endoluminale
- Per GBP, considerare sempre lo stomaco escluso (!)



EMORRAGIA

Timing del trattamento

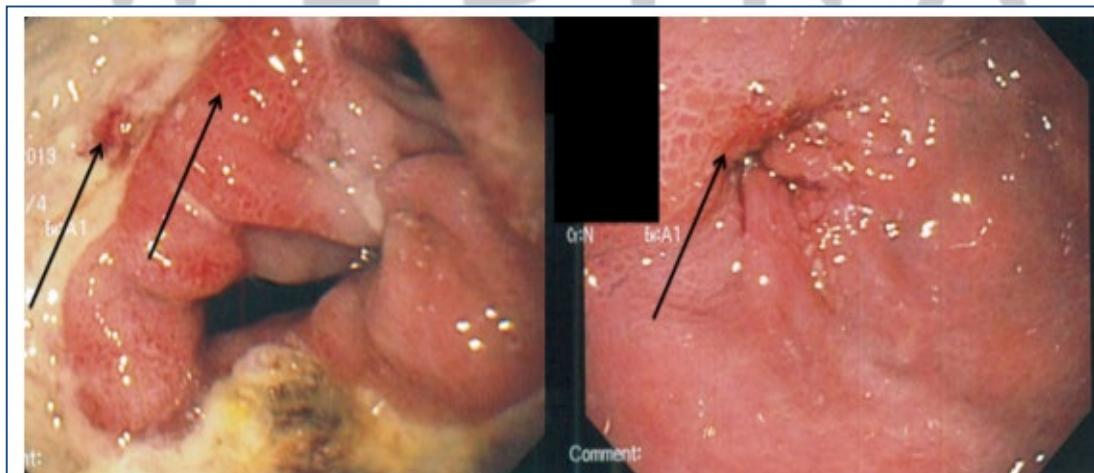
- Stabilità emodinamica
- Risposta ad emotrasfusioni
- Emoperitoneo
- Look endoscopico
(da proporre con cautela, in presenza di anastomosi)

Montravers P. Diagnosis and management of the postoperative surgical and medical complications of bariatric surgery.

ULCERA PEPTICA

Sleeve gastrectomy

- Riduzione significativa nei report più recenti
- Raramente precoce
- Considerare sempre studio endoscopico preoperatorio



Mocanu V. The Effect of *Helicobacter pylori* on Postoperative Outcomes in Patients Undergoing Bariatric Surgery: a Systematic Review and Meta-analysis. *Obes Surg* 2018; 28(2):567-573.

ULCERA PEPTICA GBP – MGB/OAGB - DBP

- Miglioramento con terapia precoce (PPI per 30-60 giorni)
- GBP: problema dello stomaco escluso
(accurato studio preoperatorio ed eradicazione HP)
- DBP: maggior rischio di perforazione
- DBP: considerare antro ritenuto (!)

Ghosh SK, A Narrative of Intraoperative Staple Line Leaks and Bleeds During Bariatric Surgery. *Obes Surg* 2016; 26:1601-6.

Ferreira LE, Management of acute postoperative hemorrhage in the bariatric patient. *Gastrointest Endosc Clin N Am* 2011; 21(2):287-94

STENOSI

- SLG: 1-5% (++): primi 6 mesi)
- GBP: 3- 27% (++): primi 3 mesi)
- MGB/OAGB: 0.5 – 2% (++): primo mese)
- **Trattamento endoscopico**
per stenosi lievi (>10 mm) o moderate (>8.5 mm)
- **Tentativo endoscopico su guida fluoroscopica**
per stenosi serrate (<8.5 mm), in 2-3 sedute (con rischi di perforazione fino al 3%)

Silecchia G, Complications of staple line and anastomoses following laparoscopic bariatric surgery

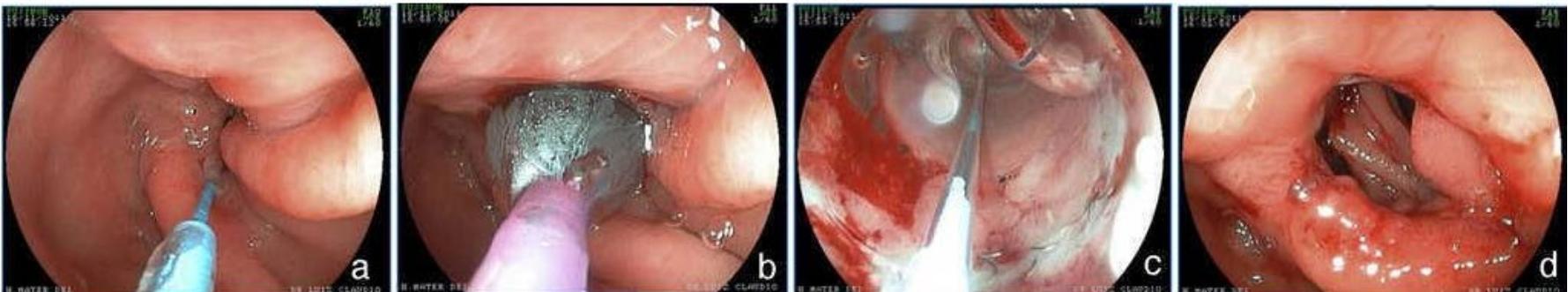
Società Italiana di Chirurgia dell'Obesità
e delle malattie metaboliche



Ann Gastroenterol. 2018 ;31(1):56-64

STENOSI

Trattamento endoscopico



Risultati della dilatazione non sempre prevedibili

SECONDA
STAGIONE



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FISTOLA

- LSG: 1 - 8%
- GBP: 2 - 7% (++: gastrodigiuno-anastomosi)
- MGB/OAGB: 1 - 6%

Esordio precoce meno impegnativo dal punto di vista **diagnostico**, rispetto a quello tardivo (fistole croniche)

FISTOLA

Sleeve gastrectomy

- Considerare sempre un sanguinamento locale all'origine delle fistole precoci
- Evoluzione drammatica del trattamento non chirurgico (device di nuova generazione)

Gagner M, Comparison of laparoscopic sleeve gastrectomy leak rates in four staple-line reinforcement options: a systematic review. SOARD 2014 ;10(4):713-23.

Nedelcu M, Outcome of leaks after sleeve gastrectomy based on a new algorithm addressing leak size and gastric stenosis. Obes Surg 2015; 25(3):559-63.

COMPLESSITA' DELLA DIAGNOSI

Obesity Surgery (2018) 28:2923–2931
https://doi.org/10.1007/s11695-018-3334-5



REVIEW ARTICLE

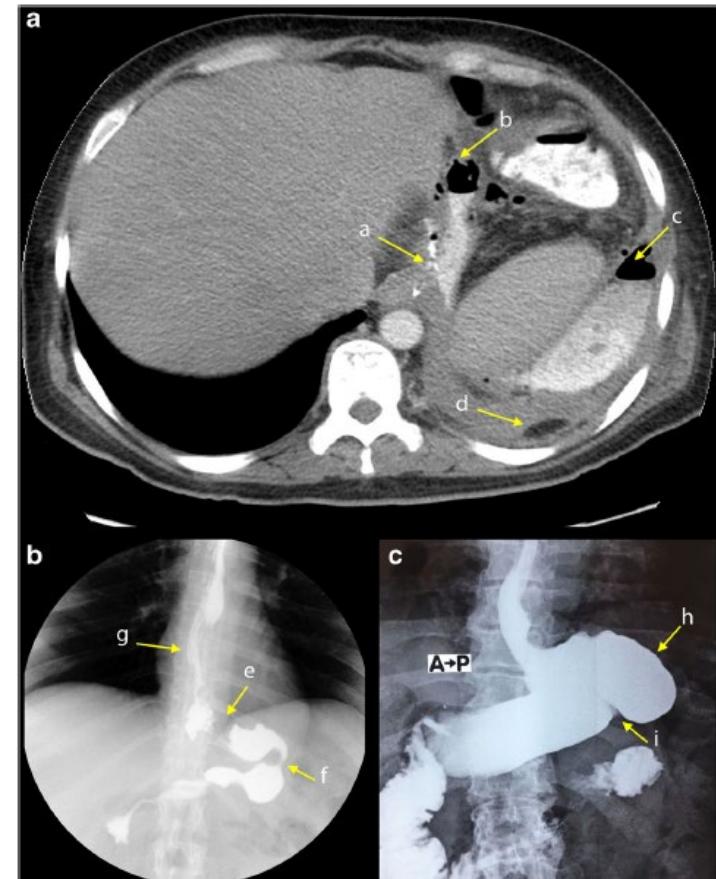


Imaging after Bariatric Surgery: When Interpretation Is a Challenge, from Normal to Abnormal

Evelyn Astrid Dorado Alban¹ · Carlos A. García² · Laura M. Ospina² · Hernán E. Munevar³

medium to left subdiaphragmatic collections [b and c]. Reactive pleural effusion and thickening [d]. (B) Study of upper digestive tract. Loss of tubular morphology of the gastric sleeve due to stenosis of the esophagogastric junction [e] and in the middle gastric third [f] due to torsion that conditions tertiary esophageal waves [g] by partial obstruction. (C) Opacification of the gastric sleeve, with fundus of approximately 50% of the gastric surface, which conditions a decline of the end of the gastric fundus [h] and fold [i] that predispose to torsion

Fistola dopo LSG



FISTOLA GBP – MGB/OAGB - DBP

- Esordio precoce in genere associato a difetto di vascularizzazione dell'anastomosi
- Trattamento endoscopico oggi gold standard
- Chirurgia per casi selezionati:
 - mancata risposta a trattamento endoscopico
 - Instabilità emodinamica/peritonite
 - Drenaggio incompleto
 - Stenosi a valle

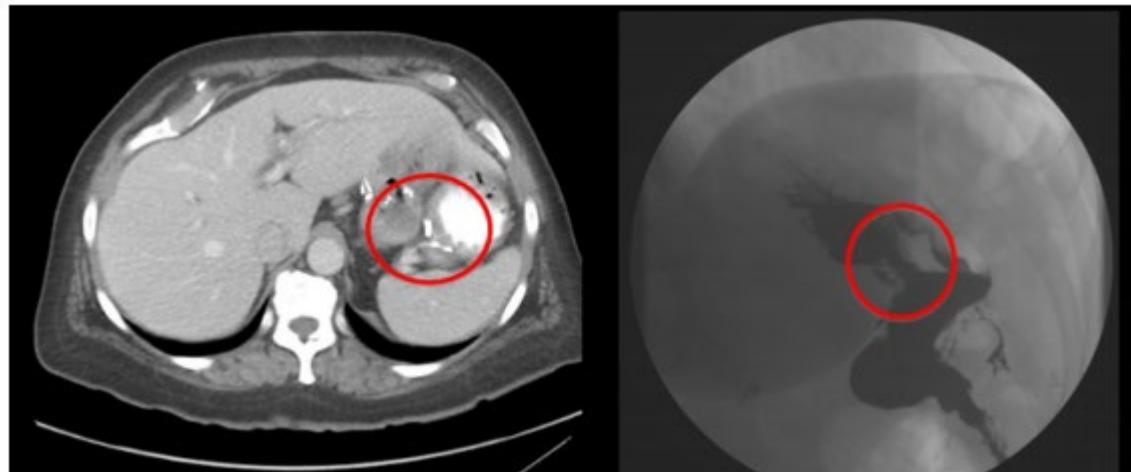
Abou Rached A, Gastric leaks post sleeve gastrectomy: review of its prevention and management World J Gastroenterol 2014.
14;20(38):13904-10.

Aurora AR, Sleeve gastrectomy and the risk of leak: a systematic analysis of 4,888 patients. Surg Endosc 2012 ;26(6):1509-15.

FISTOLA GBP – MGB/OAGB - DBP



Fistola gastro-gastrica dopo GBP: difficoltà diagnostiche



FISTOLA

Costi

OPZIONE 1. Fistola trattata con intervento chirurgico di riparazione nell'immediato post operatorio, lavaggio, drenaggio, IV antibiotici e alimentazione,
2 settimane degenza ospedaliera £ 14.543

OPZIONE 2. Fistola che non può essere riparata chirurgicamente, lavaggio, drenaggio, IV antibiotici e alimentazione, trattato con ripetuti stenting,
6 settimane degenza ospedaliera £ 35.639

OPZIONE 3. Fistola che non può essere riparata chirurgicamente, lavaggio, drenaggio, IV antibiotici e alimentazione, stent multipli, mancata guarigione, richiede bypass di salvataggio,
12 settimane degenza ospedaliera £ 68.980



Società Italiana di Chirurgia dell'OBesità
e delle malattie metaboliche

Ahmed A, British J of Surg 2013

FISTOLA OPZIONI PER RIDURRE I LEAK?



FISTOLA

Opzioni per ridurre i leak?

Staple Line/Anastomotic Reinforcement and Other Adjuncts: Do They Make a Difference?

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¹Department of Surgery, University of Arkansas for Medical Sciences, Little Rock, Arkansas

Clin Colon Rectal Surg 2014;27:156–161.

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(e-mail: jalaryea@uams.edu).

SECONDA
STAGIONE

Reale efficacia dei diversi device
ancora non confermata

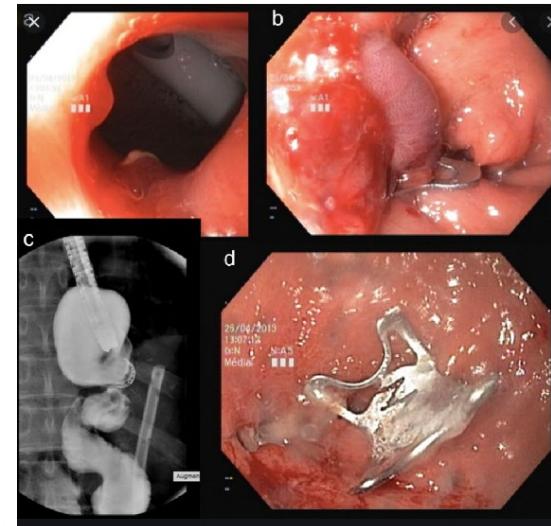


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FISTOLA

Trattamento endoscopico

- Combinazione di Argon plasma con brush da citologia
- Sutura endoscopica
- Clip/Ovesco
- Colla di fibrina
- Posizionamento di stent
- Gel piastrinico
- Cellule staminali



Iossa A, Leaks after laparoscopic sleeve gastrectomy: overview of pathogenesis and risk factors.

Langenbecks Arch Surg. 2016; 401(6):757-66.



Endoscopic management of leaks and fistulas after bariatric surgery: a systematic review and meta-analysis

Pawel Rogalski¹ · Agnieszka Swidnicka-Siergiejko¹ · Justyna Wasielica-Berger¹ · Damian Zienkiewicz¹.
Barbara Wieckowska² · Eugeniusz Wroblewski¹ · Andrzej Baniukiewicz¹ · Magdalena Rogalska-Plonska³.
Grzegorz Siergiejko⁴ · Andrzej Dabrowski¹ · Jaroslaw Daniluk¹

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- **40 studi**
- **493 pazienti**
- **Timing fistola: 1-803 giorni!**
- Considerare rischio di migrazione degli stent
- **Approcci multistep ideali**
- **Personalizzazione trattamento**

In summary, to the best of our knowledge, our meta-analysis and systematic review is currently the largest analysis of the efficacy and safety of endoscopic treatment of post-bariatric leaks and fistulas.

In conclusion, there is the most evidence of the effectiveness of self-expanding stents in the treatment of post-bariatric leaks and fistulas. However, despite the use of new stent designs, the frequency of stent migration remains high. Post-bariatric fistulas and leaks with an orifice size of up to 20 mm can also be successfully treated with clips, preferably OTSC. In turn, application of fibrin glue allows closing narrow fistulas. However, it may require multiple sessions to achieve leak closure. There is an urgent need for RCTs to assess the efficacy and safety of both individual as well as combined endoscopic methods in the treatment of post-bariatric leaks and fistulas.

Efficacy and Safety of Stents in the Treatment of Fistula After Bariatric Surgery: a Systematic Review and Meta-analysis

Ossamu Okazaki¹  · Wanderley M. Bernardo¹ · Vitor O. Brunaldi¹ · Cesar C. de Clemente Junior¹ · Maurício K. Minata¹ · Diogo T. H. de Moura¹ · Thiago F. de Souza¹ · Joseemberg Marins Campos² · Marco Aurélio Santo³ · Eduardo G. H. de Moura¹

- 24 studi
- 187 pazienti
- **Selezione del paziente fondamentale per ottenere elevati tassi di successo**

Conclusion

The results of this systematic review and meta-analysis indicate that, in appropriately selected patients, endoscopic treatment of fistulas after GS or RYGB via stent placement can be safe, with a low rate of severe adverse complications, and effective, with a high success rate of fistula closure.

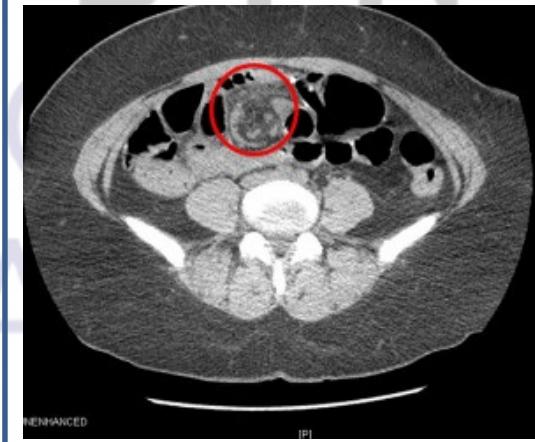
ERNIA INTERNA

- Diagnosi spesso tardiva (1% – 5.2% in letteratura)
- Quadro clinico sfumato e a pousses
- Come complicanza precoce, va sempre sospettata in caso di alvo irregolare e vomito ogni 24-48 ore (eccetto i quadri di occlusione franca)
- GBP: chiusura degli spazi tra i mesi evidenza *incontestabile* in letteratura

Abou Rached A, *Gastric leaks post sleeve gastrectomy: review of its prevention and management* World J Gastroenterol
2014. 14;20(38):13904-10.

Kagoma YK. Computed tomography of internal hernias following laparoscopic Roux-en-Y Gastric Bypass surgery. Semin Ultrasound CT MR. 2018; 39(2):145-150.

ERNIA INTERNA



Infarcimento emorragico
di ansa in ernia interna

IMPORTANZA DEI CONTROLLI

Timing

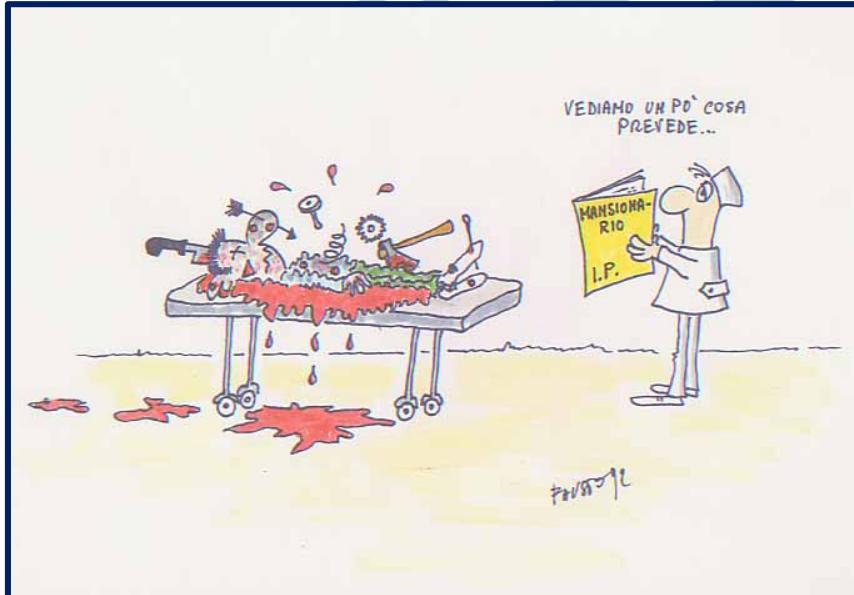
- Controlli ambulatoriali **nei primi 3 mesi** fondamentali per individuare precocemente complicanze precoci
- Valutazione non specialistica (medico di famiglia) o senza equipe multidisciplinare
associata a **diagnosi tardive e prognosi peggiore**



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CONCLUSIONI

E' necessario riconoscere precocemente il
PAZIENTE BARIATRICO
DA PRONTO SOCCORSO (complicanza in atto)
o
IN PRONTO SOCCORSO (non sempre riconoscibile)



alattie metaboliche