



Morbid Obesity & Bariatric Surgery

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Lecture outline

- Some Statistics
- Background issues
- Lap bariatric procedures
- Principles for Bariatric Emergencies
- Early and late complications



Magnitude of the problem Worldwide





Bariatric

Bariatric originated from the Greek root *baro* ("weight," as in barometer), and suffix *-iatrics* ("treatment," as in pediatrics).





WHO Classification of Obesity

| BMI | Classification |
|-----------|----------------|
| <18.5 | Underweight |
| 18.5-24.9 | Normal |
| 25-29.9 | Overweight |
| 30-34.9 | Obesity I |
| 35-39.9 | Obesity II |
| ≥ 40 | Obesity III |



Foresight report in 2007



- Obesity reduces life expectancy by 7 years.
- The UK has the fastest increase in the disease in Europe.
- Obesity cost the UK economy £7 billion and the NHS £2 billion per year.
- It is expected that obesity will cost the UK economy £45 billion and the NHS £6.5 billion in 2050
- Obesity is responsible for 30,000 deaths per year in England.





Some statistics

- Obesity in Jordan
 - 34% overweight adults
 - 50% overweight children

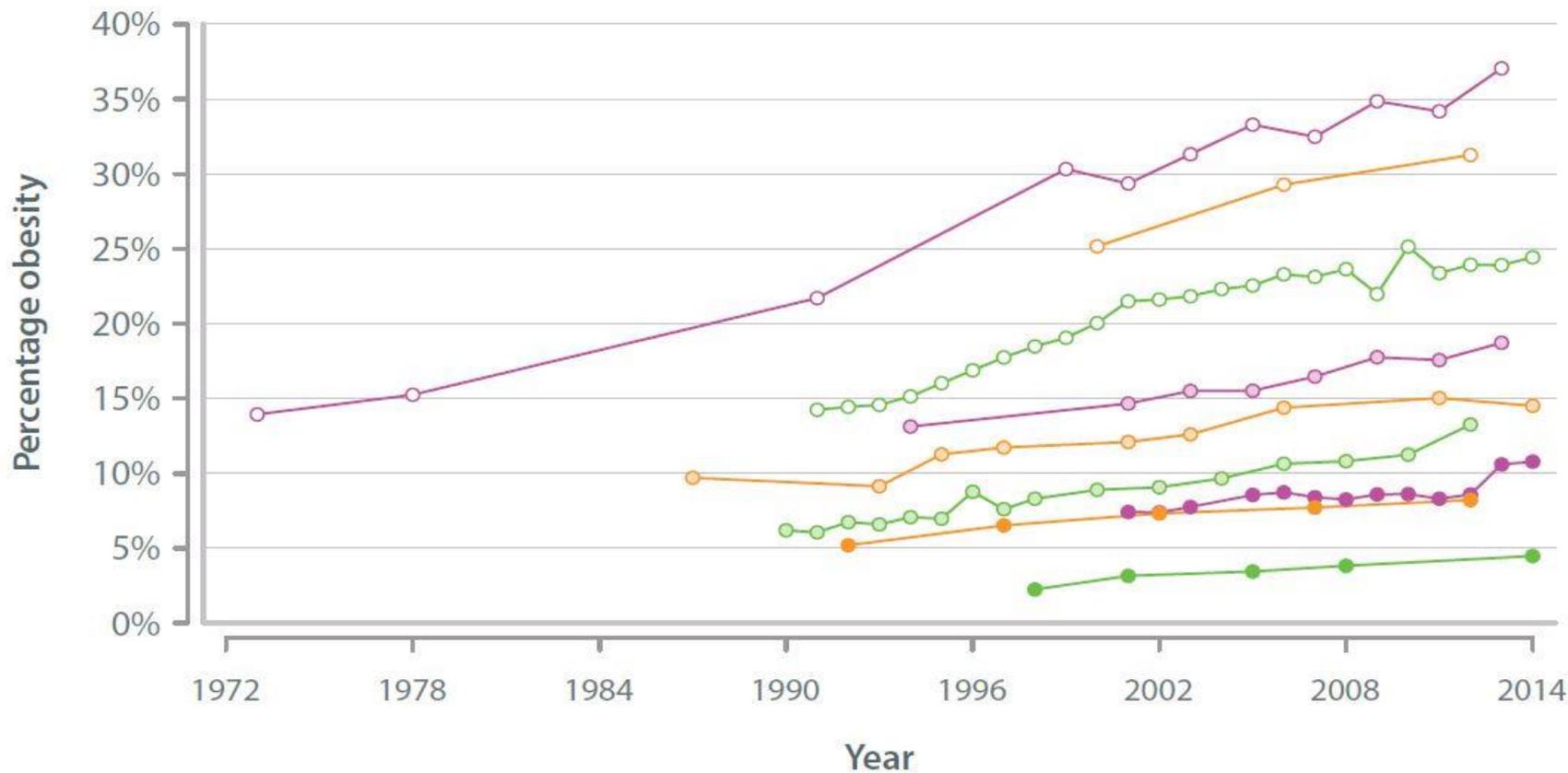
 - 28% obese men
 - 53% obese women

❖ Khader, Metab Syndr Relat Disord 2008



OECD data: Obesity rates over time

- United States
- Canada
- Italy
- Mexico
- Spain
- Switzerland
- England
- France
- Korea



Estimate of Bariatric Surgery Numbers, 2011-2017

Published June 2018

| | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 |
|-----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Total | 158,000 | 173,000 | 179,000 | 193,000 | 196,000 | 216,000 | 228,000 |
| Sleeve | 17.80% | 33.00% | 42.10% | 51.70% | 53.61% | 58.11% | 59.39% |
| RYGB | 36.70% | 37.50% | 34.20% | 26.80% | 23.02% | 18.69% | 17.80% |
| Band | 35.40% | 20.20% | 14.00% | 9.50% | 5.68% | 3.39% | 2.77% |
| BPD-DS | 0.90% | 1.00% | 1.00% | 0.40% | 0.60% | 0.57% | 0.70% |
| Revision | 6.00% | 6.00% | 6.00% | 11.50% | 13.55% | 13.95% | 14.14% |
| Other | 3.20% | 2.30% | 2.70% | 0.10% | 3.19% | 2.63% | 2.46% |
| Balloons | — | — | — | — | 0.36% | 2.66% | 2.75% |

The ASMBS total bariatric procedure numbers are based on the best estimation from available data (BOLD, ACS/MBSAQIP, National Inpatient Sample Data and outpatient estimations).





More statistics

- Around 200K procedure worldwide
- Lap gastric sleeve is gaining popularity 59%

- ❖ Steinbrook, N Engl J Med 2004
- ❖ IFSO report 2017
- ❖ ASMBS report 2017



Causes of Obesity



- Multi-factorial
 1. Genes
 2. Metabolic factors
 3. Psychological factors
 4. Social factors
 5. Behavioral factors





Dietary factors

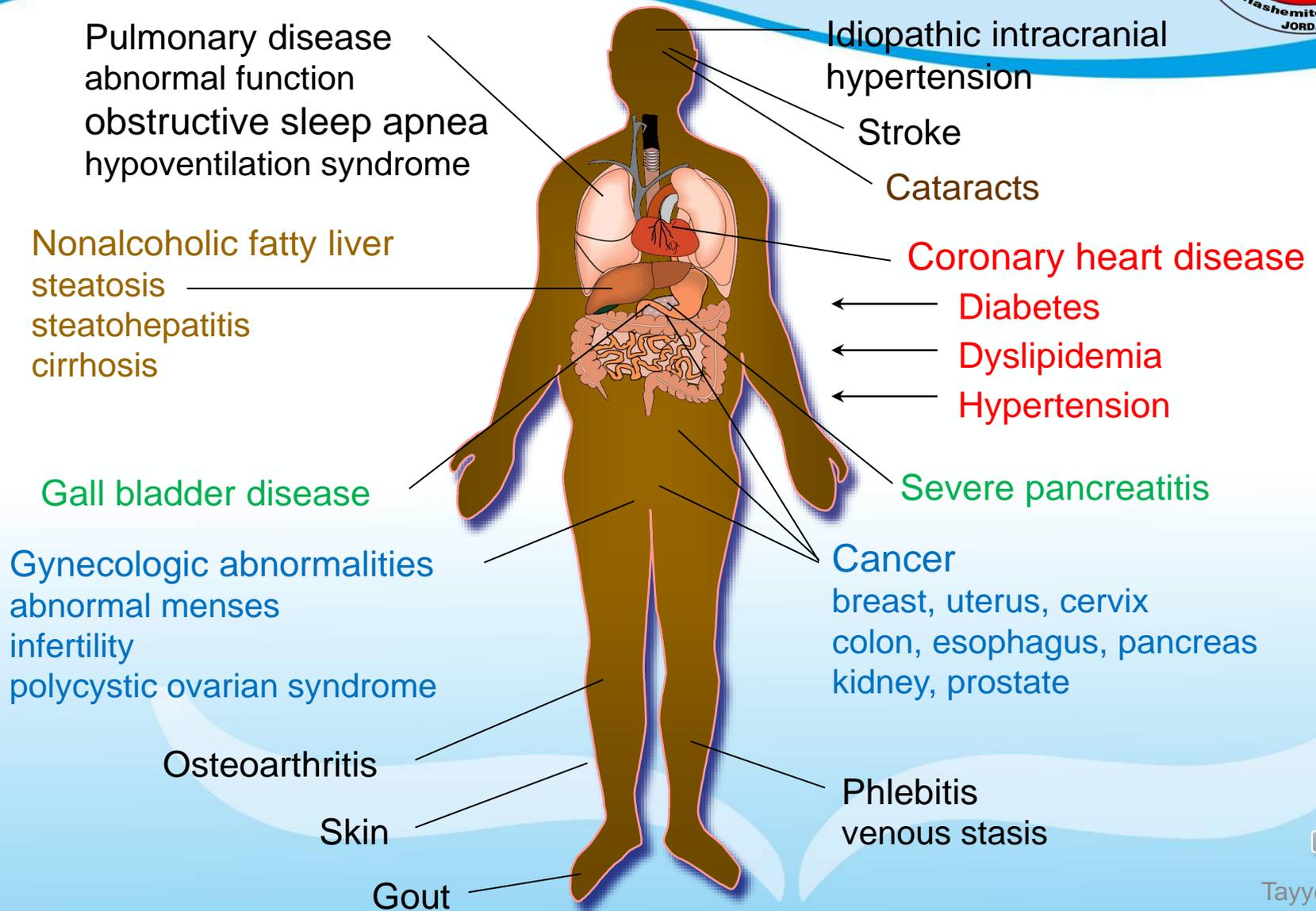
- Consumption of foods high in calories (excessive sugar and fat)
- Consumption of too much food (large portions)
- Lack of exercise/sedentary lifestyle

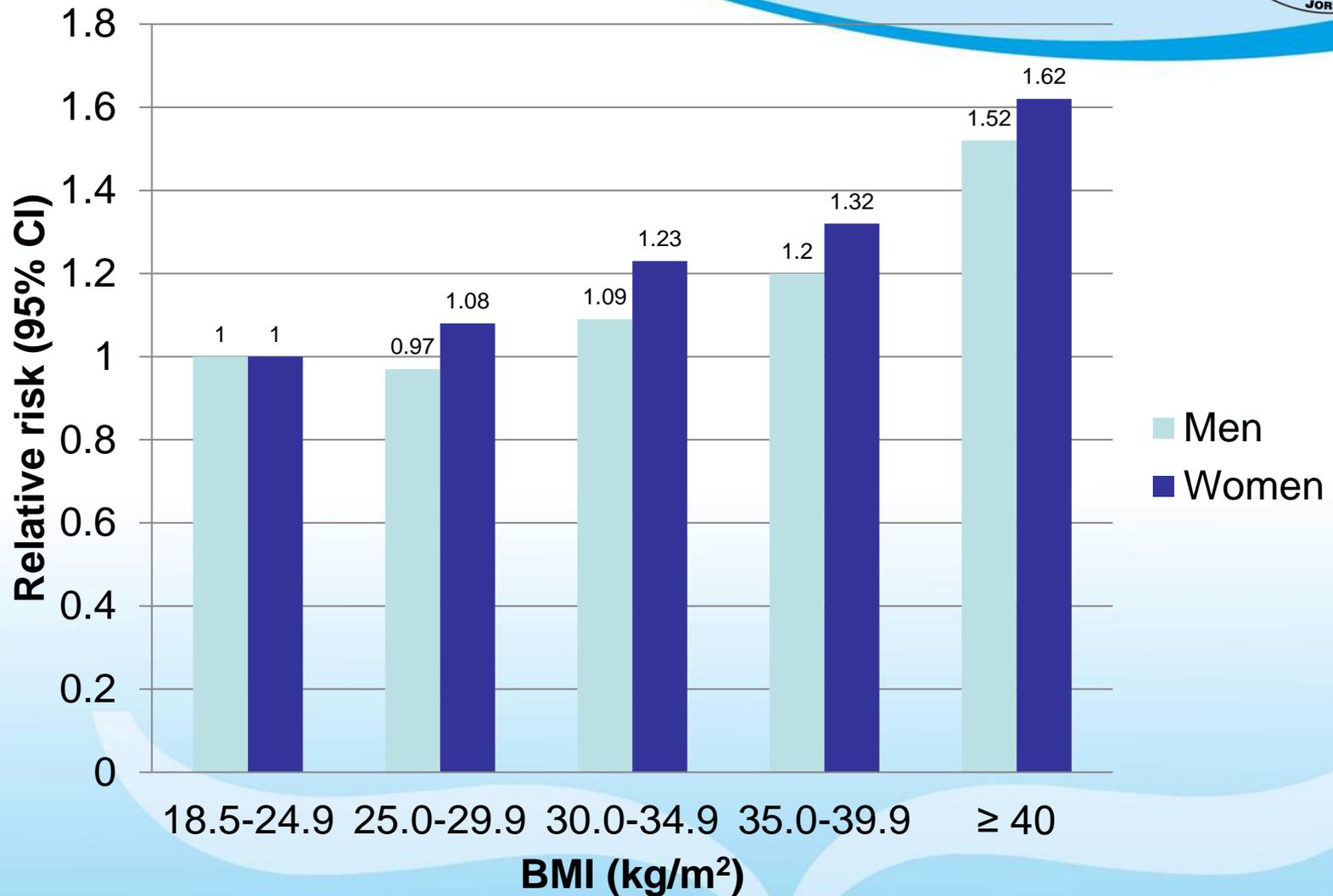


It is all about genes Is it inevitable?!

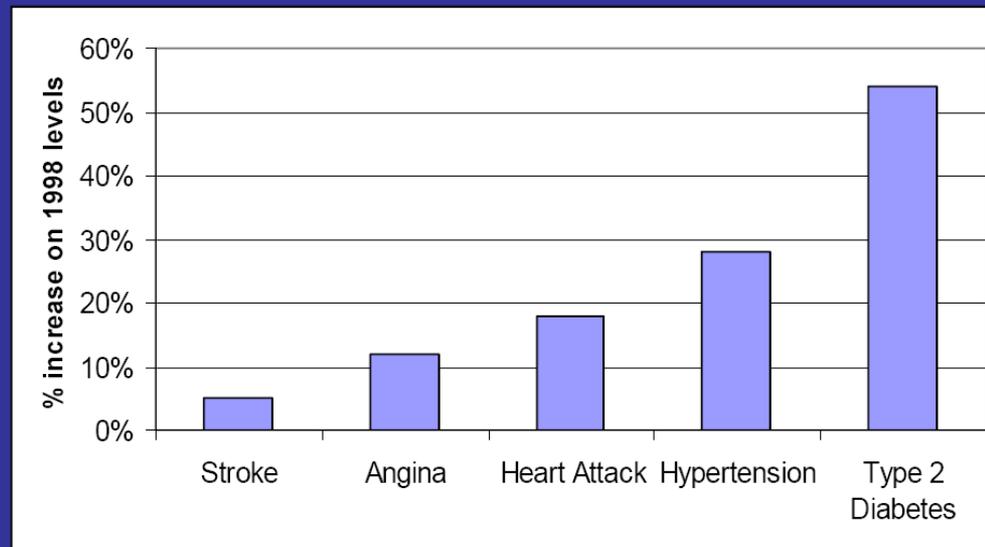


Medical Complications of Obesity





A dramatic rise in diseases linked to obesity is expected by 2023



Source: Choosing Health, Department of Health 2004



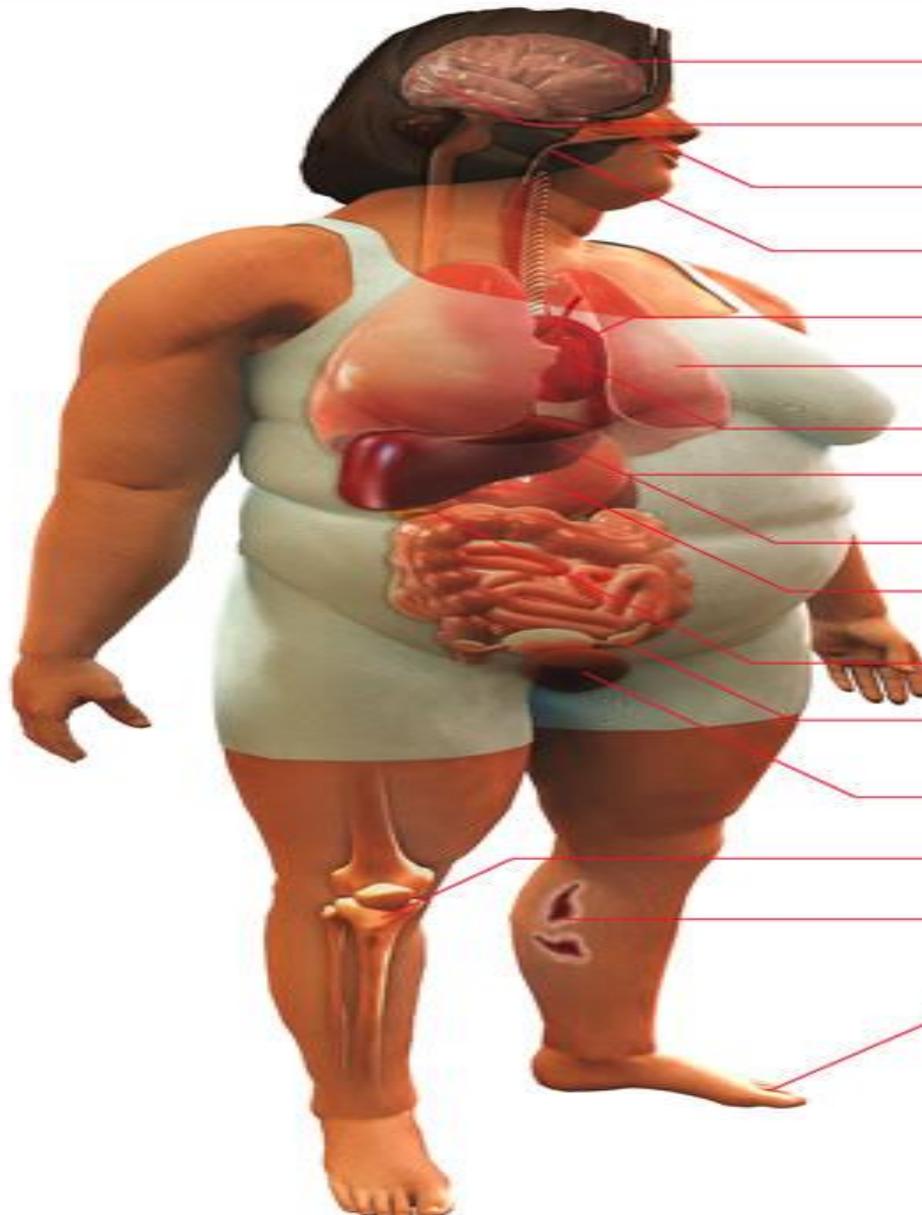


Why surgery



BARIATRIC SURGERY

Losing 50% to 70% of excess weight is just the beginning...*



- **Migraines**
57% resolved*
- **Depression**
47% reduced*
- **Pseudotumor cerebri**
96% resolved*
- **Obstructive sleep apnea**
74% to 98% resolved*
- **Hypercholesterolemia**
63% resolved*
- **Asthma**
69% resolved*
- **Hypertension**
69% resolved*
- **Nonalcoholic fatty liver disease**
90% reduced*
- **Metabolic syndrome**
80% resolved*
- **GERD**
72% resolved*
- **Type 2 diabetes**
82% to 98% resolved*
- **Polycystic ovarian syndrome**
79% resolution of hirsutism*/
100% resolution of menstrual dysfunction*
- **Urinary stress incontinence**
44% resolved*
- **Osteoarthritis/degenerative joint disease**
41% resolved*
- **Venous stasis disease**
95% resolved*
- **Gout**
72% resolved*

Quality of Life Improved
in 95% of patients.*
Mortality Reduced
by 89% in five-year period.*



- Bariatric surgery is effective.
- RCT (n=80), lap band resulted in greater excess wt loss at 2 years vs. intensive diet, lifestyle and medical therapy (P<0.001)





More evidence (2+)

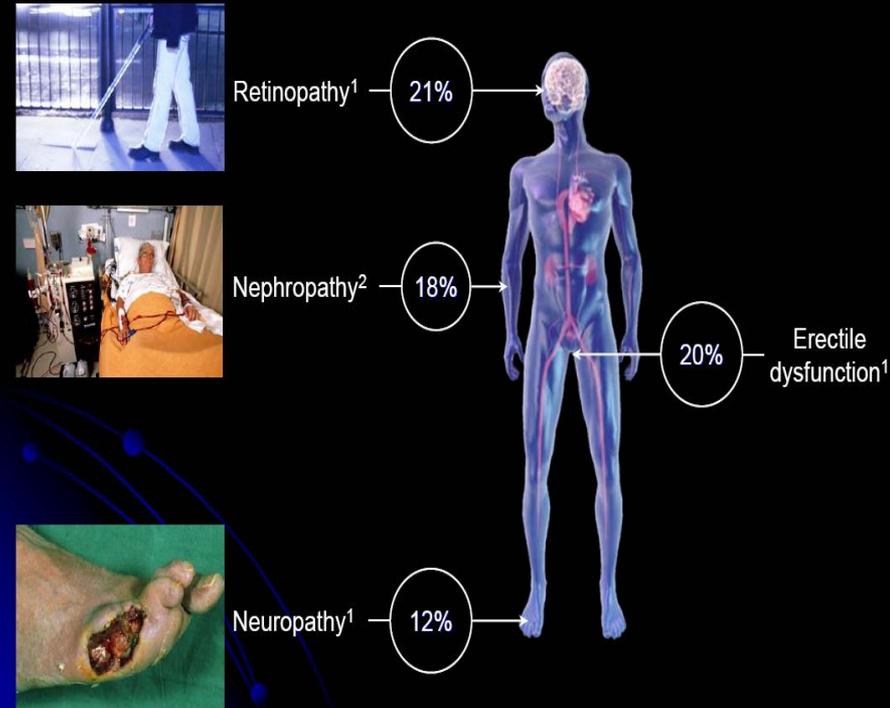
- Patients receiving surgery (lap band, Roux-en-Y) had 52.5%-77% excess weight loss at 10 years post surgery.
- Overall mortality is 29-40% lower in the 7-10 years post surgery of BMI-matched pts not receiving surgery



Best evidence (1+)

- RCT (n=60) with type 2 diabetes undergoing adjustable gastric band.
- Remission of diabetes in 73% of surgical arm of 13% in control group.

Type 2 diabetes – the microvascular burden at diagnosis a decade or so ago



1. UKPDS Group. *Diabetes Res* 1990; 13: 1–11.

2. The Hypertension in Diabetes Study Group. *J Hypertens* 1993; 11: 309–317.



Bariatric Surgery





2015 data merge

100,092
operations

- 8 single centres
- 7 multi-centre submissions
- 3 national registries



2016 data merge

142,748
operations

- 19 single centres
- 5 multi-centre submissions
- 7 national registries



2017 data merge

196,188
operations

- 21 single centres
- 13 multi-centre submissions
- 8 national registries



Surgery is the only way



- Behavioral changes result in **4%** of weight loss
- Pharmacotherapy results in **8%** of weight loss
- **90%** of obese patient treated non-surgically will relapse within 5 years
- **Bariatric surgery** is the only approach to achieve a significant and sustainable weight reduction beyond one year

Salem L, Jensen CC, Flum DR. Are bariatric surgical outcomes worth their cost? A systematic review. J Am Coll Surg 2005; 200: 270-8

McTigue KM, Harris R, Hemphill B , et al. Screening and interventions for obesity in adults: summary of the evidence for the U.S. Preventive Services Task Force. Ann Intern Med 2003; 139: 933-49



SIGN Guidelines



- SIGN 115 – Feb 2010



Key Recommendations



- Bariatric surgery should be included as part of an overall clinical pathway for adult weight management
- Should be considered on an individual basis following risk/benefit assessment in pts fulfilling the following criteria:
 - BMI $\geq 35\text{kg/m}^2$
 - ≥ 1 severe co morbidities expected to improve significantly with weight reduction (e.g. metabolic syndrome)





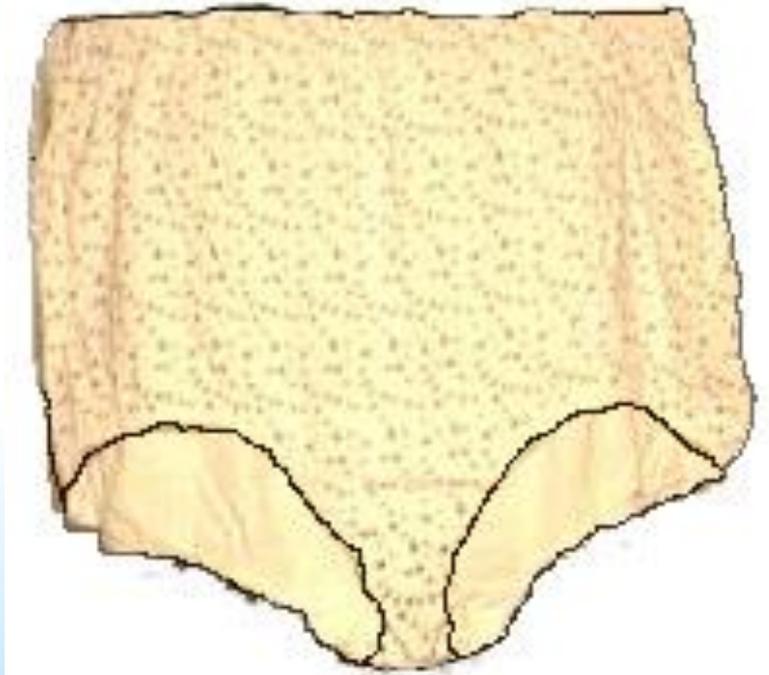
Bariatric MDT

- Bariatric surgeon
- Anaesthetist
- Endocrinologist
- Dietician
- Bariatric nurse
- Pulmonary consultant
- Psychologist
- Cardiologist



Patient Expectations

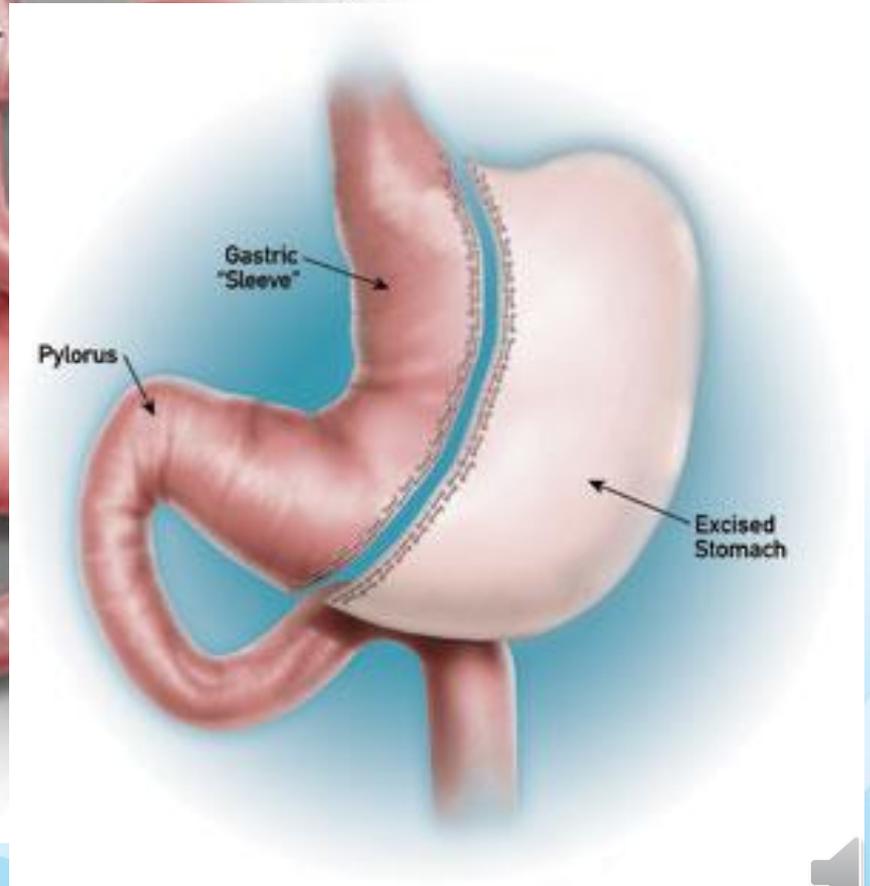
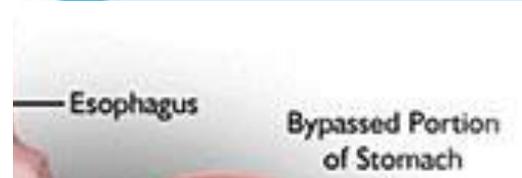
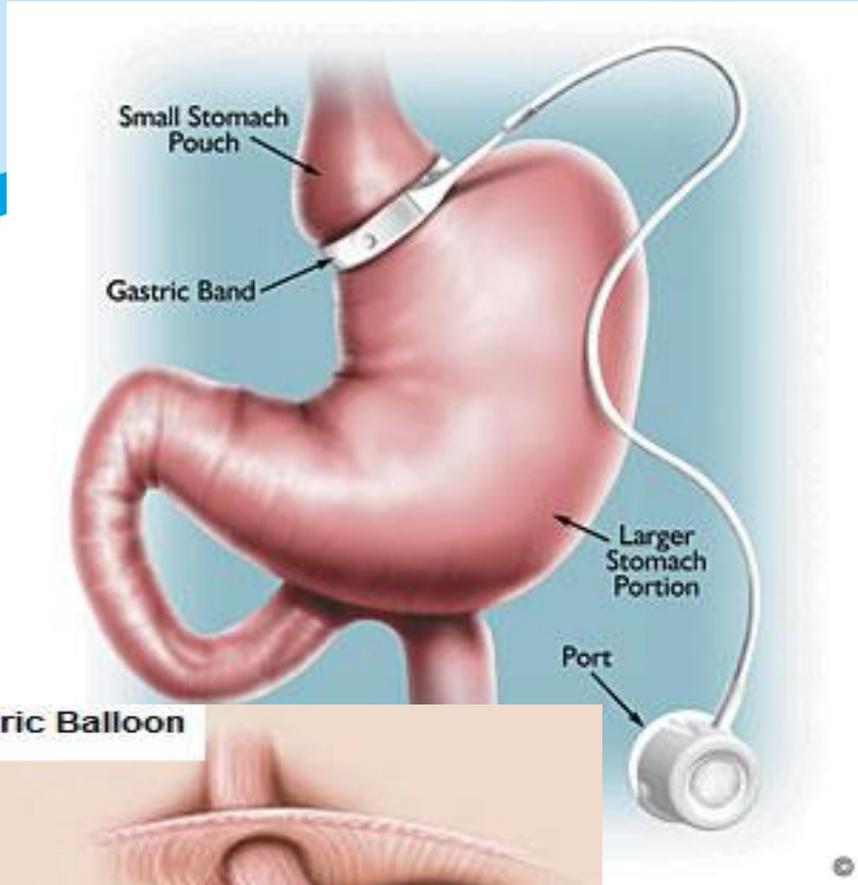
Before



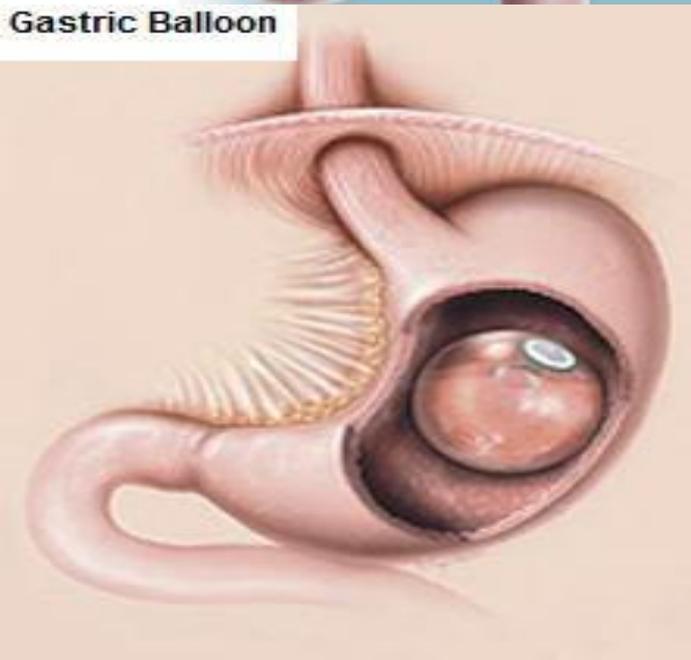
After



Options



Gastric Balloon



Laparoscopic Bariatric Procedures



- Common procedures
 - Lap Sleeve gastrectomies (LSG)
 - Roux-en-Y gastric bypasses (RYGB)
 - Gastric balloons
- Less common
 - Gastric Band (LAGB)
 - Mini gastric bypass
 - Single anastomosis duodenal ileal bypass (SADI-S)
 - duodenal switch (DS) /biliopancreatic diversion



Principles for Bariatric Emergencies



- Abdominal emergencies in the bariatric patient are similar to other patients
- Detailed bariatric history:
 - type of surgery
 - when where who
 - complication
- Unstable patient, worsening sepsis:
 - theater: do not delay





Challenges of bariatric patients

- Clinical manifestation of peritonitis
- Difficult veins
- Blood pressure measurement
- Bed capacity
- CT scan capacity
- General surgeon unfamiliar with the procedure





Early complications < 30 Days

- Bleeding
- Leak
- Venous thrombo-embolic event (VTE)
- Stomal stricture
- Stomal ulcer
- Gastric outlet obstruction
- Intestinal obstruction





Late complications

- Gallstones
- Stomal stricture
- Stomal ulcer
- Portal vein thrombosis
- Intestinal obstruction
- Leak / fistula
- Dumping syndrome
- Nutritional deficiencies



Acute abdomen in bariatric patient



- Leak
- Leak
- leak
- Intra peritoneal bleeding
- Intestinal obstruction



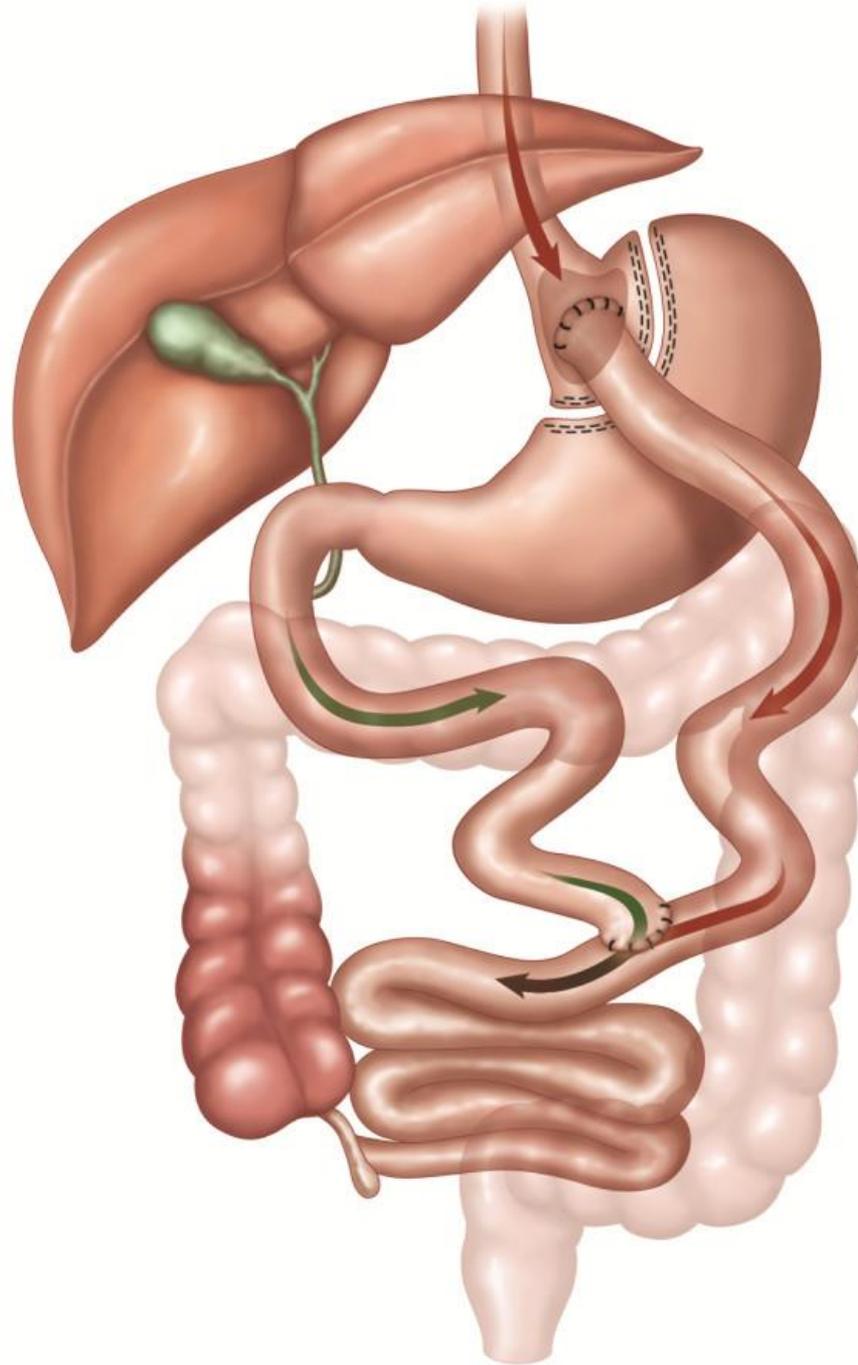


Leaks in general

- Abdominal pain in first 4 weeks: assumed leak until proven otherwise
- Signs of leak: fever, tachycardia, WBC ↑
- Contrast studies / CT scan: may miss leaks
- Free air and fluid are not normal at 1 week or later after surgery
- If in doubt: laparoscopy



RYGB







Leak after RYGB

- G-J anastomosis: Most common
- J-J anastomosis
- Staple line on the residual stomach
- Missed enterotomy





Leak management

- Stable patient
 - Percutaneous drain
 - Endoscopic stent placement
 - Fibrin glue injection
 - Endoscopic clip
- Unstable patient
 - OR: lap vs. open



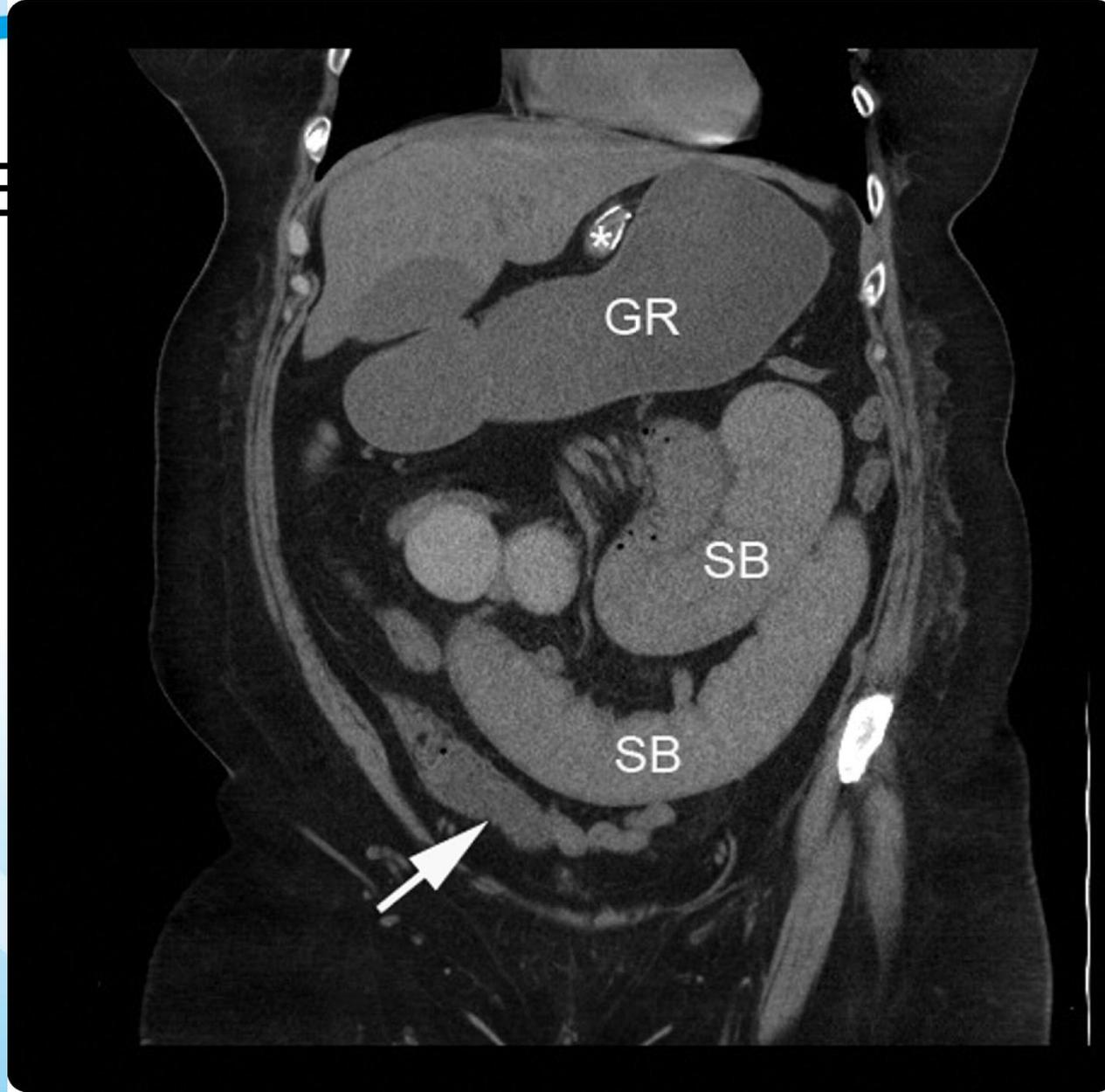
Luminal Bleeding after RYGB



- Endoscopy – clipping of bleeder
- Laparoscopy
 - Bleeding from the J-J anastomosis
 - Bleeding from the gastric remnant



- RYGE



Intestinal obstruction after RYGB



- Causes
 - Adhesions
 - Peterson 's space
 - Internal hernia – small bowel mesenteric defect
 - technical error :Closed loop or Twisted loop
 - Narrow/occluded jejuno-jejunal anastomosis
 - Blood clot at jejuno-jejunal anastomosis
 - Port-site hernia



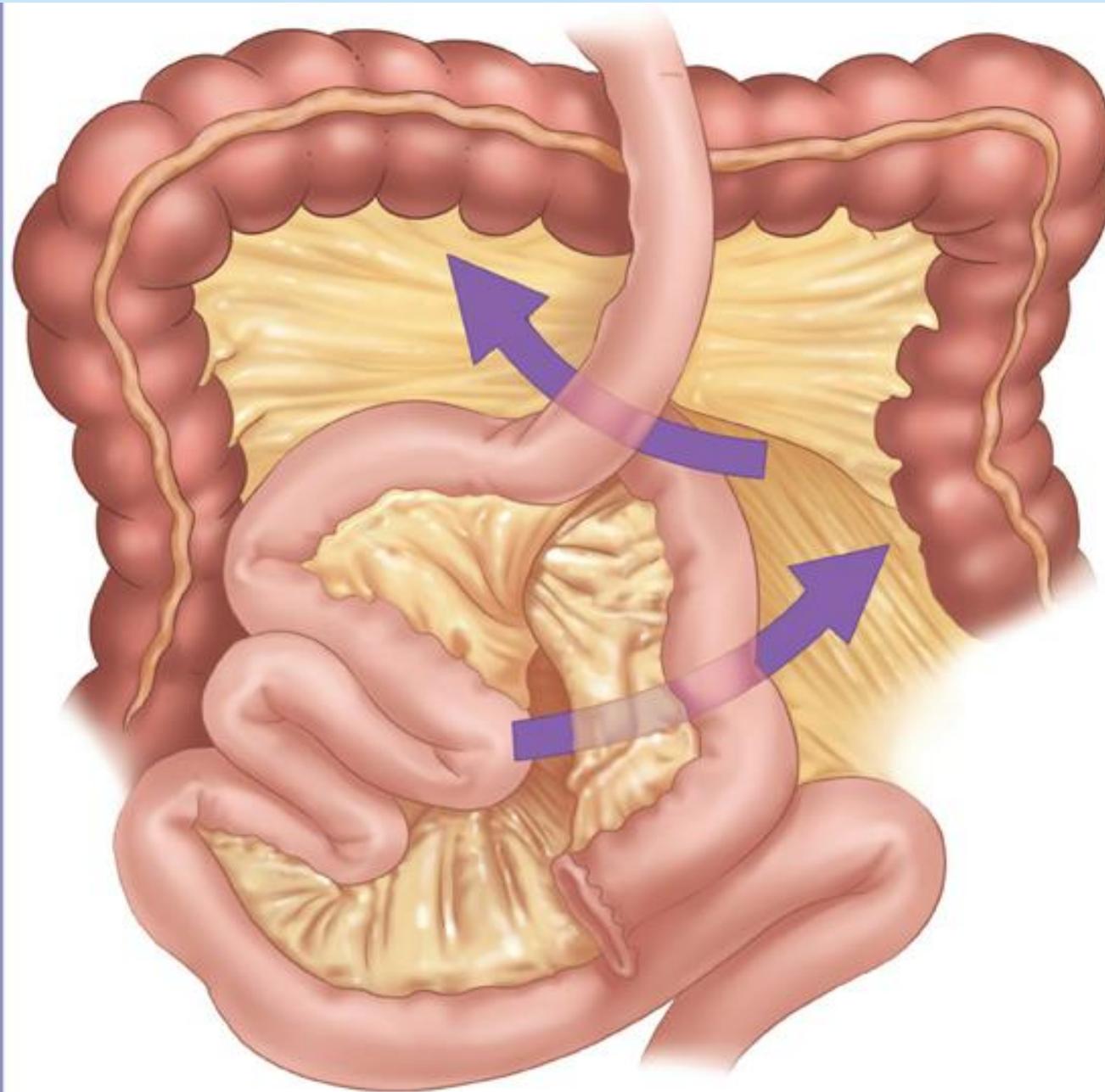
Manifestation of intestinal Obstruction after RYGB

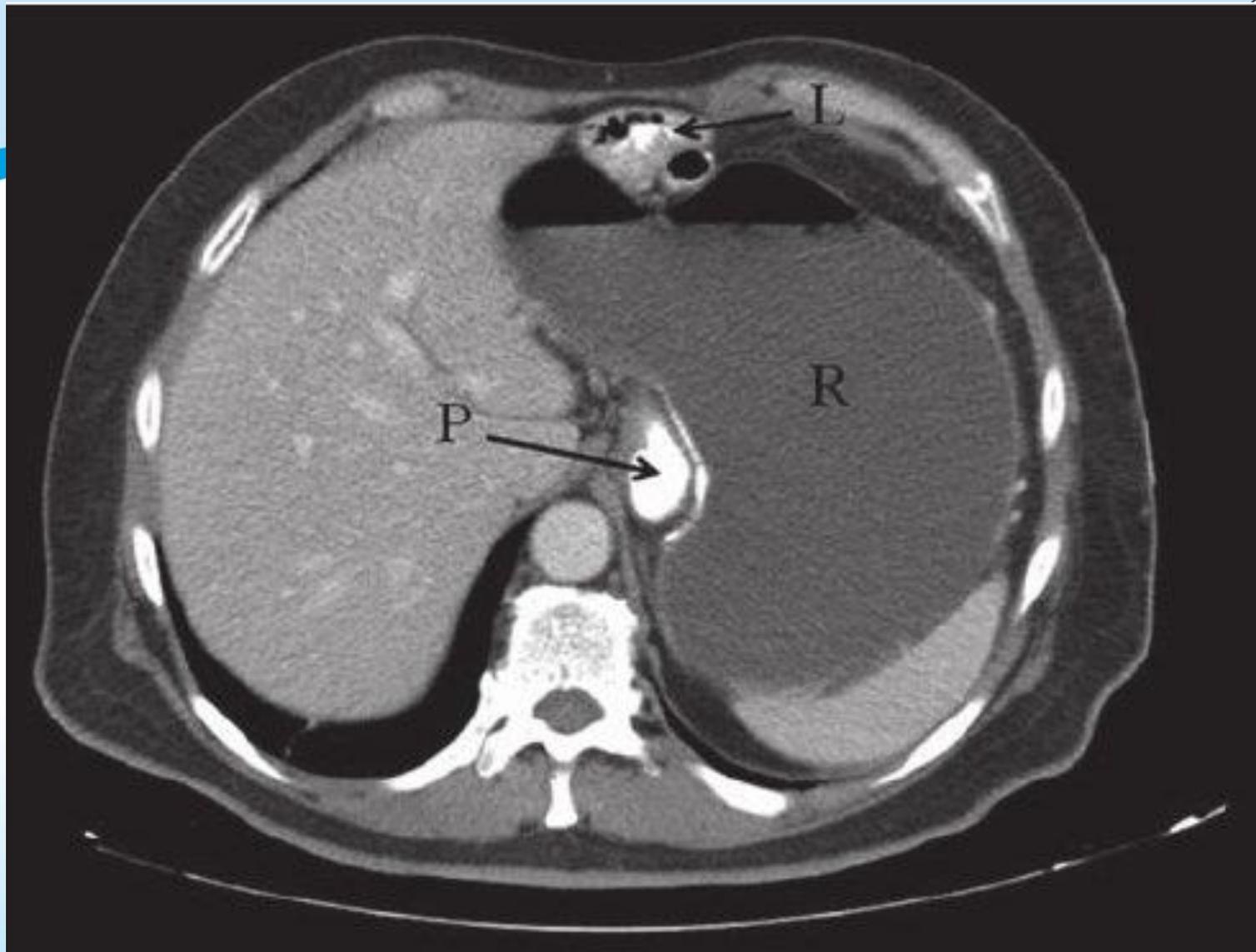


- obstruction of the biliopancreatic limb
 - Upper abdominal pain
 - Deranged liver function tests
 - Distention of the gastric remnant
- obstruction of the alimentary limb
 - Inability to tolerate oral intake
- Obstruction of the common channel
 - Bilious vomiting









❖ O'Donnell, Surgical Intensive Care Medicine
2010





Dilated Gastric Remnant

- Acute Dilatation
 - Causes
 - ✓ Obstruction at J-J, BP limb or CC
 - ✓ Clot: staple-line bleeding.
 - ✓ Technical error in construction of the anastomosis.
 - CT guided or operative decompression of remnant.
- Chronic Dilatation
 - Peptic ulcer, vagotomy, cancer, gastroparesis
 - Duodenum remains collapsed







Marginal Ulcer after RYGB

- Incidence: 5-15%
- Management
 - Non-operative management
 - ✓ Stop Smoking
 - ✓ Stop NSAID
 - ✓ PPI
 - Surgical
 - ✓ Revision of anastomosis

❖ Patel, Surg Obes Relat Dis 2009





Gallstone

- Risk of developing GS: 15-30%
- Prophylactic cholecystectomy: controversial



Management of CBD stones after RYGB

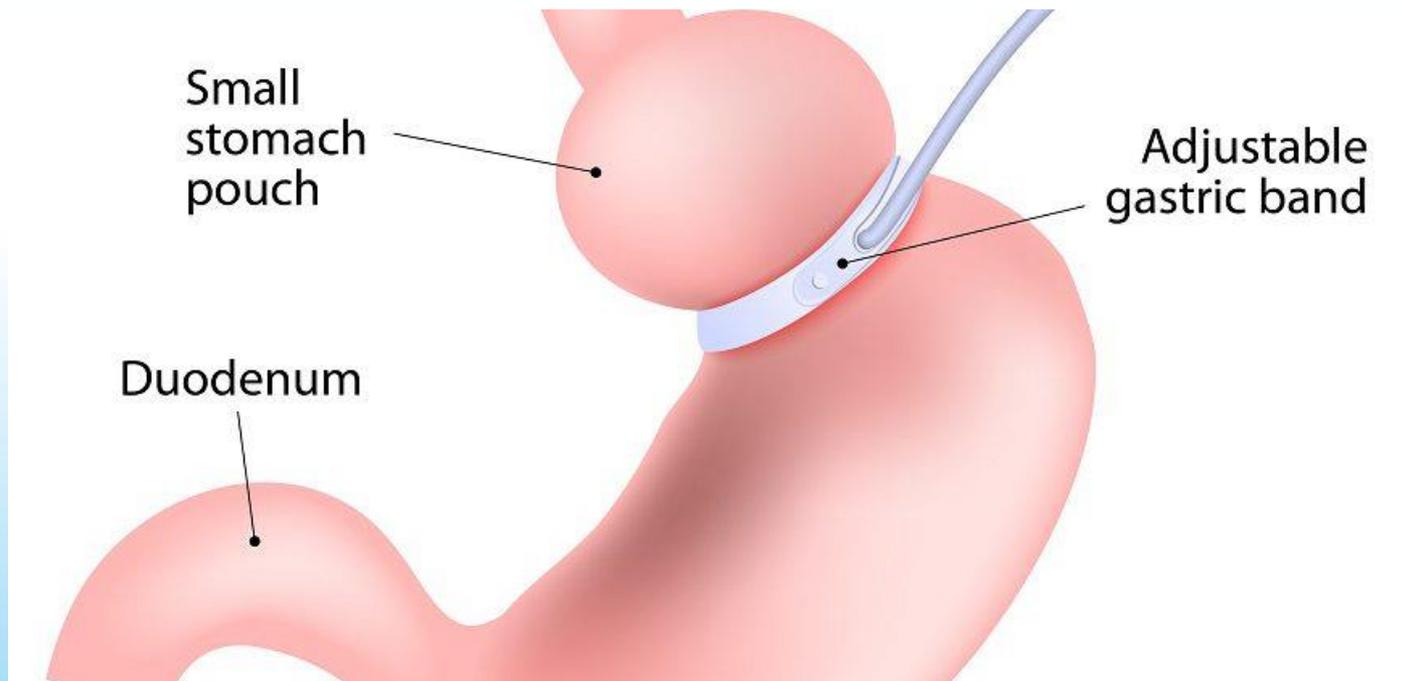


- Laparoscopic bile duct exploration
- Trans-gastric ERCP
- Percutaneous trans-hepatic biliary drainage



Dysphagia after gastric band

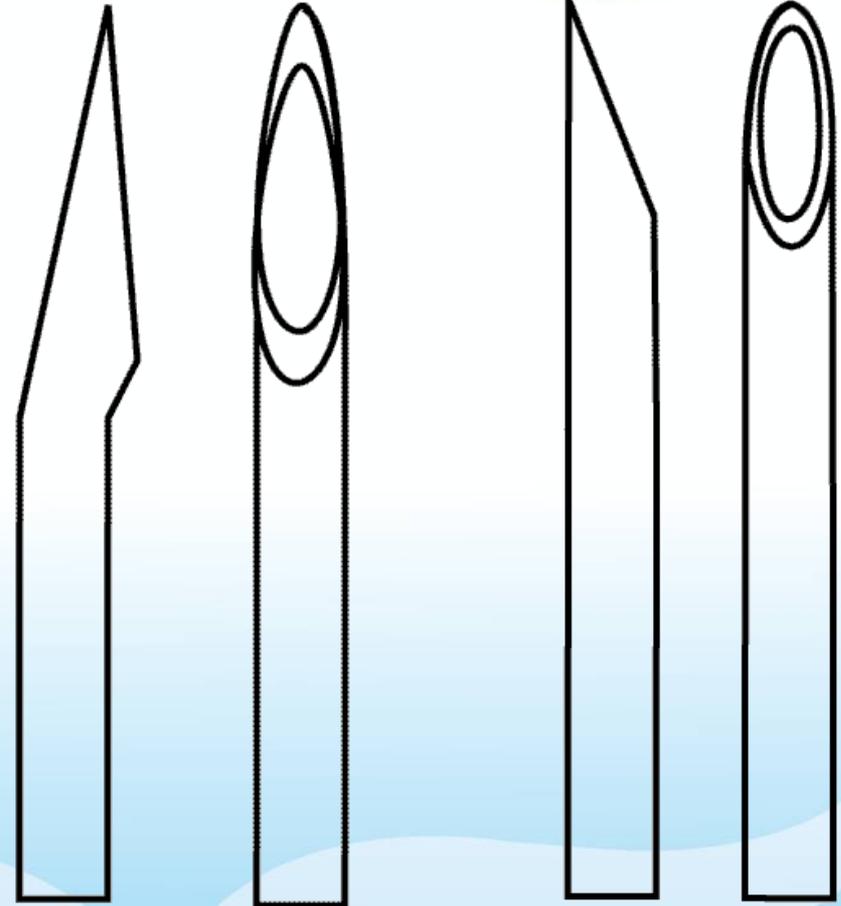
- Over-inflation
- Slippage
- Gastric wall oedema





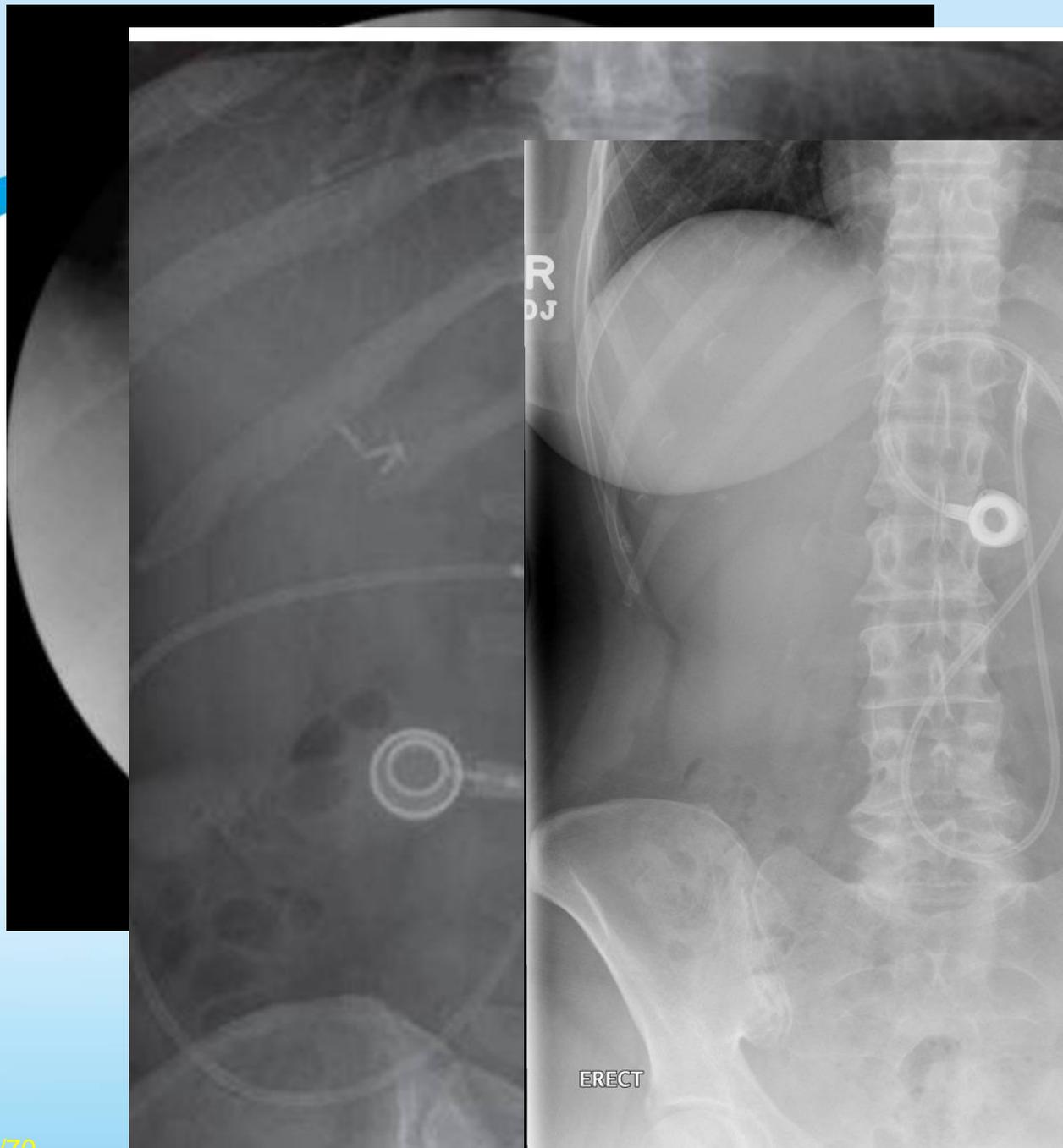
Over-inflation band

- Deflate:
 - Non coring huber needle



Huber Point Needle Standard Point



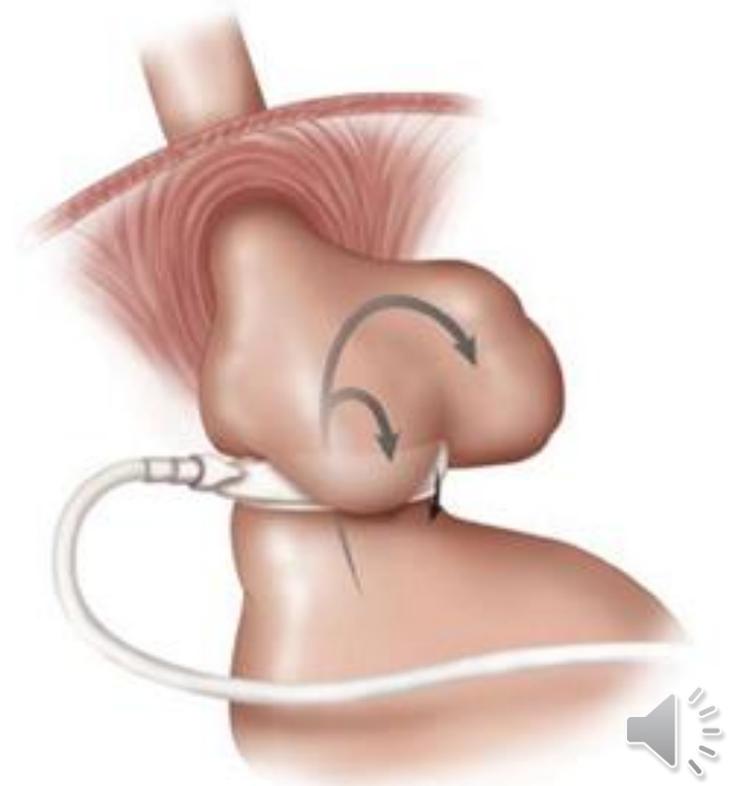
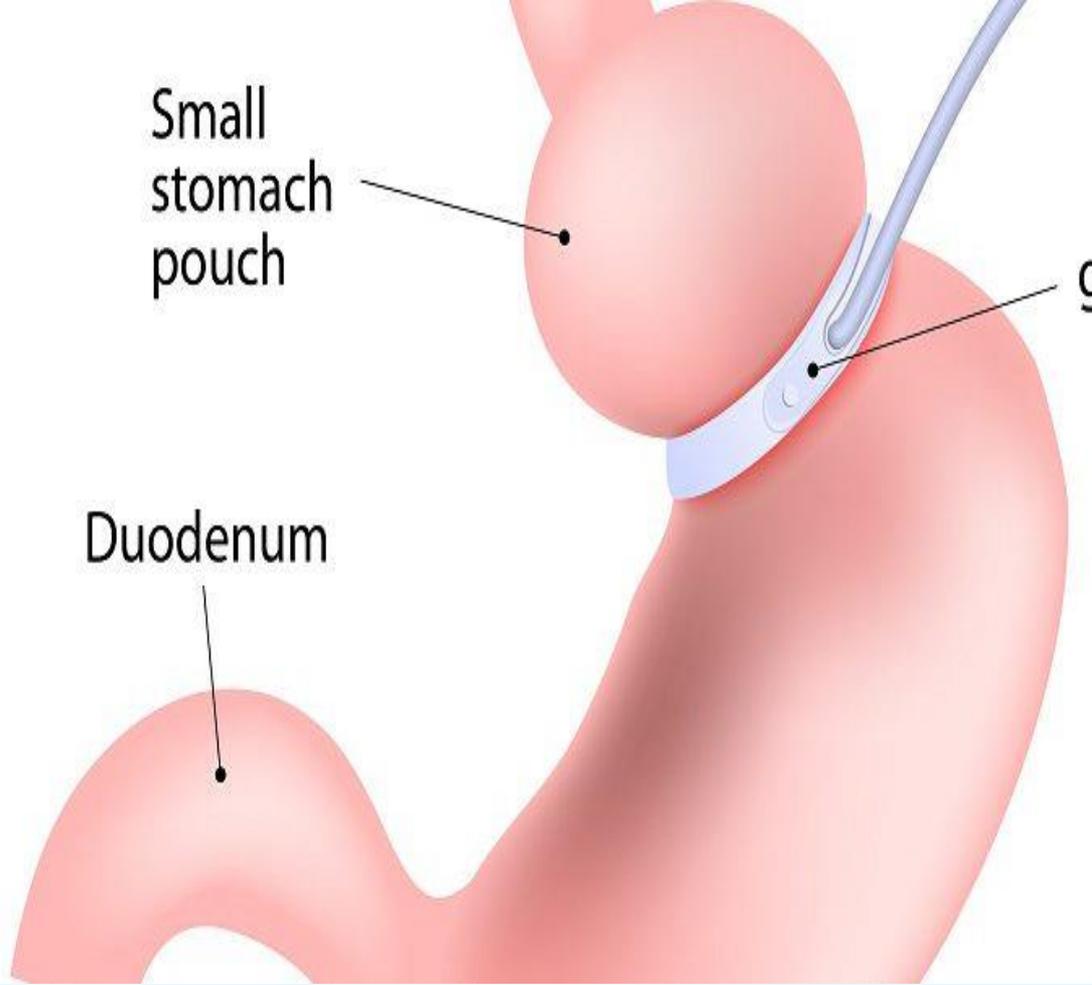




Small stomach pouch

Adjustable gastric band

Duodenum



Band Slippage

- Upward migration of the gastric wall leading to band displacement
- Presentation:
 - Pain
 - Dysphagia
 - Gastric outlet obstruction
 - Gastric wall necrosis





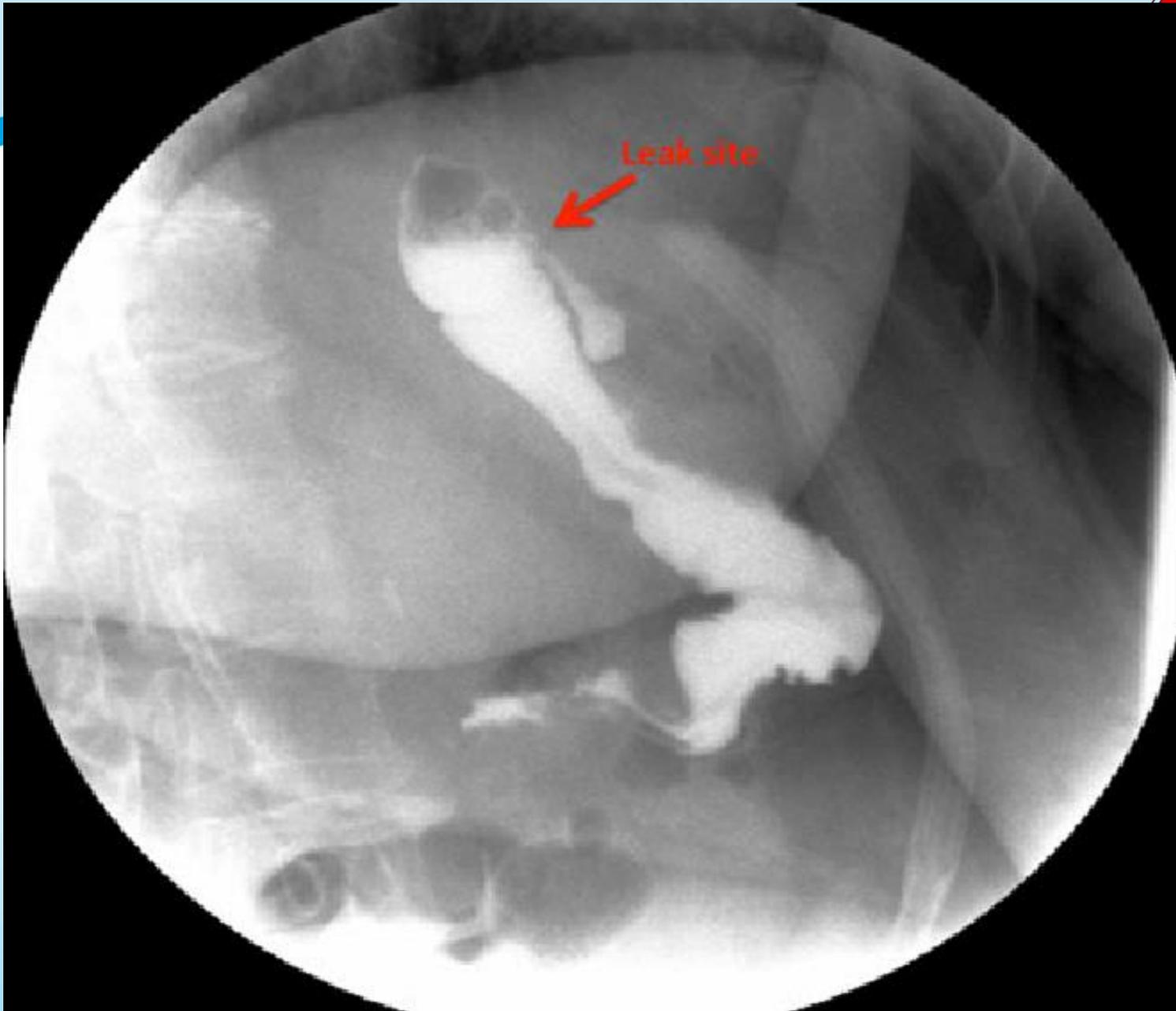
Band slippage management

- Deflate band
- Laparoscopy
 - Reduce the stomach without opening the band
 - Open the band, reduce the stomach, reposition the band
 - Band removal and consider another bariatric procedure



LSG





Leak after LSG

- Most commonly proximal end
 - Poor blood supply
 - Thin tissue
 - Narrow sleeve
- Management
 - Unstable: OR
 - Stable:
 - ✓ Percut drain
 - ✓ Endoscopic stent

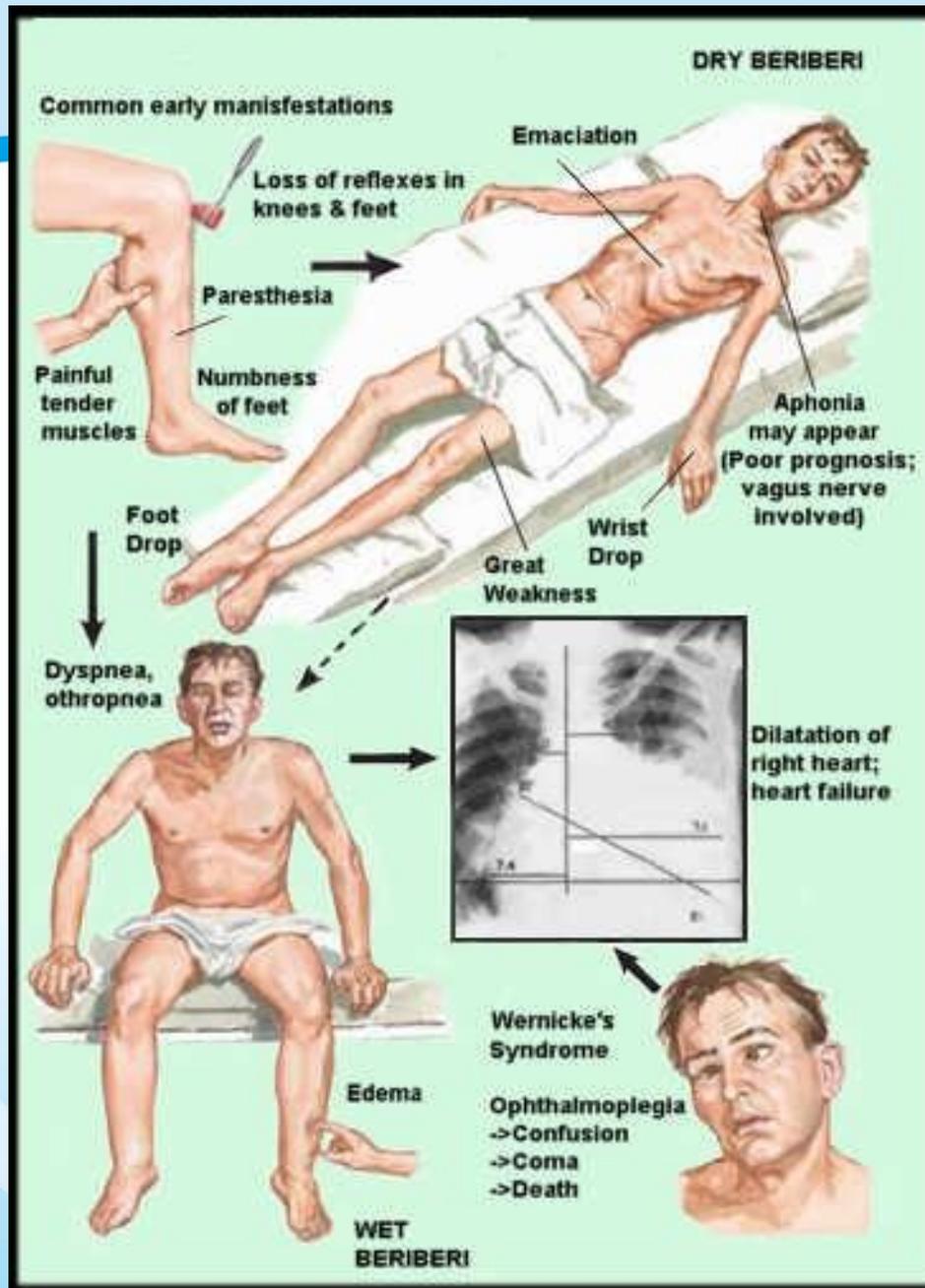




Bleeding after LSG

- Luminal
 - endoscopy
 - surgical re-exploration
- Intra-peritoneal
 - surgical re-exploration

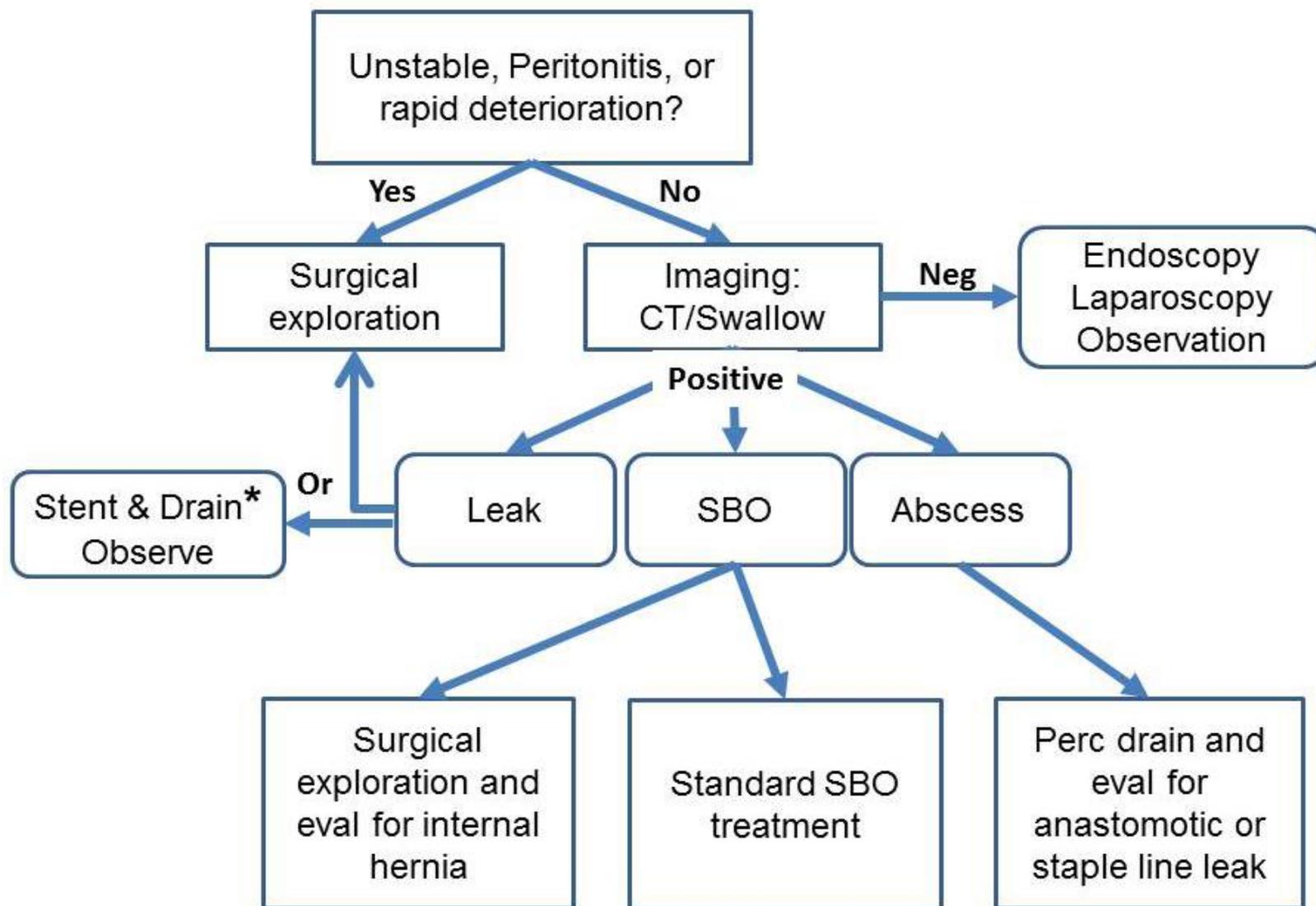




| Nutrient | LAGB | RYGB | BPD/DS |
|-------------------------|------|------|--------|
| Macronutrients | | | √√√ |
| Thiamin ^a | √ | √ | √ |
| Iron ^b | | √√ | √ |
| Vitamin B ₁₂ | | √√√ | √ |
| Vitamin D | | √√√ | √√√ |

❖ Mechnick, Obes 2009







Final words

- Before operating
 - Contact the bariatric surgeon
 - Find out as much as you can about what was done
 - Don't get misled by false radiology





Final words

- If you decide to re-operate
 - Ensure you have suitable lap instruments and ports: length
 - Liver retractor
 - Methylene blue available
 - Split leg OR table
 - Arms tucked-in at side
 - head-up incline





DR. RAED TAYYEM

استشاري جراحة السمرة والجهاز المضمعي والمنظار





Thank You.

