SADI-S: Short and long-term complications
What to look for and how to manage

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Conflicts of Interest

Research support - Johnson and Johnson, Medtronic, GI-Windows

Advisory Board - Johnson and Johnson, Bausch, Novo-Nordisk

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Plan

- Introduction
- Management of early complications
  - Leak, hemorrhage
- Management of late complications
  - GI complications
  - internal hernia – GERD
  - Protein-energy malnutrition

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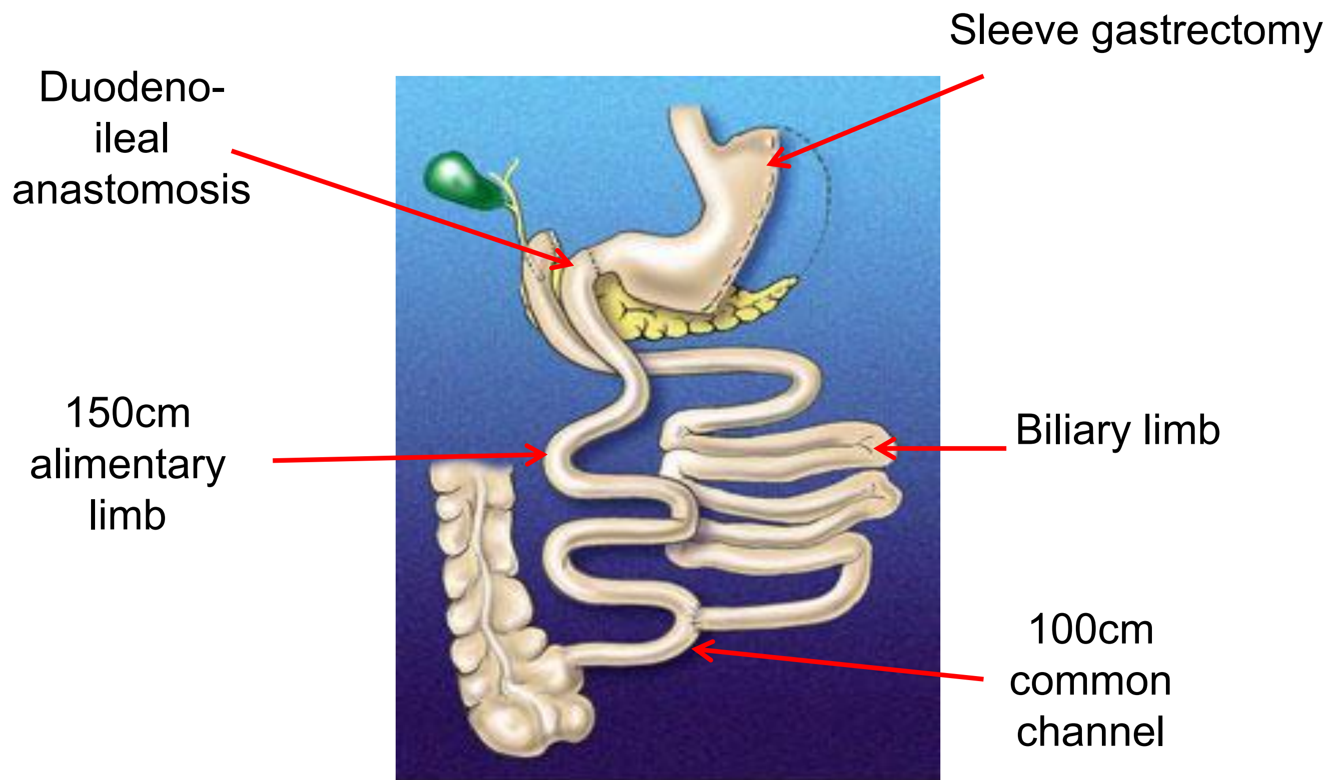
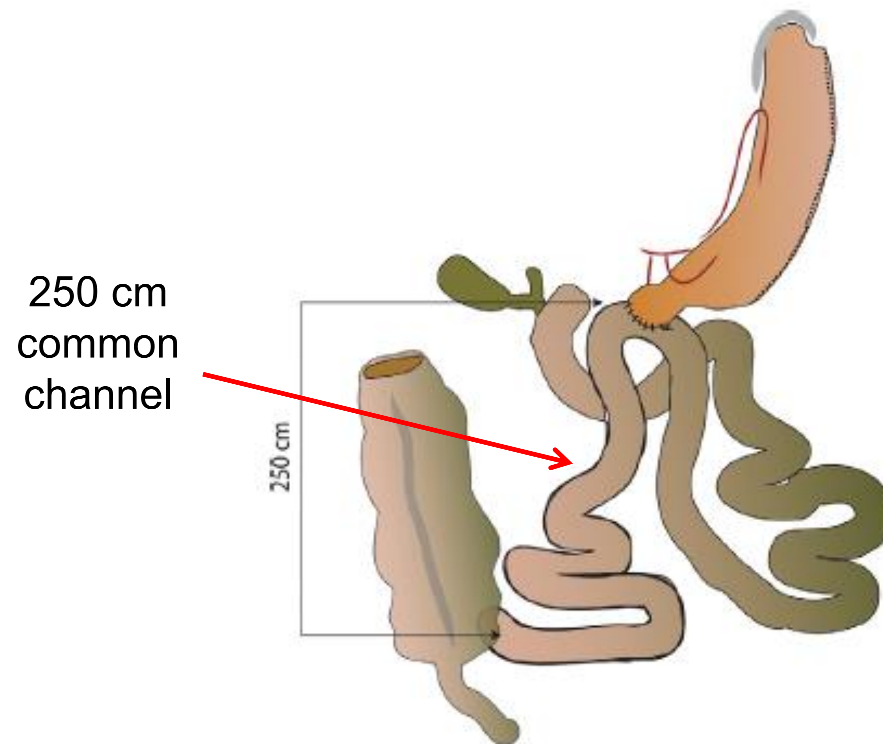
DS versus SADI-S
Single-Anastomosis Duodeno-Ileal bypass





Obes Surg. 2007 Dec;17(12):1614-8. Epub 2007 Nov 27.

Proximal duodenal-ileal end-to-side bypass with sleeve gastrectomy: proposed technique.

Sánchez-Pernaute A[1], Rubio Herrera MA, Pérez-Aguirre E, García Pérez JC, Cabrerizo L, Díez Valladares L, Fernández C, Talavera P, Torres A.

Sanchez-Pernaute et al, Obes Surg 2007

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Post-operative complications

Clavien-Dindo	DS (60)	SADI (61)	p
1	31	35	NS
2	59	52	NS
3 – requiring surgical, endoscopic or radiological intervention			
3a	2	2	NS
3b	4	6	NS
4a	0	0	
4b	0	0	
5	0	0	
Total	96	95	NS
Related to surgery	51	41	NS
Reoperation	2 SBO (1) leak (1)	2 Leak (1) Abcess (1)	NS

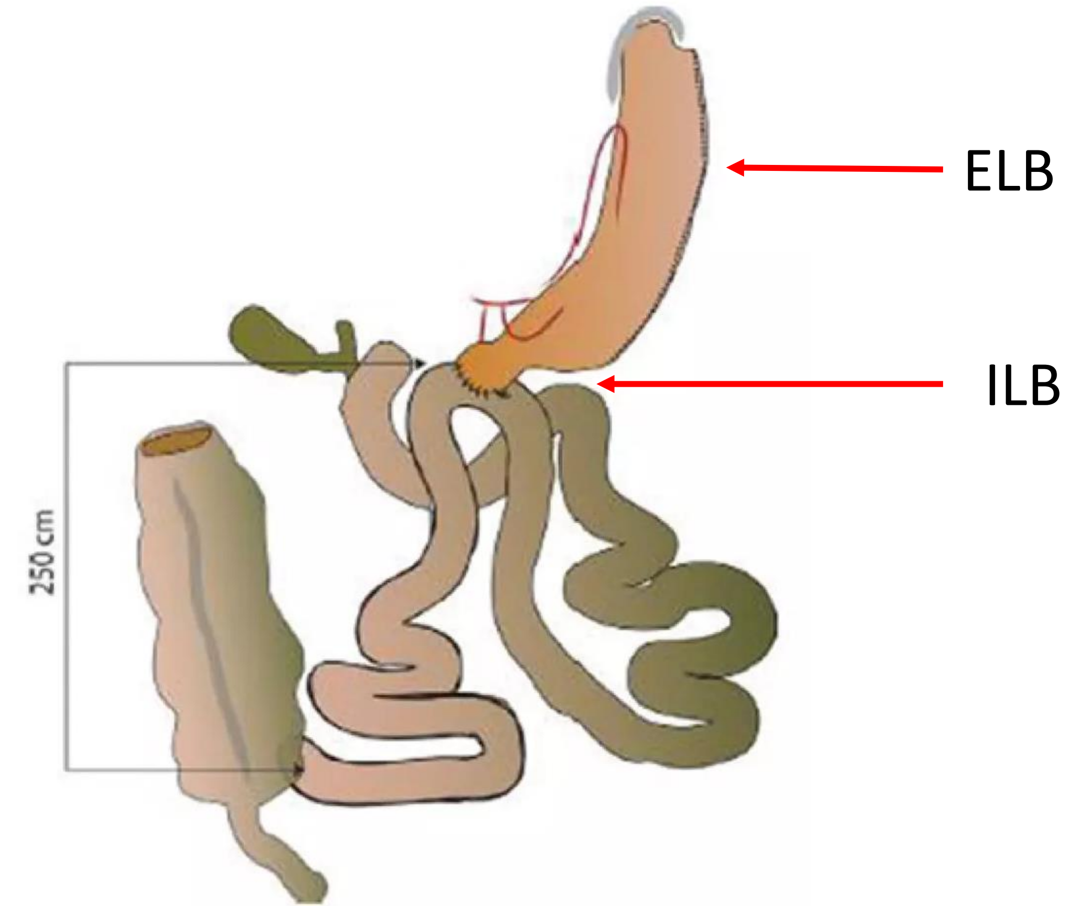
10% vs 13%

Bleeding <72h – 1-2%

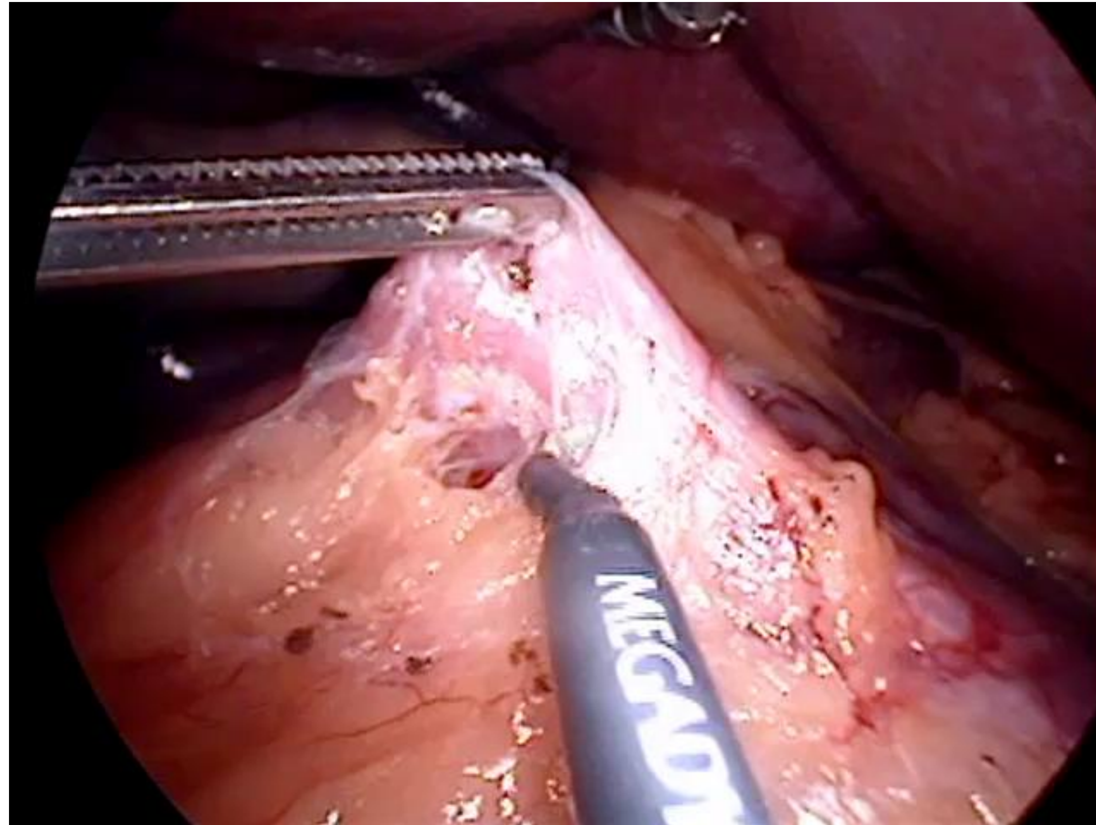
- Tachycardia (>120/min)
  - Hypotension
  - Abdominal/chest pain – Kehr sign
  - Hematemesis/ Melena
- Volume ressuscitation
- Hold anticoagulants
- Tranexanic acid 1 gram IV
- Blood work - crossmatch

- If patient is stable (- 75%)
  - Abdominal CT-scan with oral contrast
  - +/- Chest CT
- Intraluminal Bleeding versus Extraluminal
  - Exploratory laparoscopy combined with endoscopy

Intra-luminal vs extra-luminal



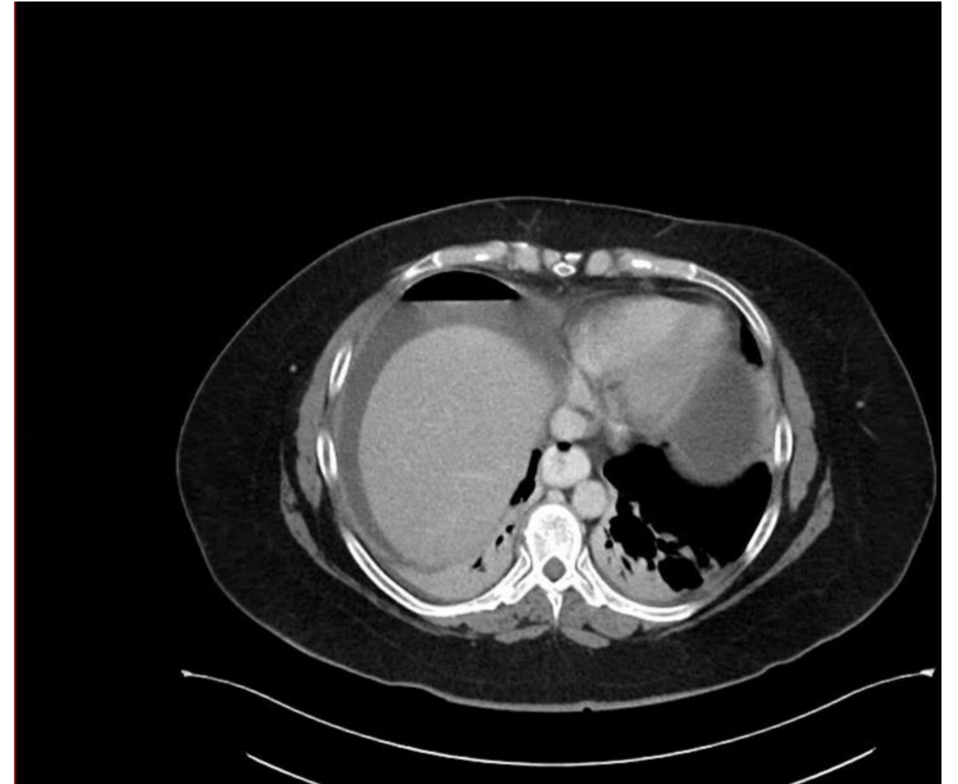
Intra-operative consideration



Acute Leak (<7d) - <1%

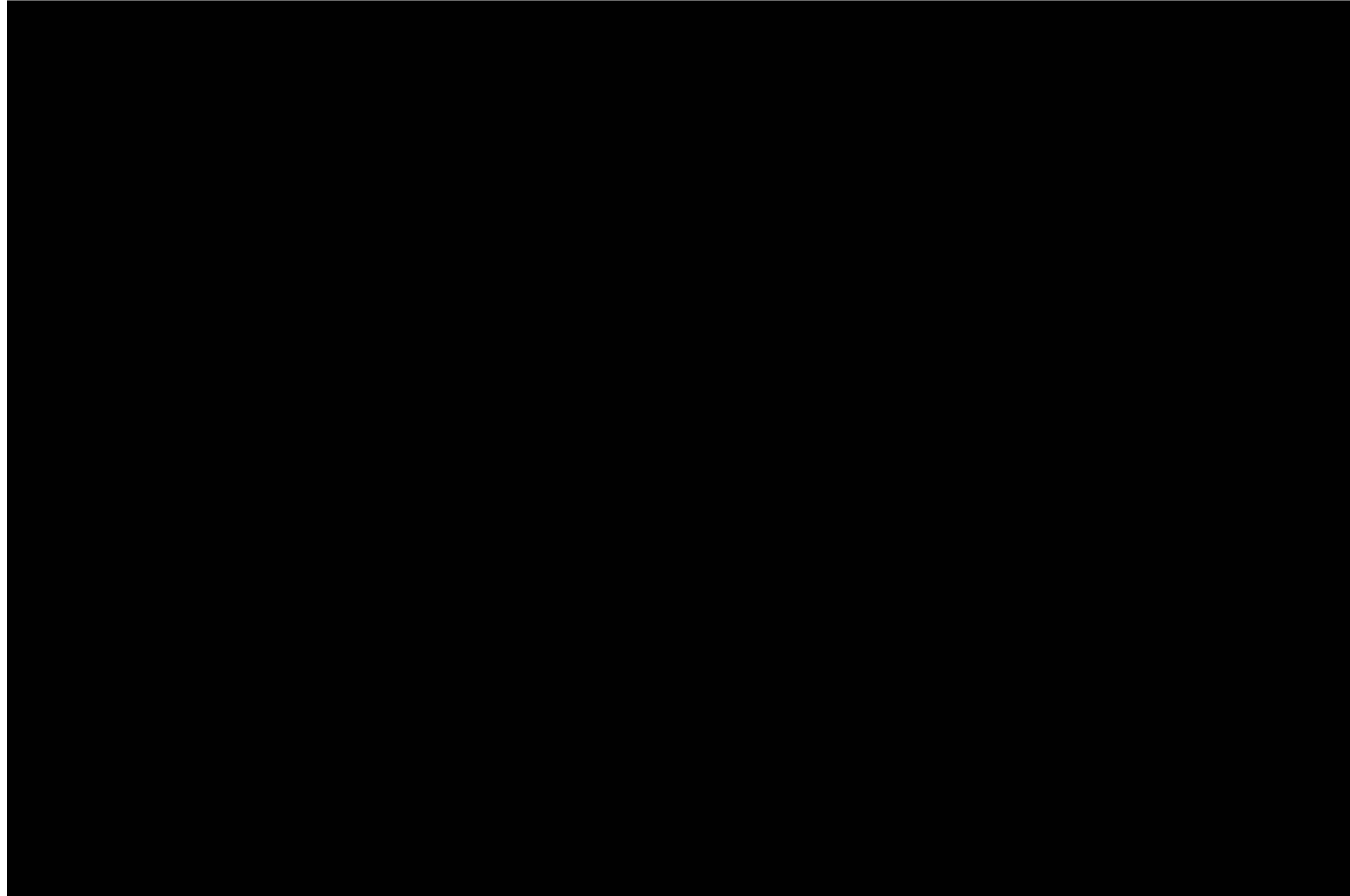
- Sustained tachycardia above 120
  - Acute shoulder pain (Kehr sign)
  - Abdominal pain / acute abdomen
  - Increased oxygen requirement
  - Fever, nausea
- High suspicion even in the absence of radiological finding

- CT-scan with oral contrast
  - PE- pneumonia – empyema
  - Abcess- hematoma



Specific consideration

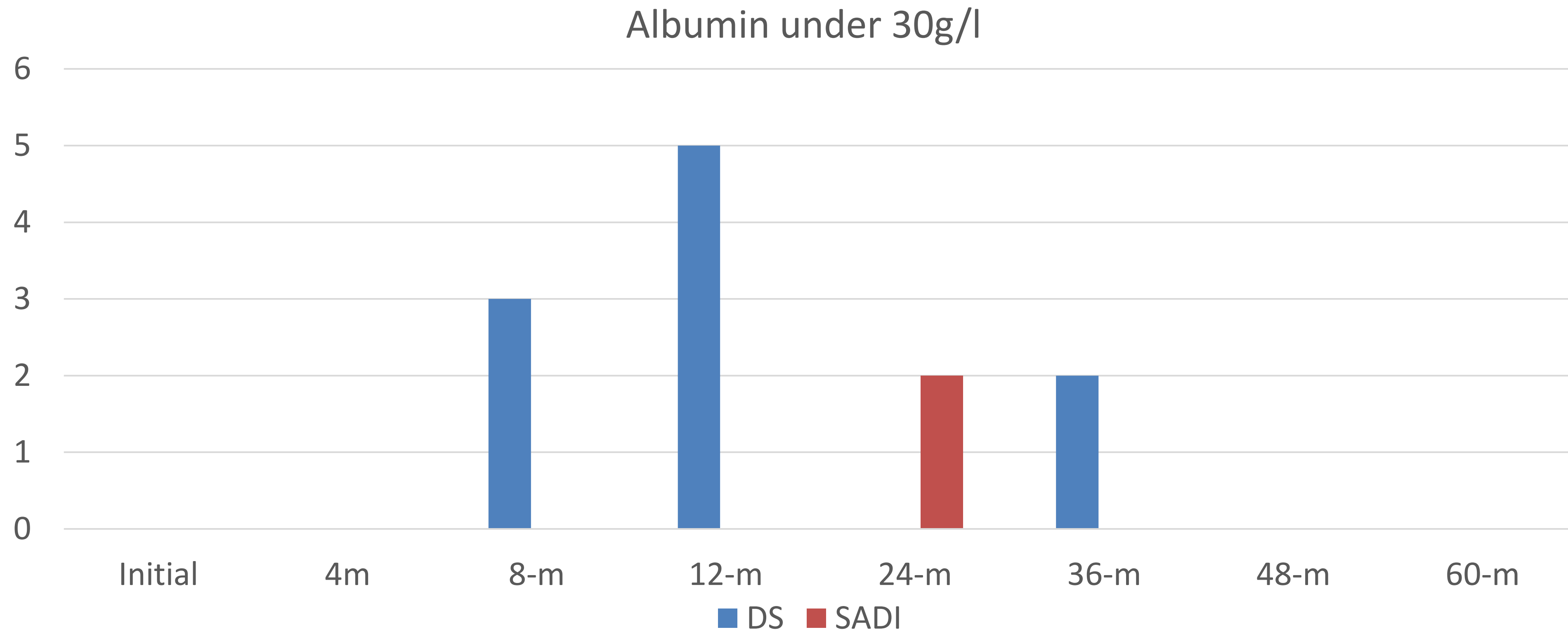
- Laparoscopic exploration
  - Intraoperative gastroscopy
    - R/O leak, stenosis, stent or feeding tube placement
  - Drainage
  - Omental patch +/- repair (<48h)
  - Nutrition
    - Feeding tube
    - Jejunostomy– Foley or Blake drain



Late complications

Protein-energy malnutrition

deficiency in all macronutrients



Symptoms and signs

Moderate PEM

- Apathy, irritability, impaired cognitive abilities
- Weakness and decreased exercise tolerance
- Lack of intestinal proteins (eg. Lactase) may lead to diarrhea
- Gonadal tissues atrophy, Amenorrhea, decreased libido
- Temporal, thenar and interosseous muscle wasting

Severe PEM

- Decreased cardiac output and heart rate
- Hypotension
- Hypothermia
- Respiratory rate and vital capacity decrease
- Edema, anemia, jaundice, petechiae

Diagnosis

- Diagnosis usually based on history and physical exam
  - Good assessment of dietary intake, including protein (dietary log)
  - Measure height/weight (BMI), inspect body fat distribution, anthropometric measurement of LBM, muscle strength
- Assess severity
  - BMI
  - Serum albumin, serum transferrin, prealbumin
  - CBC
  - K, Ca, Mg, PO_4
  - INR, vitamin levels (A, D)
  - TSH

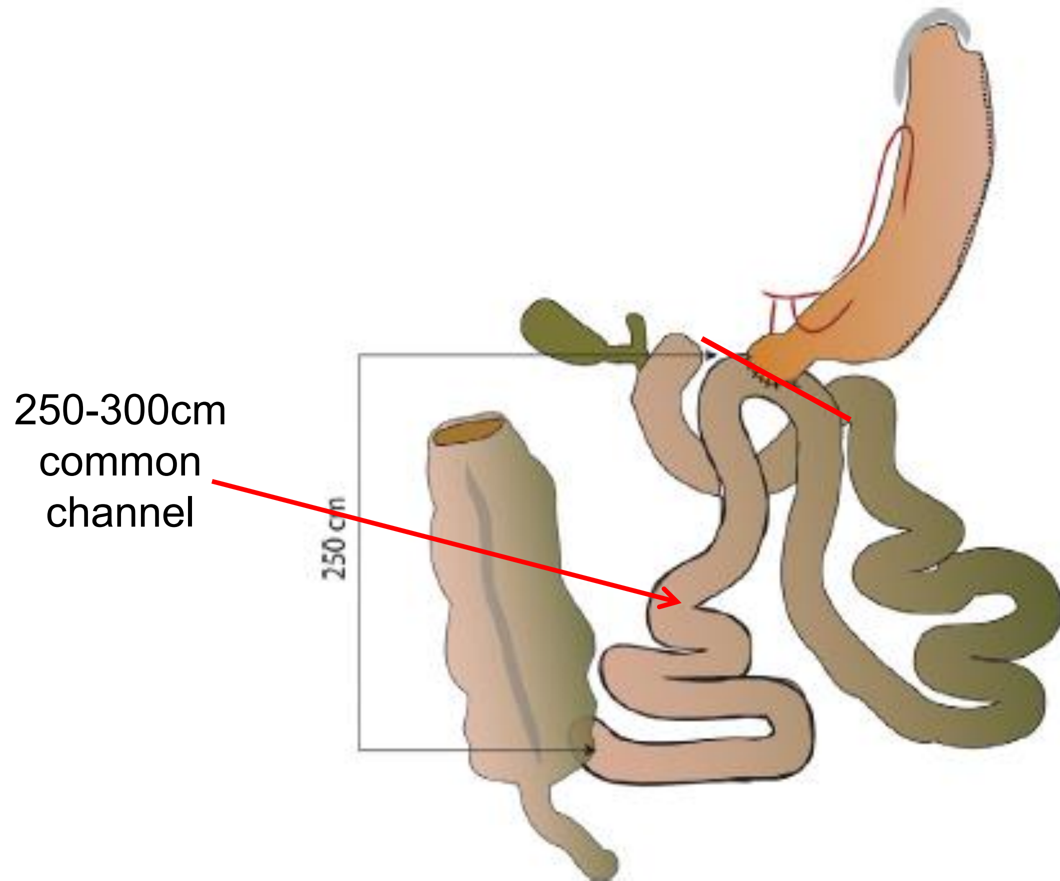
Management

- Mild protein malnutrition (30-35gr/L)
  - Outpatient treatment
  - Nutritional consult
  - Protein powder
    - Beneprotein, whey protein, 1 spoon (6gr) BID
  - Pancreatic enzymes
    - Viokace, 20.000 lipase, 78000 protease, 78000 amylase
  - Assess diarrhea

Management

- Moderate (<30gr/L) to severe (<25gr/L) protein malnutrition
  - Consider inpatient management
- IV albumin (25% BID until albumin >30gr/L)
- Vitamin B1 – 300mg IV ID x3
- Oligoelements and multivitamins – 1 vial ID
- Diuretics: Lasix 20mg -40mg PO or IV
- Enteral feeding tube – 2-3 months
- Bacterial overgrowth
  - Metronidazol 250-500mg TID x10d

Revision after SADI-S



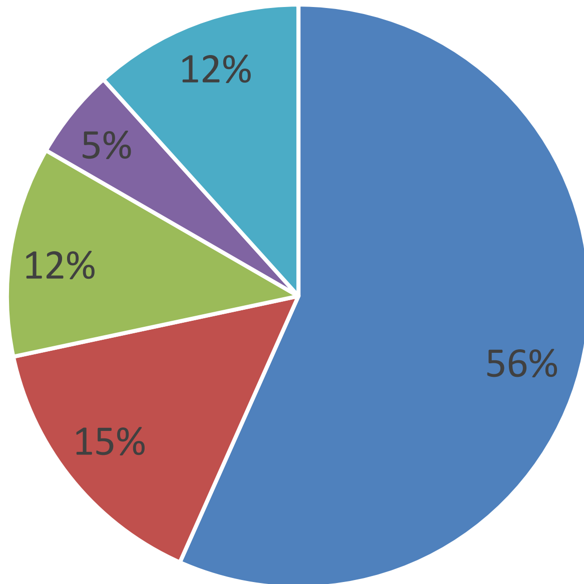
For PEM

Transection at DI anastomosis

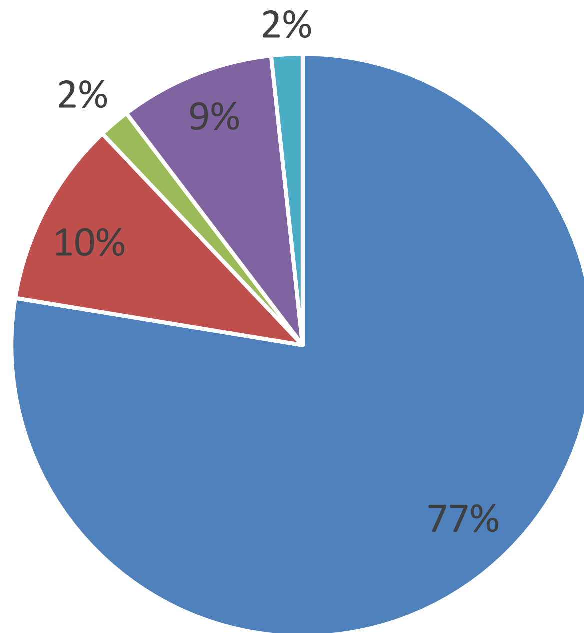
- Add 100 to 200cm
- Complete reversal - Duodeno-ileal anastomosis

GERD symptoms – SADI-S

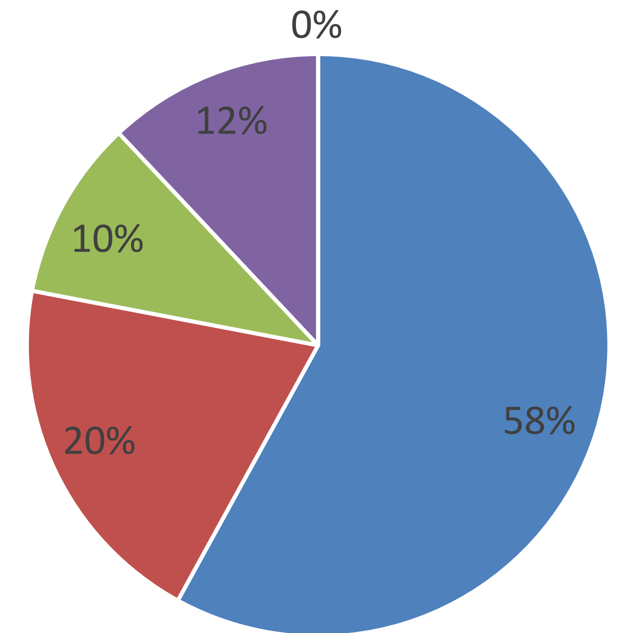
Baseline



24 months



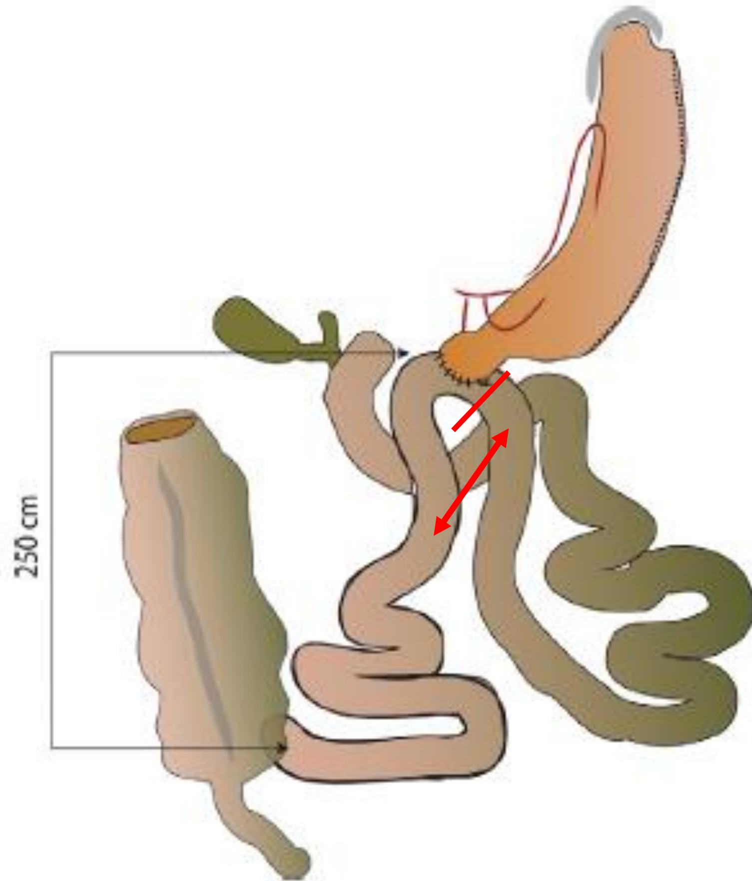
60 months



- Almost never
- Once a month
- Once a week
- More than once a week
- Daily

Symptoms ≤1/month
- Significant improvement at 2 Y ($p=0.02$)
- No change at 5 Yr ($p=0.3$)

Revision for GERD/gastritis after SADI-S <1%



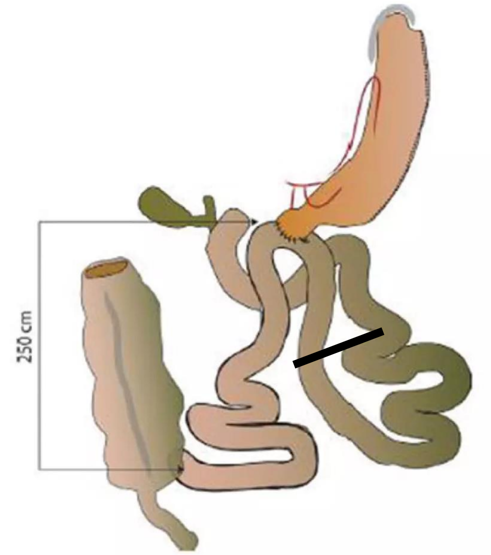
For biliary gastritis/reflux
Conversion to «long» DS – 50cm strict alimentary limb

Bowel obstruction/internal hernia

<1% after SADI

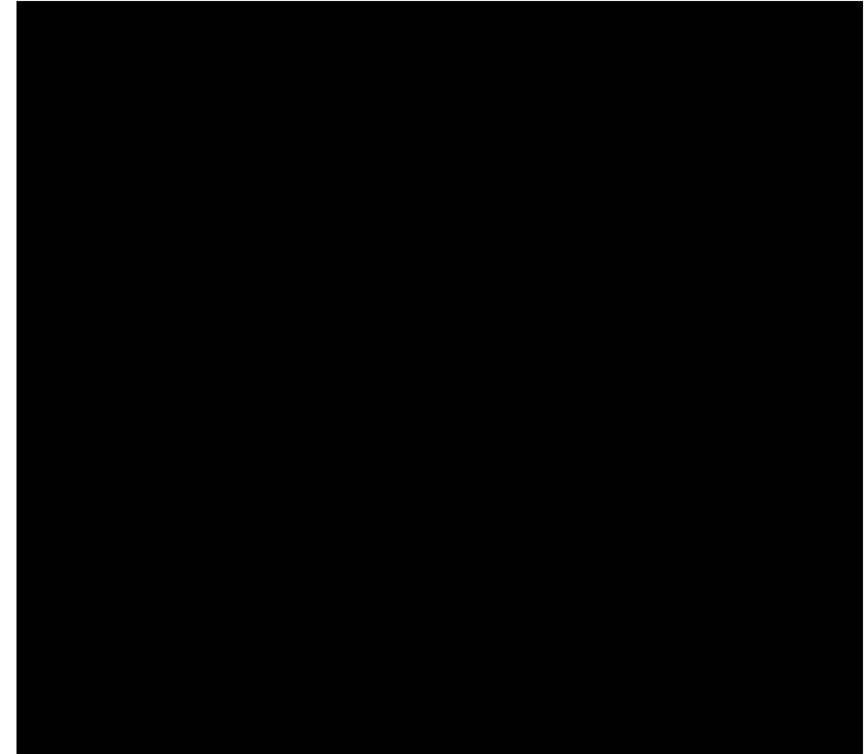
- > After standard DS
  - Open surgery > adhesion
  - Laproscopic surgery > internal hernia
  - Anastomotic kink
    - Unusual – abdominal pain

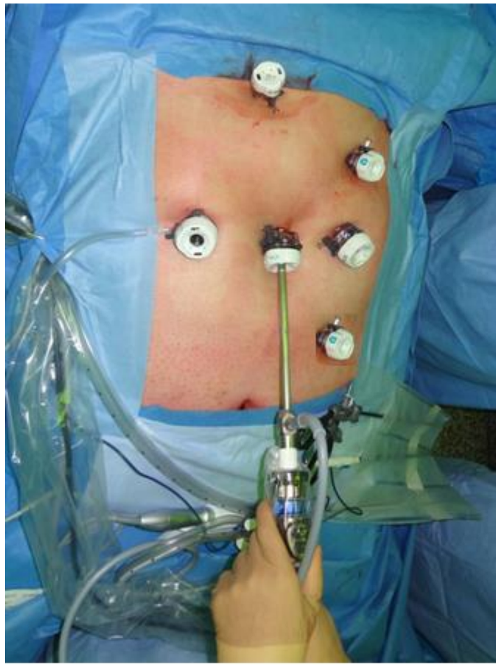
Biliary limb obstruction



- Closed loop
- Increased lipase – Liver enzymes
- No air-fluid levels on X-ray
- Misdiagnosed as pancreatitis

- CT-scan with IV and oral contrast
  - localisation of obstruction level
  - Potential bowel resection
  - Swirl sign – closed loop – Internal Hernia
- OR note
  - Limb lengths
  - Closure of Petersen defect
  - Intraop problems
  - Ventral hernia





Assistant

Surgeon

Conclusion

- Abdominal examination can be less reliable in patients with obesity
- Most early complications come from the sleeve component
- Signs of gravity
  - Tachycardia (>120)
  - Kehr sign
  - Acute abdominal pain
- > Rule-out a complication
  - Leak, hematoma or portal thrombosis
  - Small bowel obstruction - volvulus

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- Long-term complication - PEM
  - Long-term nutritional workup
  - Most nutritional deficencies will resolve with counselling and treatment
  - Increase common limb along the biliary limb if needed

- Abdominal pain with increased pancreatic enzymes
  - > Biliary limb obstruction
  - CT scan to diagnose SBO after bariatric surgery
- Acute or recurrent abdominal pain
  - Diagnostic laparoscopy to r/o an internal hernia

Thank you!