Bariatrics in Liver Transplantation

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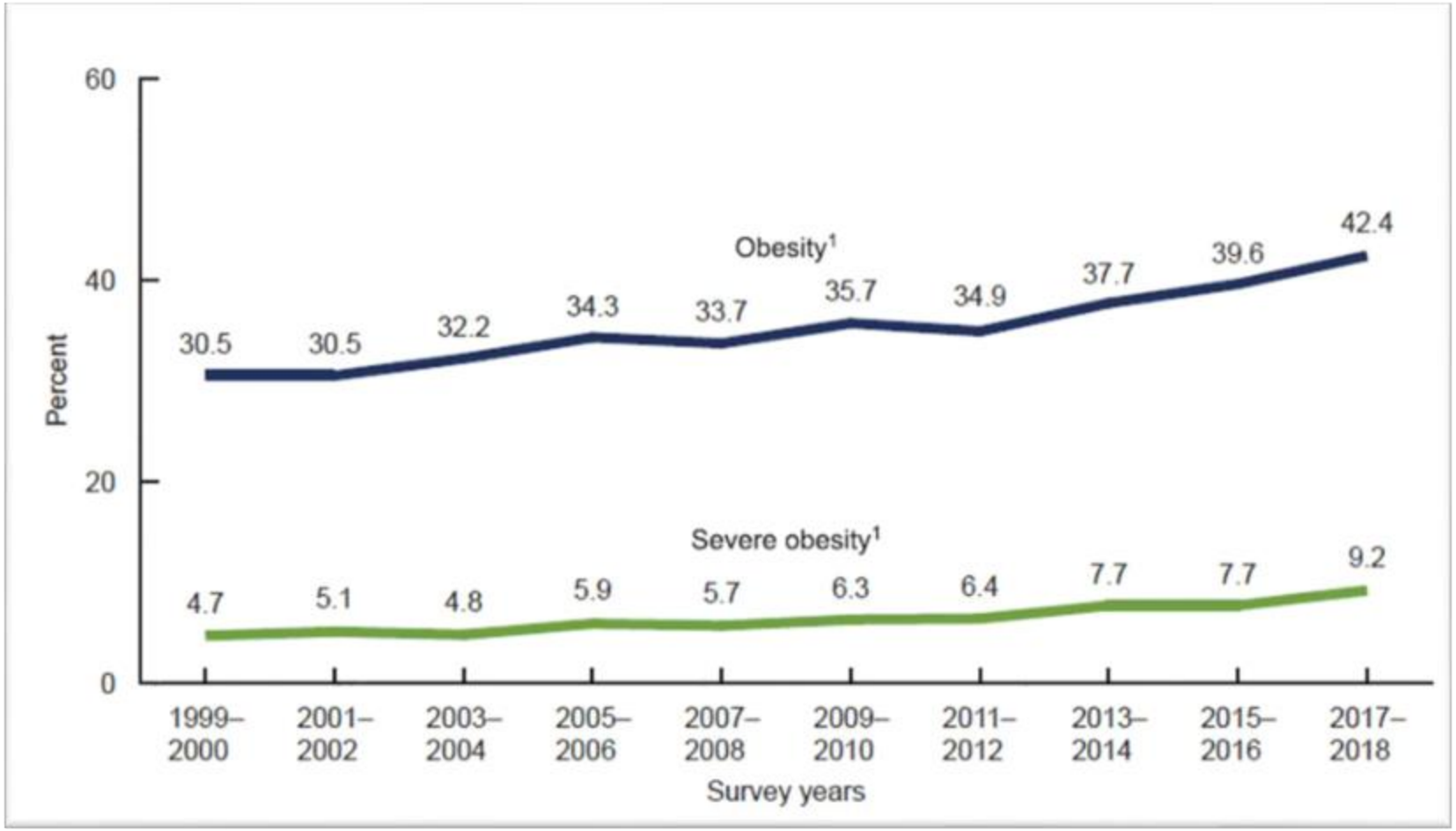
Disclosures

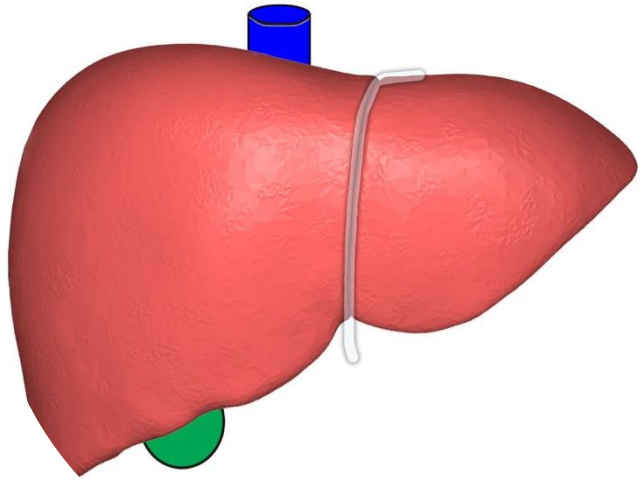
- No financial disclosures

- Transplant Surgeon

Obesity in adults in the US



Obesity and Liver Transplantation



Indications for Transplant

- MASLD
- HCC
- ALD

Comorbidities Impacting Candidacy

- Cardiac
- Diabetes
- Frailty, Malnutrition, Sarcopenia

Impact on Outcomes

- Waitlist Mortality
- Surgical Complications
- Long-term Survival

Obesity Interventions:

Lifestyle

Pharmacologic

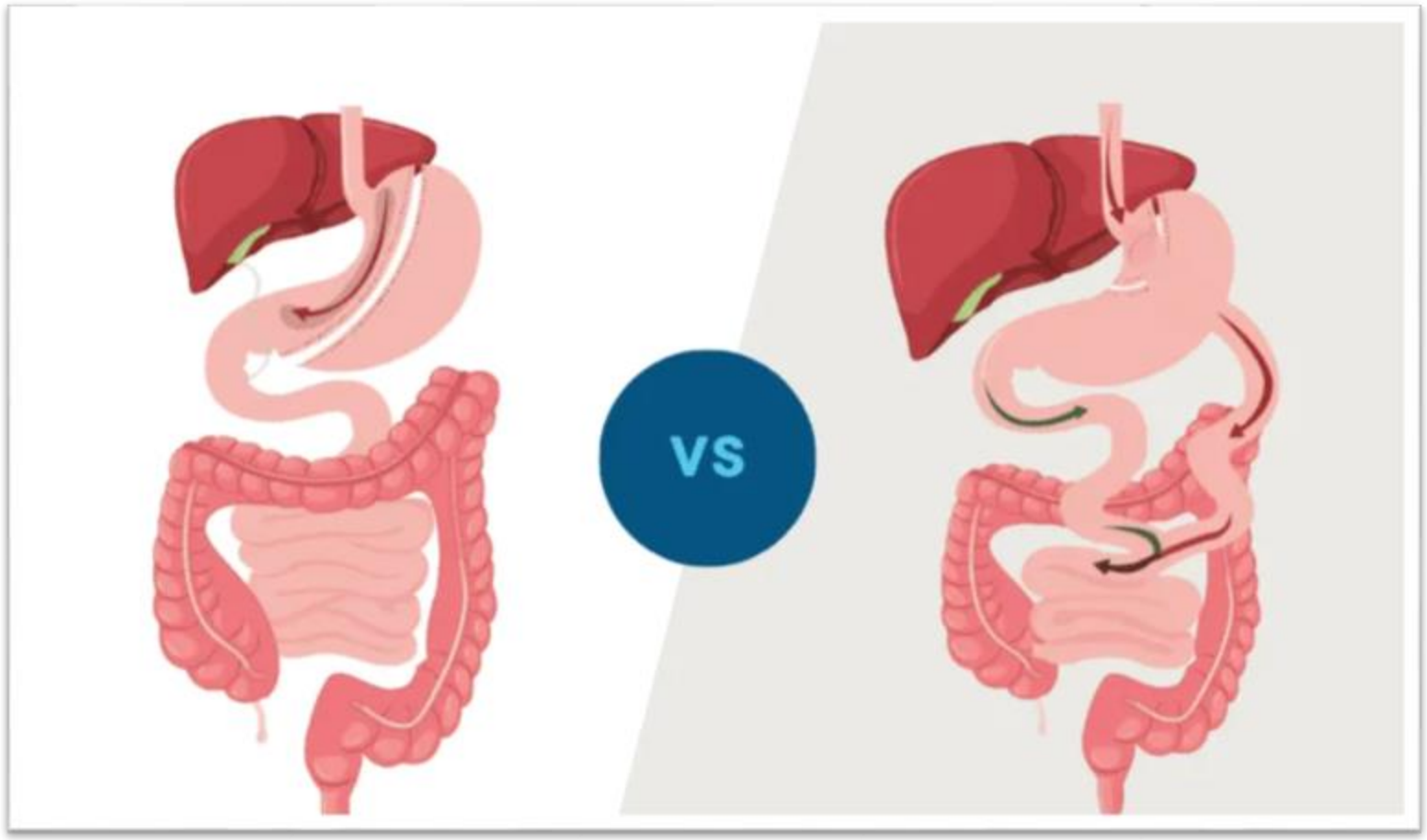
Surgical

Restrictive

Hypoabsorptive

Endocrine

Obesity Surgery: Options



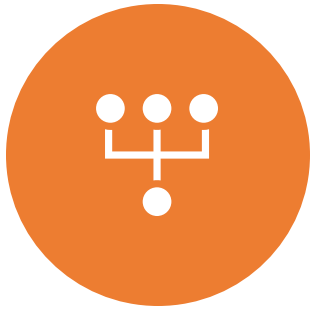
Gastric Sleeve

- Restrictive
- Endocrine

Gastric Bypass

- Restrictive
- Hypoabsorptive
- Endocrine

Bariatrics and Liver Transplant: Considerations



What is the best procedure?

Who benefits?

What is the optimal timing?

What are the outcomes?

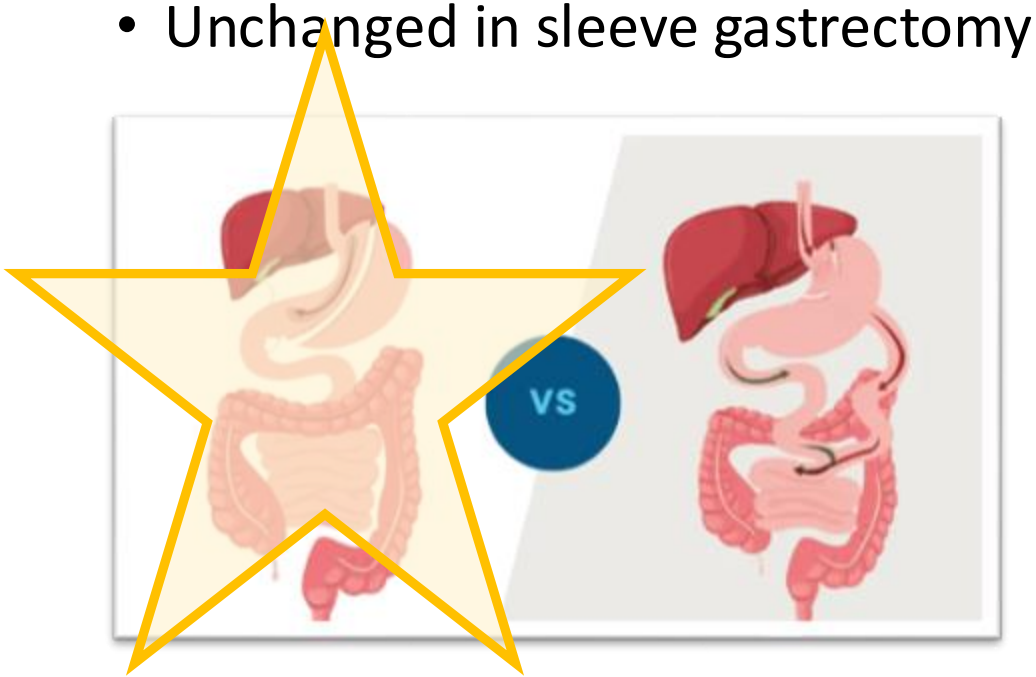
Procedure Choice: Immunosuppression

- Most immunosuppressants absorbed in the small intestine (7)
- In metabolic operations that include a hypoabsorptive mechanism, higher doses of tacrolimus, cyclosporine, and mycophenolate mofetil *may* be needed (5, 10)
  - Roux-en-Y gastric bypass, duodenal switch, biliopancreatic diversion, etc
- Sleeve gastrectomy does not cause malabsorption or alter the small intestine –> no alternations in immunosuppression needed (8)
- No data to suggest increased rejection in transplant recipients with history of bariatric procedures (5, 11)

Procedure Choice: Biliary Considerations

Access to the Biliary Tree

- Limited in any malabsorptive procedure
- Unchanged in sleeve gastrectomy



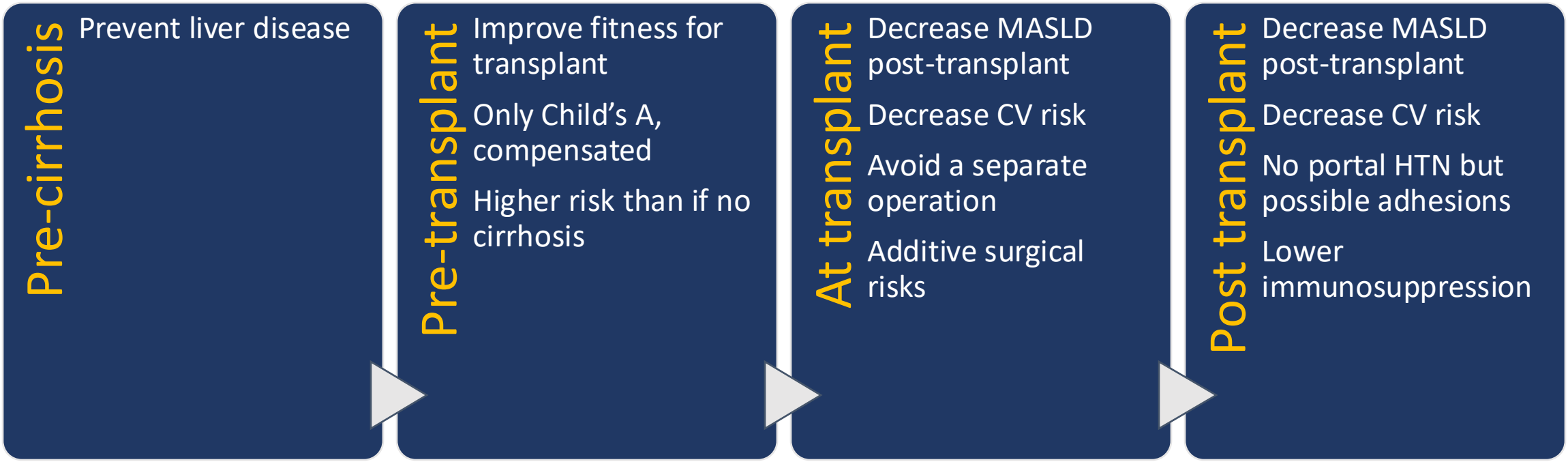
Transplant Biliary Reconstruction

- Complex in any malabsorptive procedure, options may be limited
- Unaffected by sleeve gastrectomy, all options preserved

Outcomes:

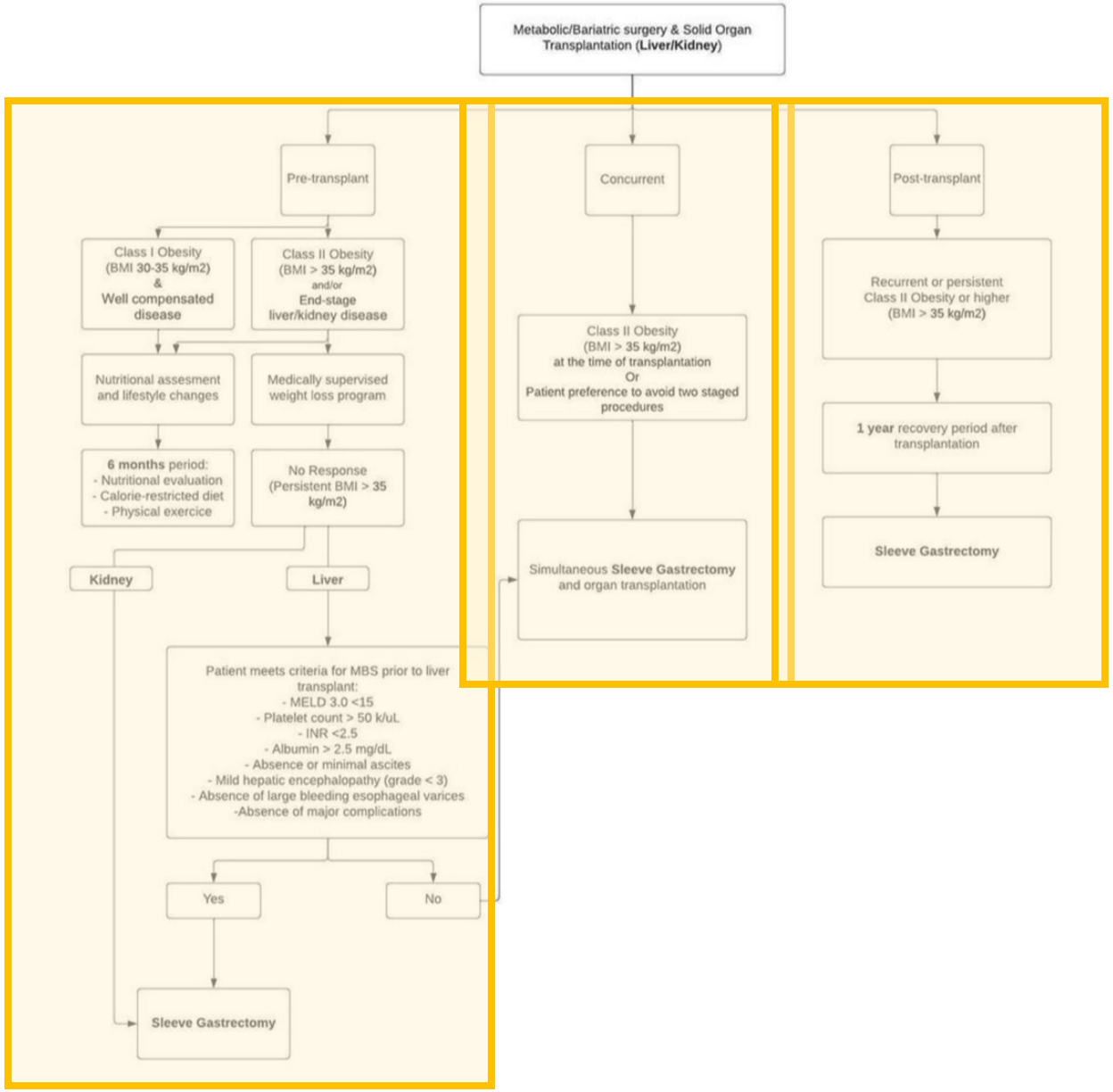
- Bypass: Greater weight loss
- Sleeve: Fewer complications

Timing of Bariatric Surgery



Liver Transplant and Bariatrics: Algorithm

ASTS and SAGES

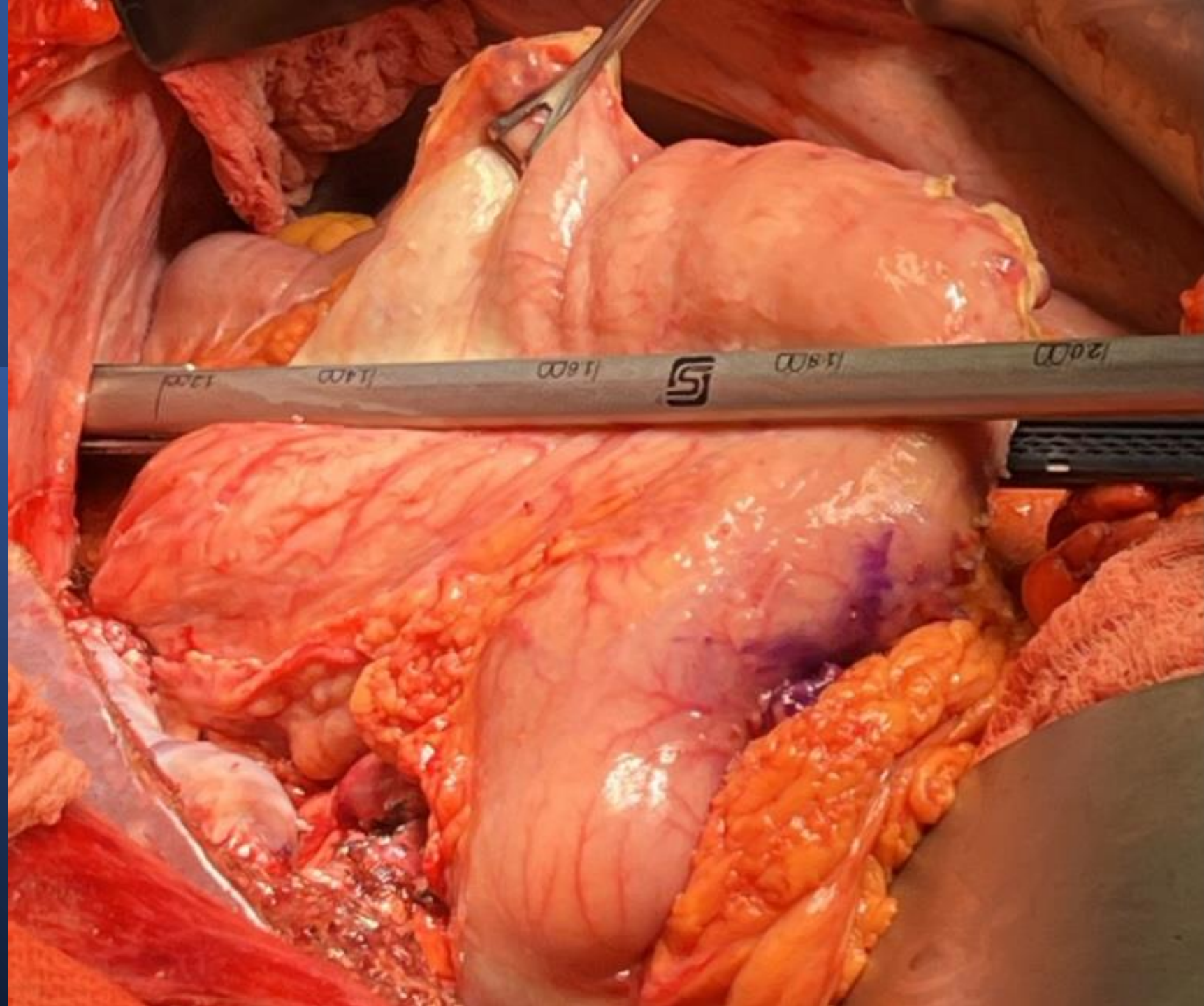


American Journal of Transplantation 24 (2024) 1534–1546

Combined Liver Txp and Sleeve Gastrectomy

- UH Transplant Institute Criteria for combined Living Donor Liver Transplant and Sleeve Gastrectomy:
  - <70 yo
  - BMI >40
  - BMI >35 + 2 comorbidities
  - BMI >30 + uncontrolled DM
  - No prior bariatric procedures
  - No severe GERD
- Overlapping evaluation process:
  - Medical acceptability
  - Anatomic suitability
  - Ability to follow a complex medical regimen
  - Psychosocial factors, social support
  - Patient preference
- Education as a critical component of evaluation

Liver Transplant: Bariatrics: Combined Procedure



Pt referred for LT, BMI >35

- Enrolled in non-surgical weight loss program
- IF unsuccessful, then sleeve at the time of transplant
  - 1 Leak, 1 excess weight loss, 1 Rejection
  - No graft loss or death

Medically supervised weight loss program vs. bariatric surgery: Mayo

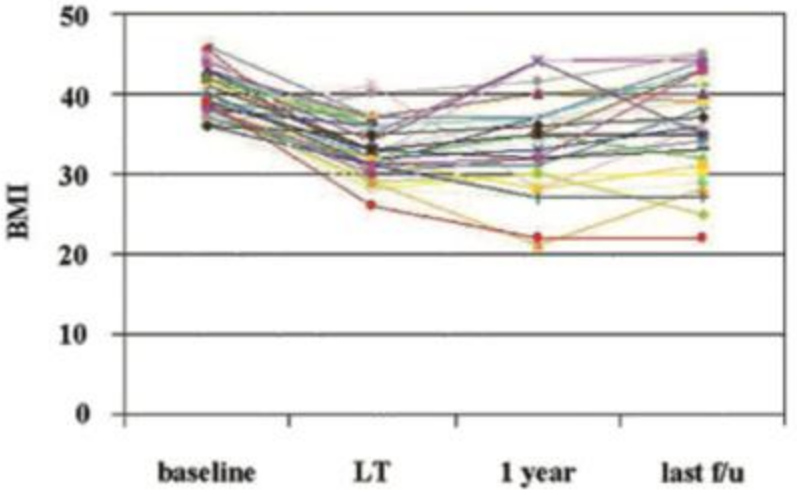


Figure 1: BMI trends for 37 patients managed in the noninvasive pre-LT weight loss program. Mean follow-up is 33 months.

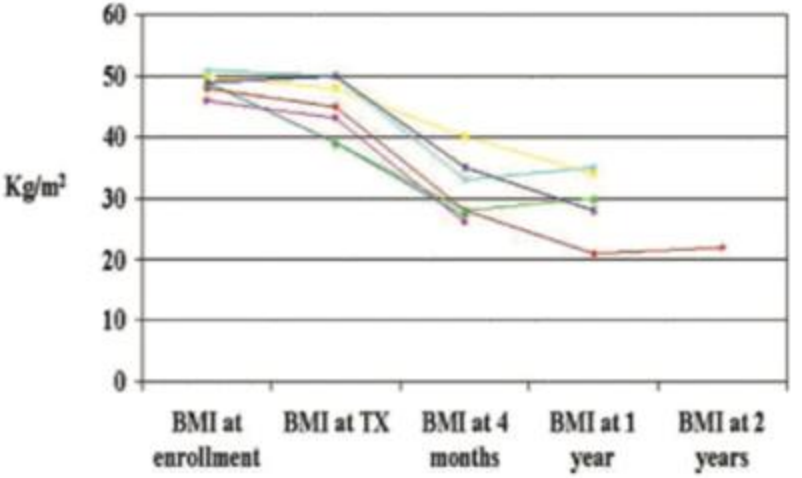
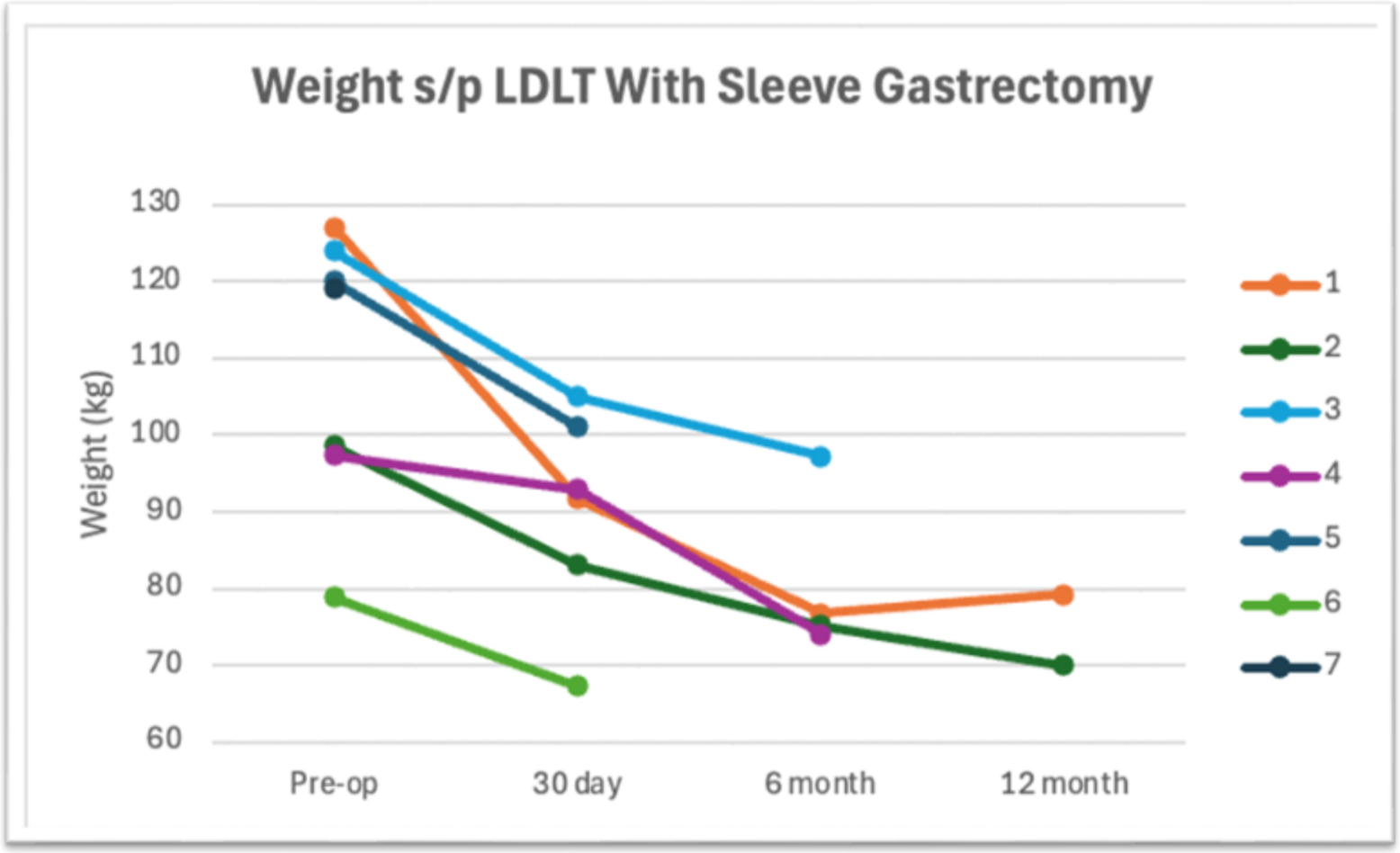


Figure 2: BMI trends for those patients who underwent combined liver transplant plus sleeve gastrectomy (N = 7). Mean follow-up is 17 months.

American Journal of Transplantation 2013; 13: 363–368

Combined Liver Txp & Sleeve Gastrectomy: Outcomes



At 6 months post-op

- 27% weight lost (mean)
- 100% off DM meds
- 50% off HTN meds

44 yo woman, BMI 52 with DM and OSA

PCP Management

- Multiple lifestyle interventions ineffective
- Did not tolerate GLP1 agonist
- PCP refers to bariatric surgeon

Risk of Obesity, Metabolic Syndrome

- Development MASLD
- Development of cardiovascular and other comorbidities

44 yo woman, BMI 52 with DM and OSA

Bariatric surgery evaluation

- CT scan: cirrhosis
- Hepatology: Compensated, MELD 8 Child's A, nl platelets, nl bili
- Non-surgical weight loss plan, bariatric diet
- Loses 8 kg → BMI 49, plateau

- Plan for minimally invasive sleeve gastrectomy
  - 2-5% risk of major surgical complication or adverse liver event
  - Lower risk without cirrhosis

Obesity + cirrhosis

- Risk for progression of liver dz
- Risk for synergy with alcohol
- 5X higher HCC risk than non-obese patients with cirrhosis

Bariatric surgery pre-liver transplant

- Decreases risk liver dz progression
- Decreases risk of CV comorbidity
- Subsequent liver transplant:
  - Decreases waitlist mortality
  - Decreases transplant complications
  - Decreases MASLD recurrence

44 yo woman, BMI 52 with DM and OSA

Decompensation

- Pt shows up to pre-op visit visibly jaundiced, MELD 24
- Case cancelled
- Hepatology refers for transplant
- Combined bariatric and transplant evaluation

Liver Transplant + Obesity

- Increased complication risk:
  - Infectious, cardiac, wound healing
- Risk of recurrent MASLD, ESLD, Re-transplant
- Risk of long-term CV mortality
- Option for post- transplant sleeve

Liver Transplant + Sleeve

- Improvement, resolution of metabolic syndrome
- Presumed:
  - Decreased risk of MASLD, ESLD, Re-transplant
  - Decreased risk of long-term CV mortality
- Leak rate: 1-2%
- No change to immunosuppression

Conclusions

- Obesity has significant consequences in transplant candidates and recipients including
  - Increased risk of HCC
  - Increased wait list mortality
  - Increased risk of surgical complications
  - Increased risk of cardiovascular mortality

- Bariatric surgery, particularly sleeve gastrectomy, can be safely applied to well-selected patients with cirrhosis pre-transplant, at the time of transplant, or post-transplant.