



## Obesity surgery in MAFLD : call for a liver transplant?

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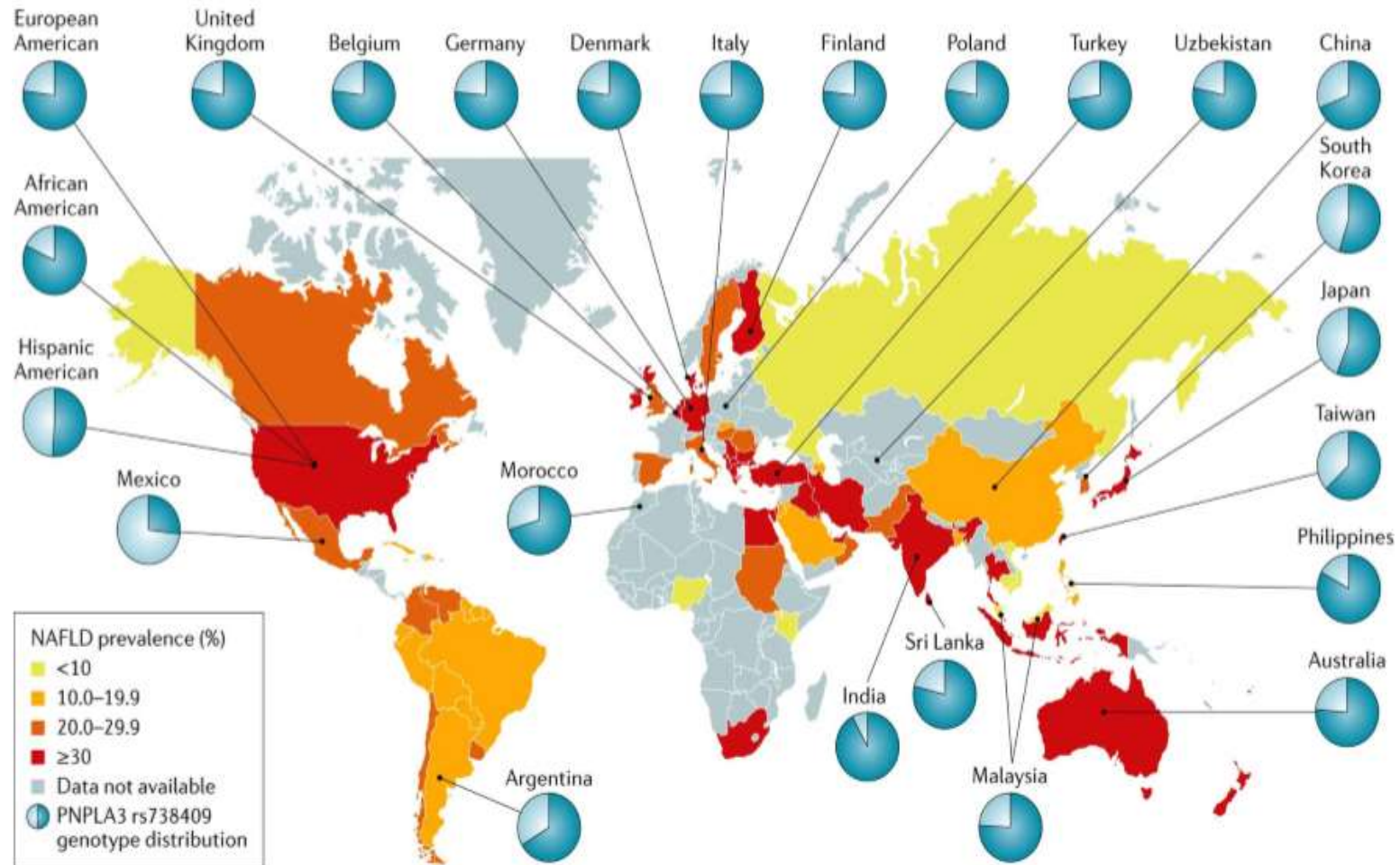


In accordance with «EACCME criteria for the Accreditation of Live Educational Events»,

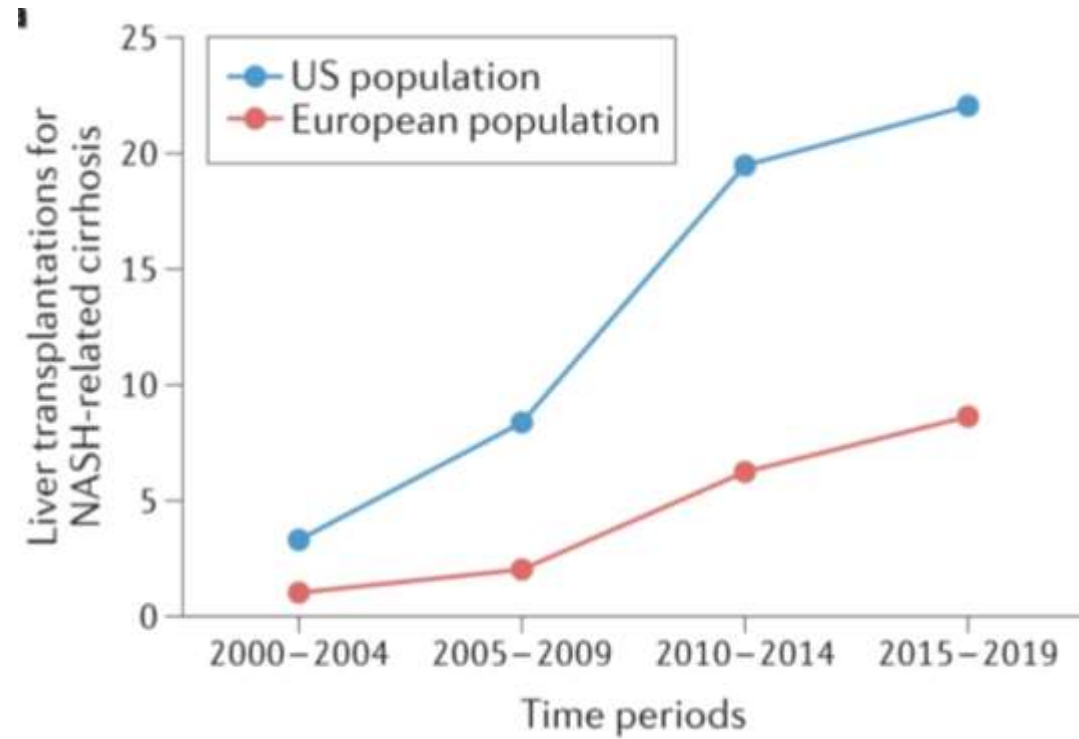
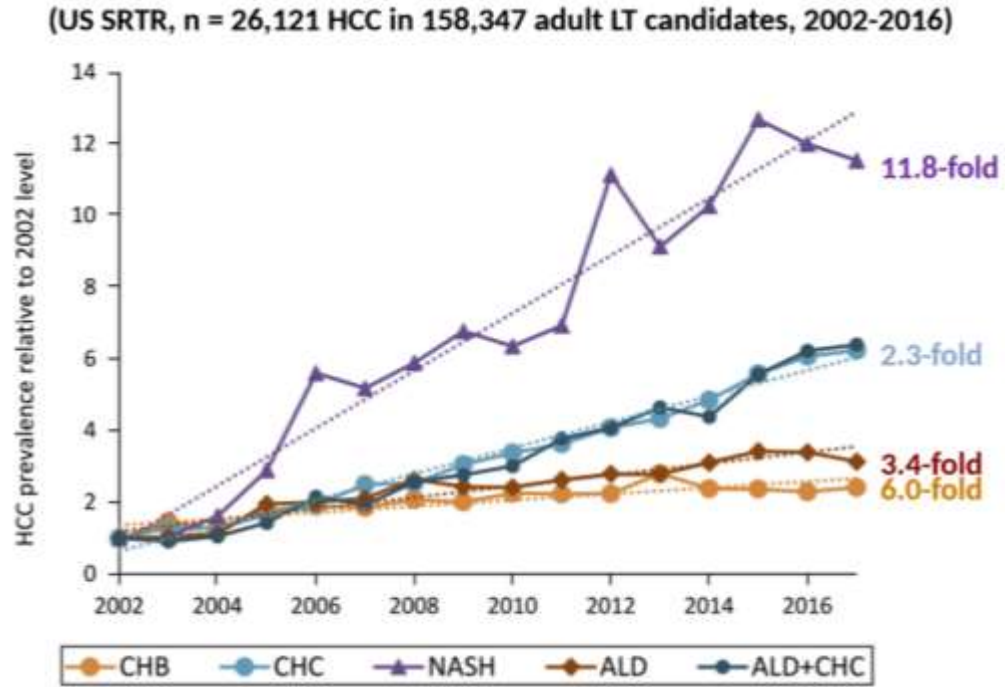
**[x] I have the following potential conflict(s) of interest to report:**

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- Receipt of grants/research supports: Gilead, Abbvie, Inventiva
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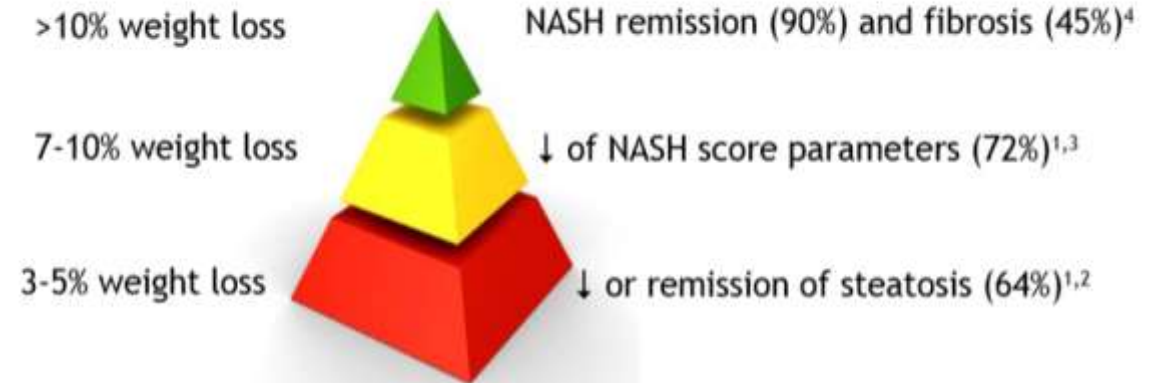
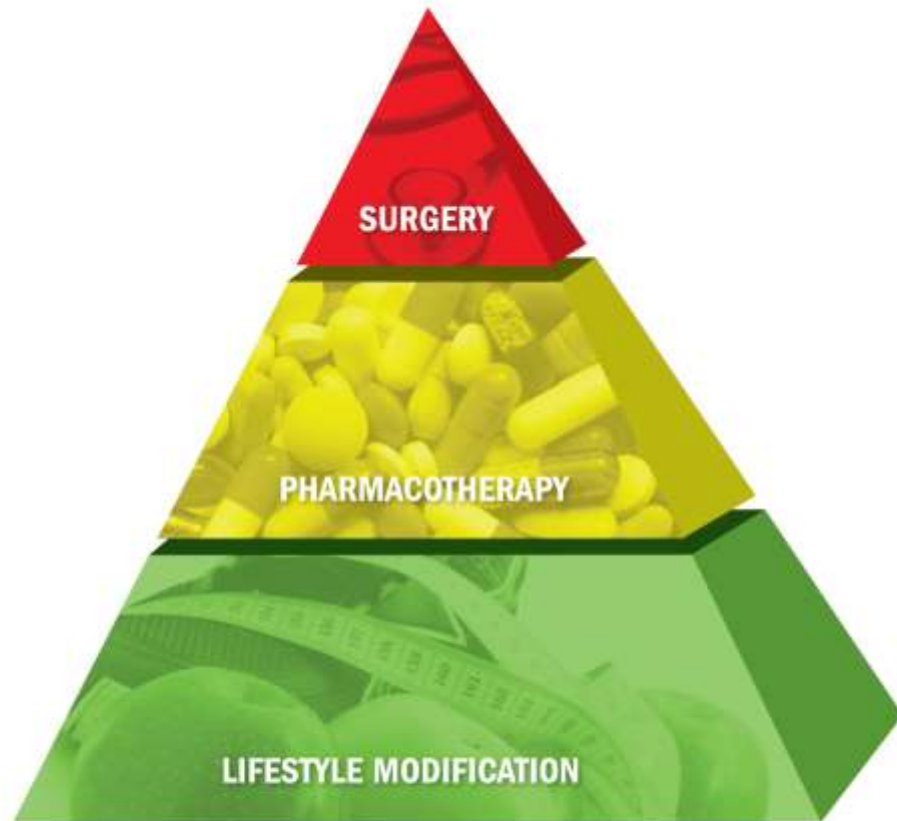
## MAFLD affects one quarter of the global population



## MASH is the fastest growing cause of HCC in liver transplant candidates



## Weight loss: the cornerstone of the treatment for MAFLD

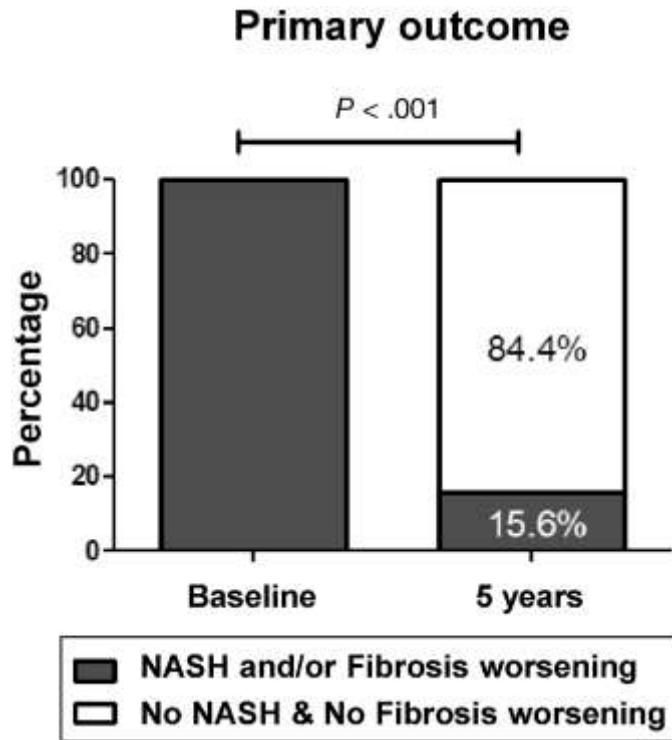


1. Harrison et al. *Hepatology* 2009; 2. Wong et al. *JHepatol.* 2013

3. Promrat et al. *Hepatology* 2010; 4. Vilar-Gomez et al. *Gastroenterology* 2015

Life-style modification works well... but hard to achieve..

## Positive impact of bariatric surgery on MASH long term



Lassailly et al. Gastroenterology 2020

- ▶ Lower risk (CI) of major liver outcomes at 10 years of 2.3% in the BS group versus 9.6% in the nonsurgical group. Regarding major adverse cardiac events, CI at 10 years was 8.5% in the bariatric surgery group and 15.7% in the nonsurgical group (Aminian et al JAMA 2021;23:2031-2042).
- ▶ Bariatric-metabolic surgery versus lifestyle intervention plus best medical care in non-alcoholic steatohepatitis (BRAVES): a multicentre, open-label, randomised trial (Verrastro O et al. Lancet 2023; 401: 1786-97)



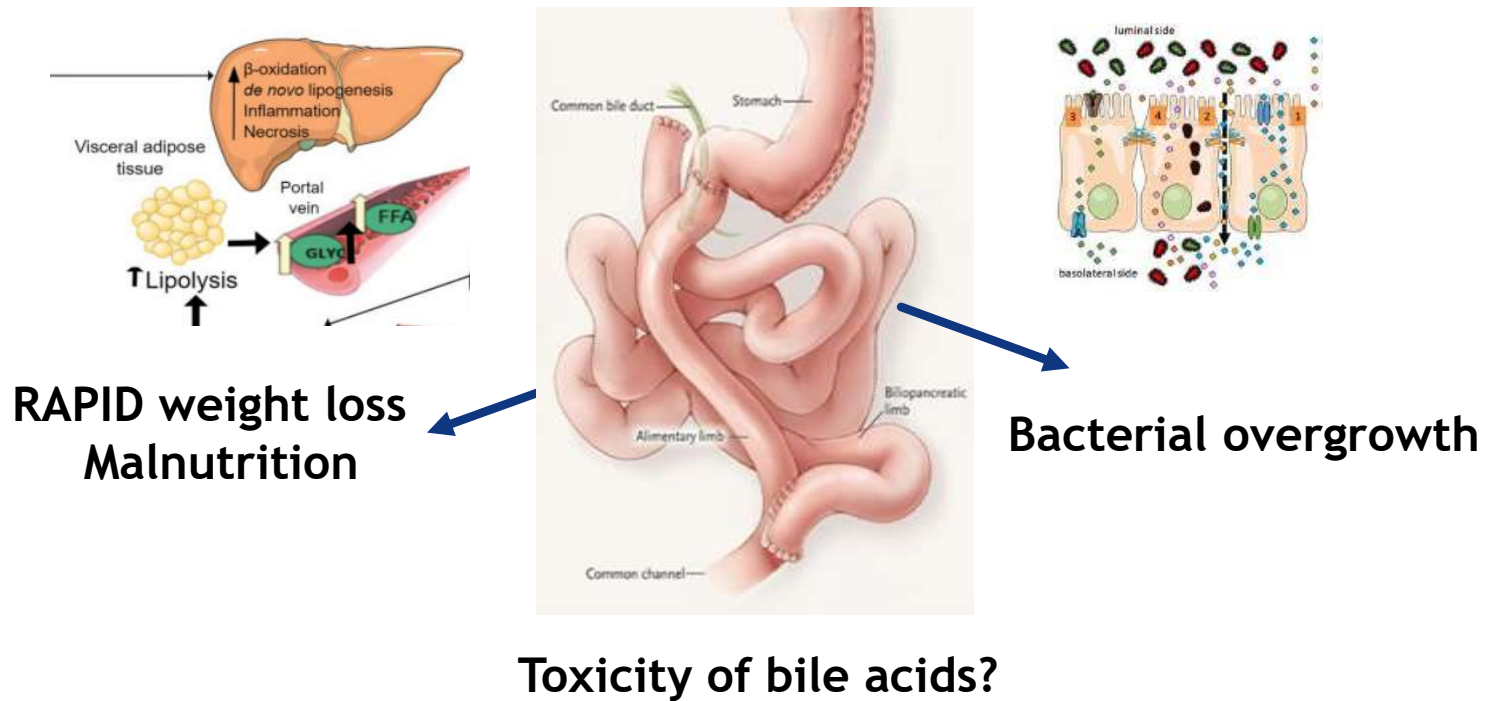
## Positive impact of bariatric surgery on MAFLD long term

Potential indications for bariatric surgery in NASH patients

Indication	Recommend surgical method	Expected improvement
Obese patients (BMI $\geq 35$ kg/m <sup>2</sup> ) with NASH fibrosis and comorbidities, or obese patients with NASH fibrosis who otherwise meet BS criteria (BMI $>40$ kg/m <sup>2</sup> )	RYGB or SG	<ul style="list-style-type: none"> <li>-Significant lower risk for major adverse liver and cardiac events [32]</li> <li>-Resolution of steatosis (from 66 to 88%)</li> <li>-Resolution of inflammation and ballooning (from 50 to 84%)</li> <li>-Resolution of fibrosis (from 40 to 68%) [26-31]</li> </ul>
NASH cirrhosis and no significant portal hypertension (HVPG $<10$ mmHg)	SG	<ul style="list-style-type: none"> <li>-Prevention of decompensation [36]</li> <li>-Improvement of liver transplant candidacy [45]</li> <li>-Increased survival after liver transplantation [47]</li> </ul>
Liver transplant recipients with obesity and NAFLD or NASH	SG	<ul style="list-style-type: none"> <li>-Prevention of recurrence of NASH and fibrosis progression [50,51]</li> <li>-Improvement of metabolic risk factors with better graft survival</li> </ul>



## Negative impact of bariatric surgery on liver function: need for liver transplant?



- ▶ Malnutrition
  - ▶ Rapid weight loss and delivery of fat to the liver
  - ▶ Small intestinal bacterial overgrowth
    - ▶ Long excluded limb
    - ▶ Dysmotility
    - ▶ Decreased gastric acidity
    - ▶ Protein deficiency - malnutrition
    - ▶ Undigested food reaching the colon
- > mucosal injury, increased gut permeability -> endotoxin absorption



## Bariatric surgery and liver failure

### The Multicenter Belgian Survey on Liver Transplantation for Hepatocellular Failure after Bariatric Surgery

A. Geerts, T. Darius, T. Chapelle, G. Roeyen, S. Francque, L. Libbrecht, F. Nevens, J. Pirenne, and R. Troisi

**Table 1. Characteristics of Patient Population Developing Liver Failure after BPD**

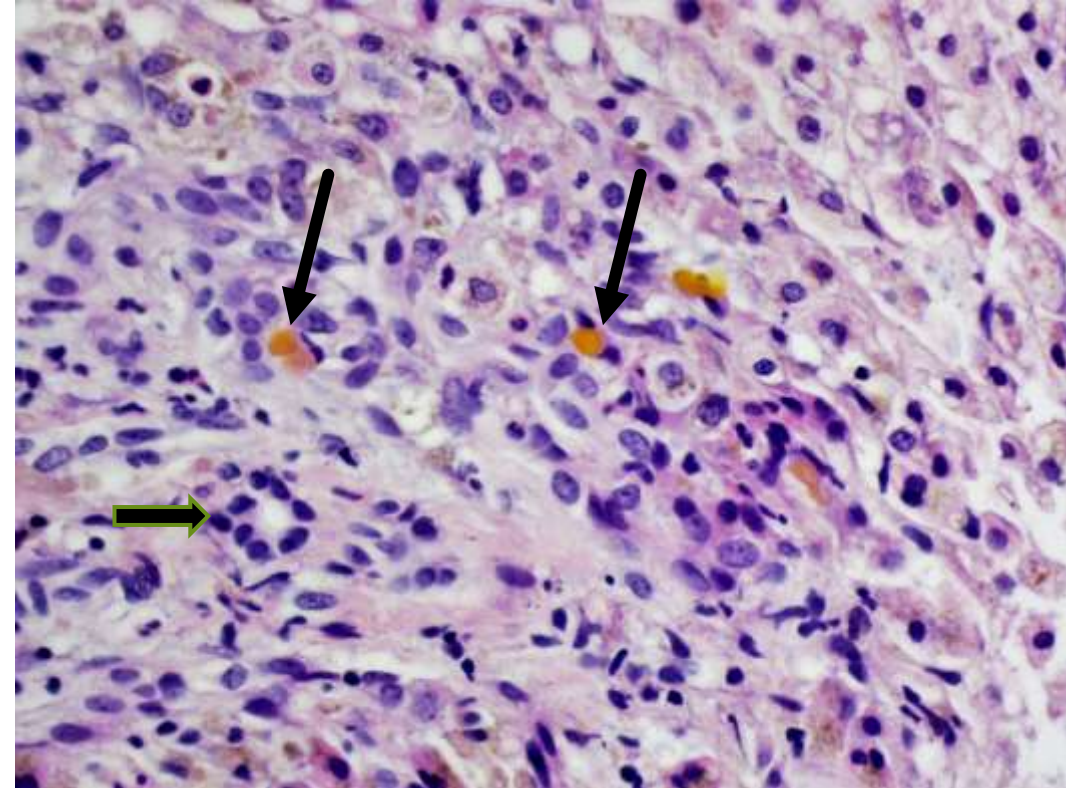
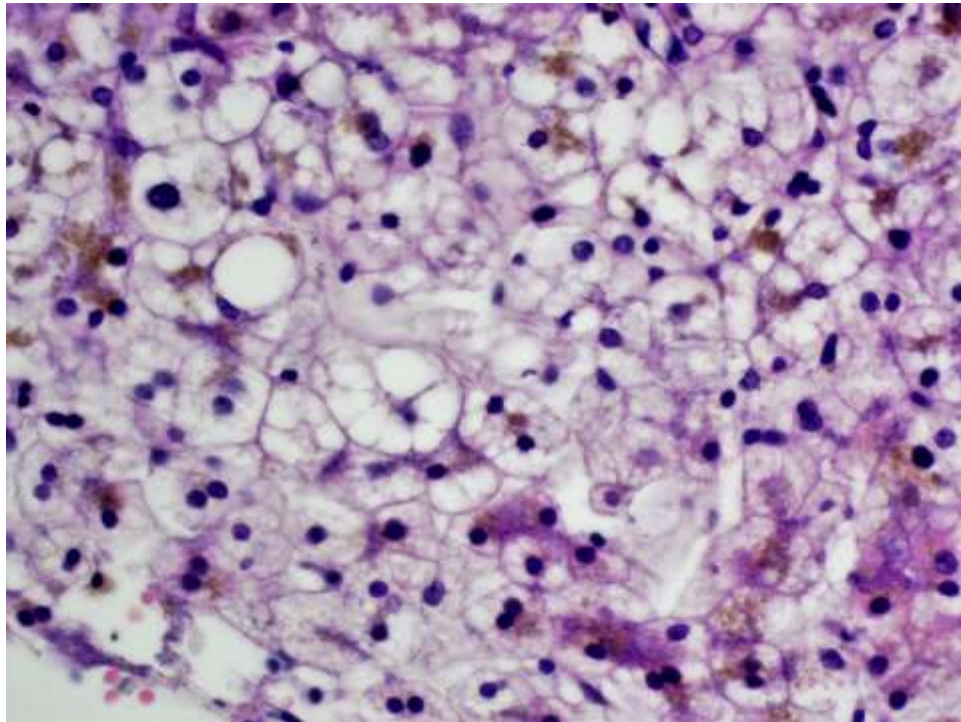
Patient	1	2	3	4	5	6	7	8	9
Gender	Female	Male	Female	Female	Female	Female	Female	Female	Female
Age (y)	52	38	29	19	46	53	35	38	40
Year of BPD	2000	2003	1998	2003	1997	2001	1999	1987	1994
Initial BMI	65	48	40	41	55	40	45	40	47
Post-BPD BMI	41	23	20	20	29	24	25	22	25
Maximum weight loss (kg)	88	88	60	47	55	40	45	53	50
Onset of LF after BPD (mo)	13	27	84	62	11	18	20	21	14
Time of OLT after BPD (mo)	22	85	listed	65	11	18	21	Died on list	Died on list
Waiting time on list (mo)	3	9	listed	3	2	2d	1	Died on list	Died on list
Time of BPD reversal	OLT	OLT	—	8 wk after OLT	OLT	OLT	OLT	—	—

Abbreviations: BPD, biliopancreatic diversion; BMI, body-mass index (kg/m<sup>2</sup>); LF, liver failure; OLT, orthotopic liver transplantation.

*Transplantation Proceedings*, 42, 4395–4398 (2010)

## Refractory subacute steatohepatitis after biliopancreatic diversion

Lefere, Sander\*; Hoorens, Anne; Raevens, Sarah; Troisi, Roberto; Verhelst, Xavier; Van Vlierberghe, Hans; Geerts, Anja\*



## Bariatric surgery and liver failure after RYGB?

### Case reports

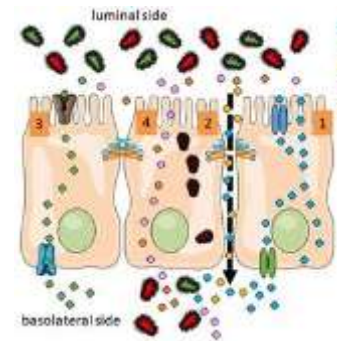
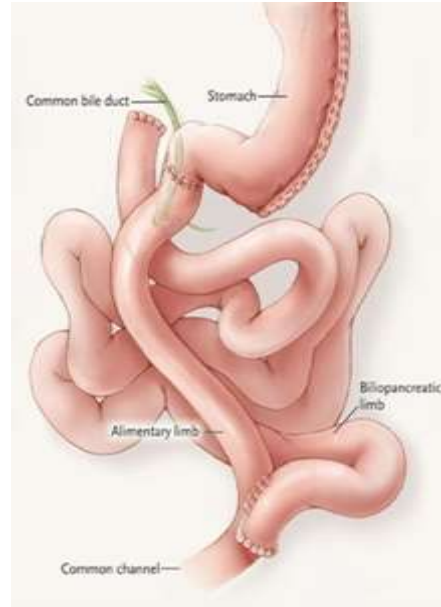
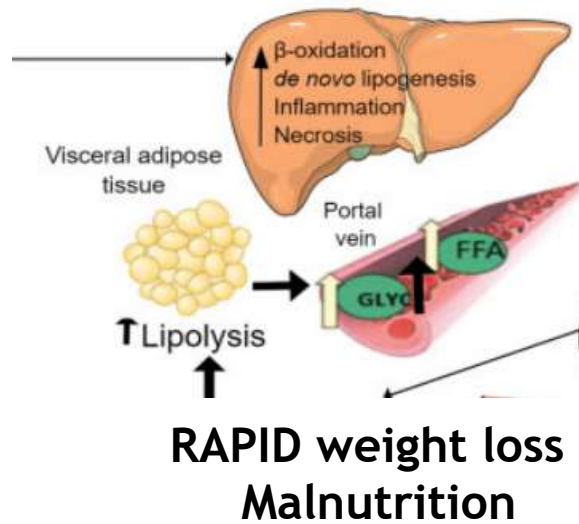
- ▶  Cirrotic patients (Mahawar et al. Obes Surg 2016)
- ▶  Extended limb or distal versions of RYGB with higher potential for malabsorption like BPD surgery
- ▶ Rapid weight loss (Van Golen et al Case Rep Gastroenter 2022) : 7 months after RYGB, loss of 40 kg. Progressive jaundice, biopsy: nodular aspect, ductular reaction. Need for liverTX

Case reports of liver failure after one-anastomosis (mini) gastric bypass (OAGB) (Van Golen et al Case Rep Gastroenter 2022) : progressive jaundice 6 months after BS, redo procedure by lengthening the common loop





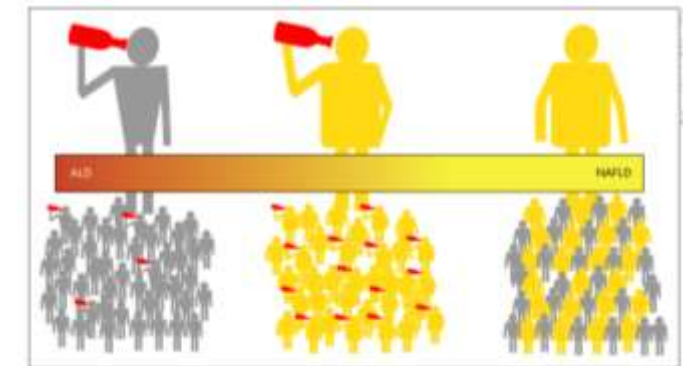
# Negative impact of bariatric surgery on liver function: need for liver transplant?



Bacterial overgrowth



Alcohol use disorder

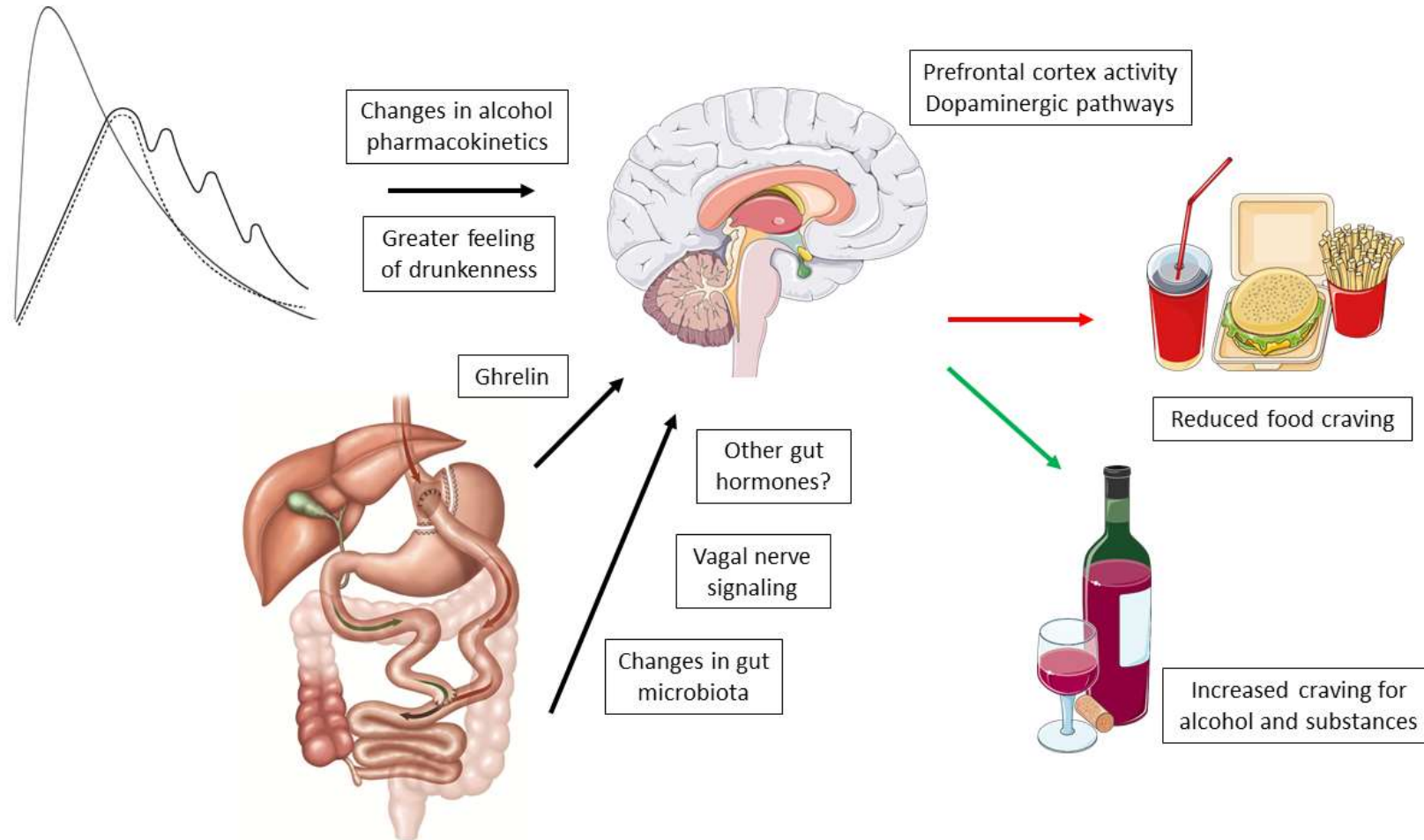


Lefere S et al. Hepatology 2017;66:289-291

Lefere S et al. Obes Surg 2020;4659-4669

Geerts A et al. Transplant Proc 2010;4395-4398

## Potential mechanisms involved in post-bariatric surgery AUD



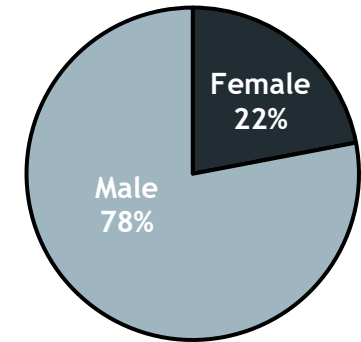
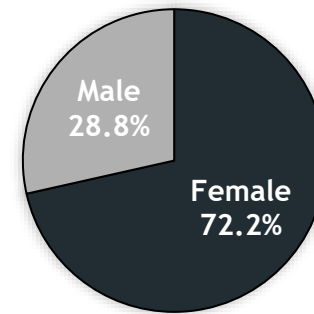
## Bariatric Surgery Patients Are at Risk for Alcoholic Liver Disease with Need for Liver Transplantation

Lefere S et al

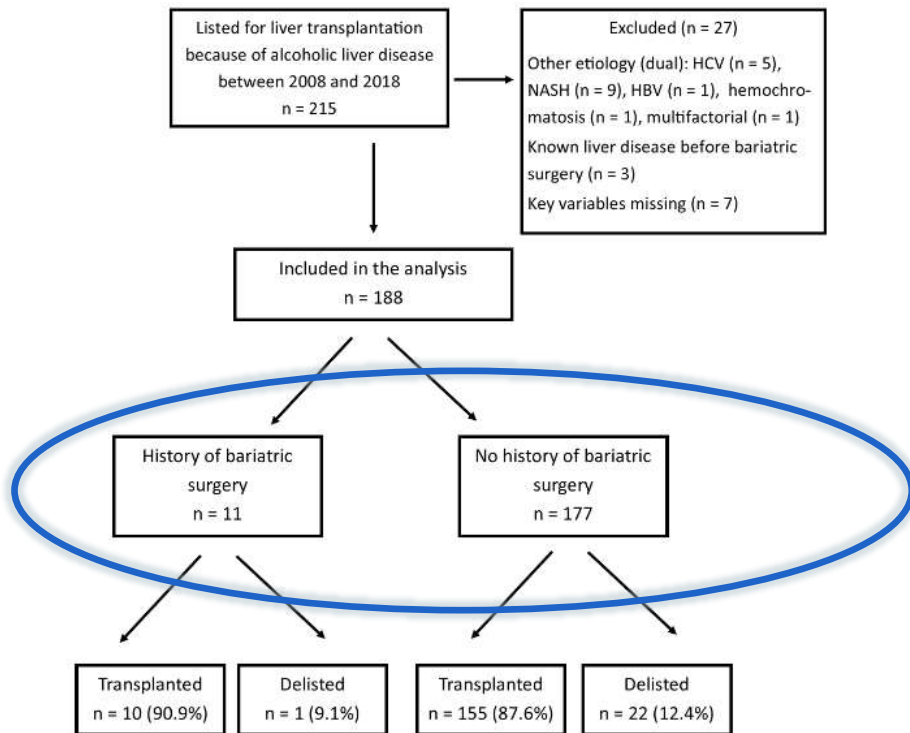
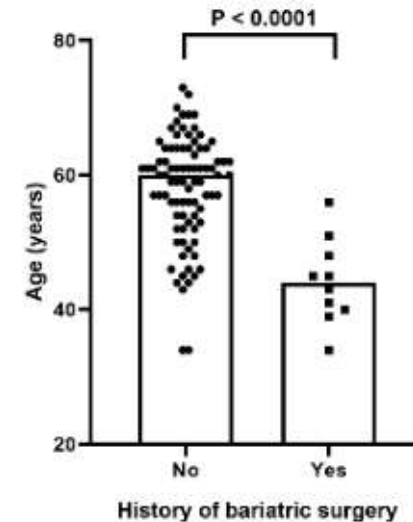
### GENDER

HISTORY OF BARIATRIC SURGERY

NO HISTORY OF BARIATRIC SURGERY



### AGE

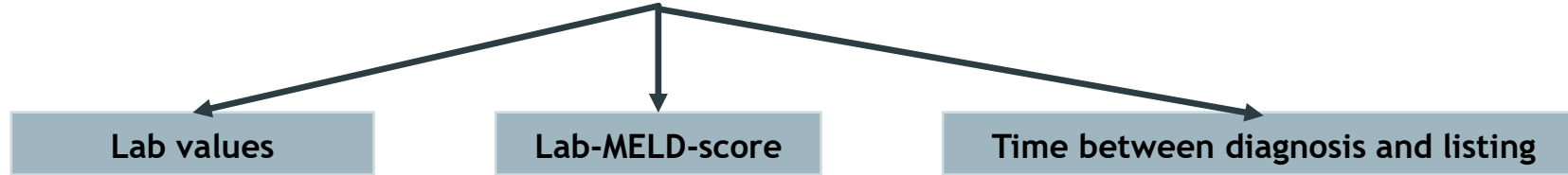




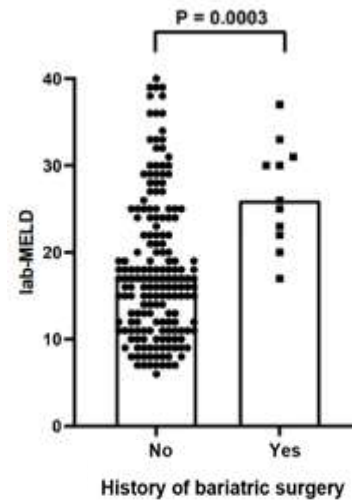
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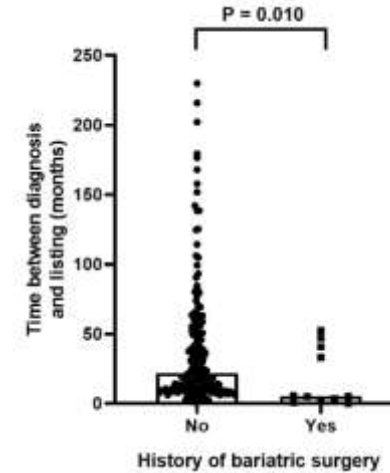
### SEVERITY OF LIVER DISEASE



	BS	No BS	
INR (0.9-1.1)	2,30	1,51	↑↑
Albumin (35-54 g/L)	28	33	↓↓
Total bilirubin (0.3-1.2 mg/dL)	4,90	2,48	↑↑



BS: 26  
No BS: 17



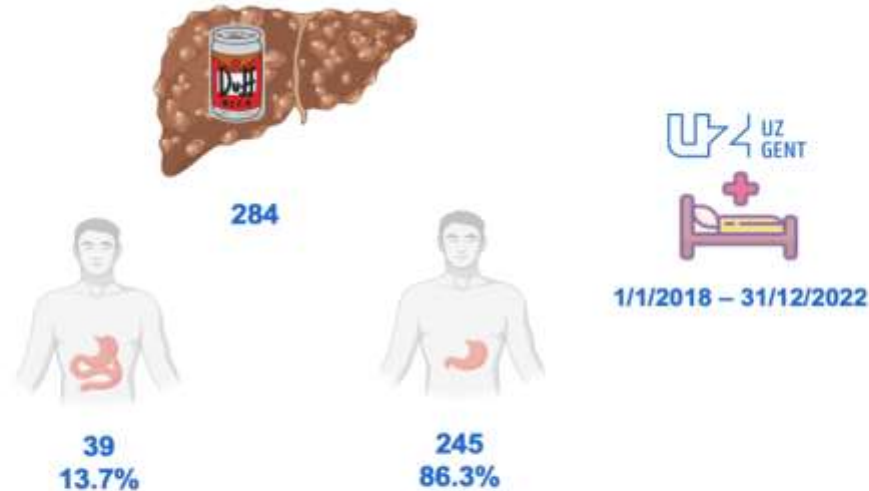
BS: 5 months  
No BS: 22 months

## Multicentric trial : Impact of prior bariatric surgery on the progression of alcoholic liver disease and need for liver transplantation (preliminary data, unpublished) (Lefere et al.)

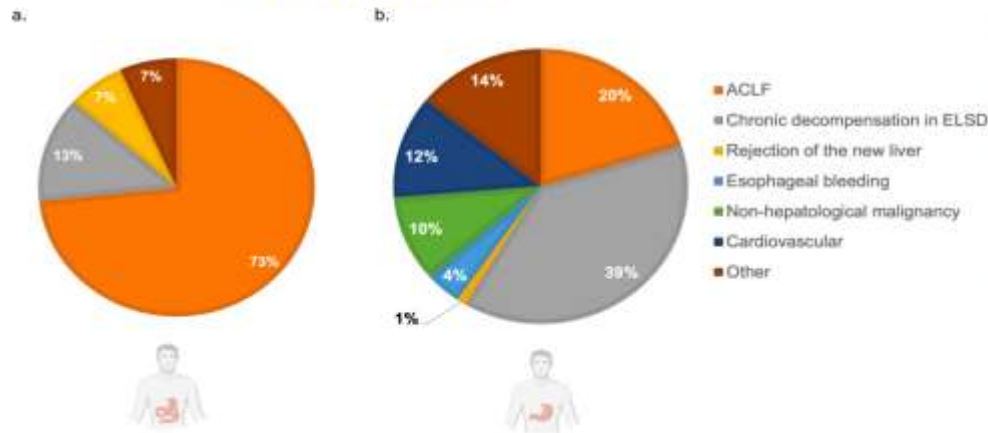
- ▶ Biological sex
  - BS group: 53.6% female
  - Non-BS: 18.0% female
  - P < 0.001**
- ▶ Age Median 56 vs. 62 years
  - P = 0.005**
- ▶ Time spent on the waiting list
  - Median 41 vs. 141 months
  - P < 0.001**
- ▶ Time between BS and diagnosis : median 80 months
- ▶ Complications (BS vs. Non-BS)
  - Ascites 92.9% vs. 64.3%, **P = 0.003**
  - HCC 10.7% vs. 51.0%, **P < 0.001**
  - Infections (> SBP) 42.9% vs. 19.2%, **P = 0.004**
- ▶ Complications after LTx (BS vs. Non-BS)
  - NS for Biliary complications, infections, re-Tx
  - Alcohol relapse 28.6% vs. 12.6%, **P = 0.021**

# Obesity surgery in MAFLD: call for a liver transplant?

Patients hospitalized with alcohol-related liver disease and prior bariatric surgery are more prone to develop acute-on-chronic liver failure (Onghena L et al. oral presentation IFSO )



## Cause of death



▶ Similar survival in younger BS population.

▶ Mortality in BS population was mainly due to **ACLF**.

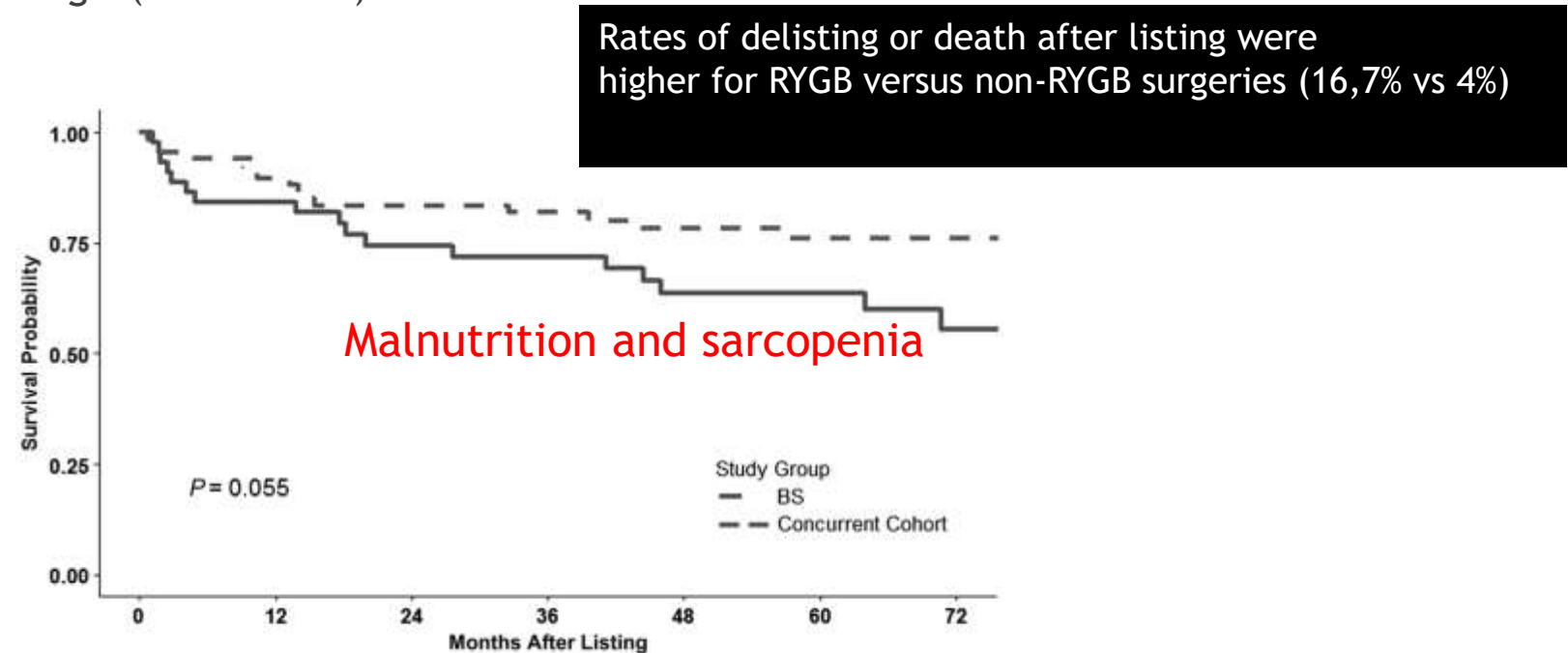
▶ Alcohol effects = **disproportionate**

- ▶ Lower amount
- ▶ Shorter 'abuse'

▶ Alcohol intake should **always** be questioned **pre-operative** and monitored **post-operatively** by surgeons and general doctors!

## Outcome of liverTx in patients with prior BS

- ▶ More LT candidates are presenting with prior bariatric surgery.
- ▶ Outcomes are probably comparable with other transplant recipients (Safwan et al, Iannelli et al, Serrano et al)
- ▶ Less survival during time of listing? (Idriss et al.)



## General conclusions

### ► Benefits of BS in MAFLD patient

- High rates of resolution of NASH and fibrosis
- Long-term beneficial effects on liver and other co-morbidities
- Excepted prevention of development of liver cirrhosis and HCC and decrease the need for liver Tx

### ► Pitfalls of BS in MAFLD patients:

- Severe **liver failure** especially with **severe malabsorptive procedures** occur, although rare, but might require LT.
- Importance of recognizing the onset of acute/subacute liver failure after BS to avoid liver transplantation by adequate nutritional support and BS reversal
- **Alcohol use after bariatric surgery** can lead to rapid development of liver failure with need of transplant
- Type of surgery is one of the criteria that should be considered in balancing the risks and benefits of BS



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