



# Comparison of the metabolic effects of Transit Bipartition (TB) and Single anastomosis duodeno-ileal bypass (SADI-S) in a minipig model

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# Introduction

## ➤ Bariatric-metabolic surgery

- 4 recommended procedures in France



- **Side-effects** (nutritional deficiencies ...)

➔ 12,2% revision surgery after sleeve gastrectomy<sup>1</sup>

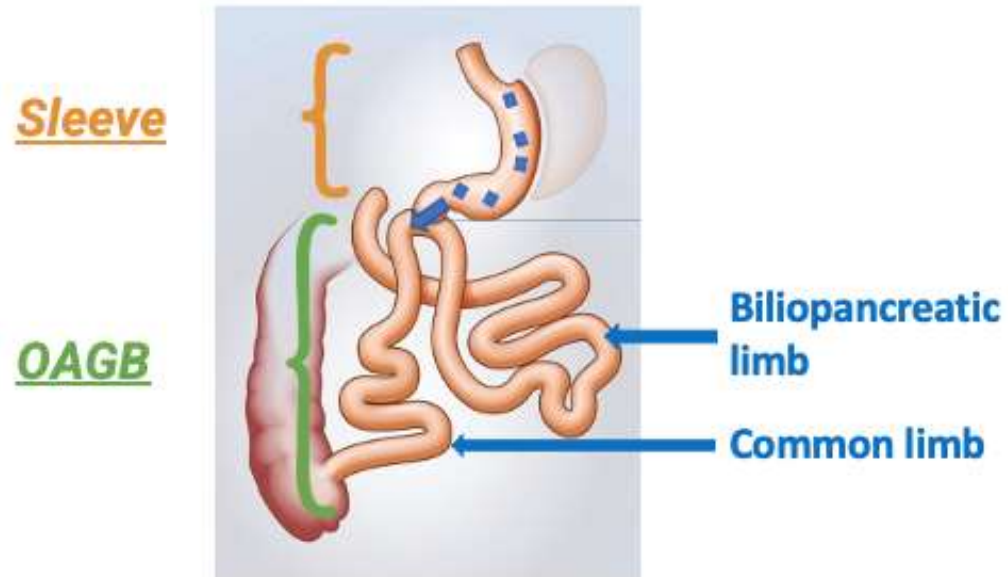
<sup>(1)</sup>Lazzati A and al, Revision surgery after sleeve gastrectomy: a nationwide study with 10 years of follow-up. Surgery for Obesity and Related Diseases. oct 2020.



# Introduction

- Single anastomosis duodeno-ileal bypass (SADI-S)

**Single Anastomosis Duodeno-Ileal Bypass with Sleeve gastrectomy (SADI-S)**



- **Clinical results** (safety, weight loss, T2D remission)<sup>(1)</sup>

<sup>(1)</sup>Sánchez-Pernaute A, Rubio Miguel Ángel, Cabrerizo L, et al.. Single-anastomosis duodenoileal bypass with sleeve gastrectomy (SADI-S) for obese diabetic patients. *Surg Obes Relat Dis* 2015;11:1092–8.

# Introduction



## ➤ Sleeve Gastrectomy with Transit Bipartition (BPT)

- **Clinical results** (safety, weight loss, T2D remission, malabsorption)<sup>(1)</sup>

<sup>(1)</sup>Santoro S. et al. Sleeve Gastrectomy With Transit Bipartition: A Potent Intervention for Metabolic Syndrome and Obesity. *Annals of Surgery*. juill 2012;256(1):104-10.



# Research question

**What are the effects on glucose metabolism induced by TB and SADI-S compared with the effect of SG alone?**



# Materials and Methods

# Study protocol



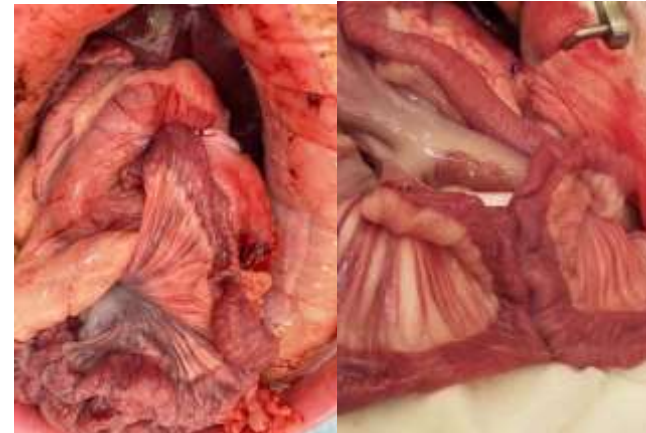
- Healthy, non-obese, non-diabetic adult female  
Gottingen minipigs

SHAM

SLEEVE  
GASTRECTOMY  
(SG)

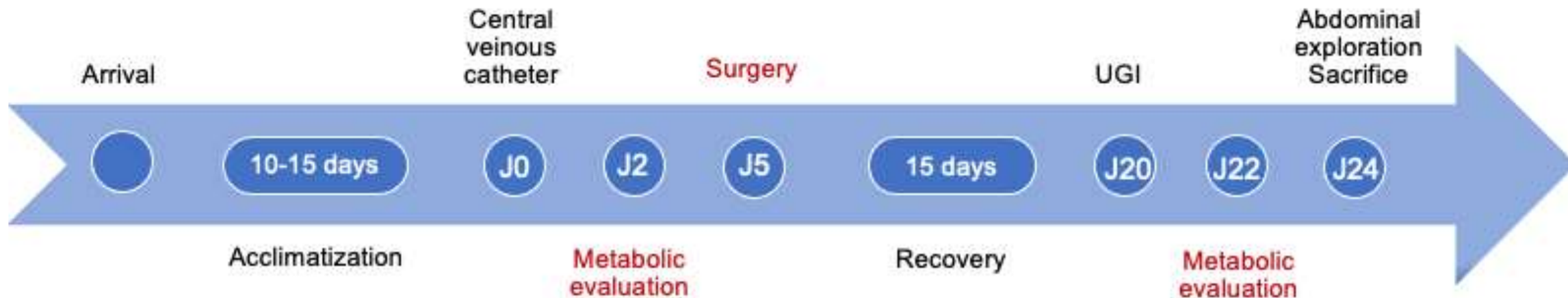
SLEEVE  
GASTRECTOMY  
WITH TRANSIT  
BIPARTITION  
(TB)

SINGLE  
ANASTOMOSIS  
DUODENO-ILEAL  
BYPASS  
(SADI-S)



# Study protocol

- Clinical evaluation
  - Food intakes, weight
- Metabolic evaluation
  - Mixed-meal test
  - Blood glucose, total GLP-1, insulin, D-xylose







# Results



# Follow-up

- After surgery
  - **No premature death**
  - **One complication:** gastro-ileal anastomosis stenosis in the TB group (**excluded**)

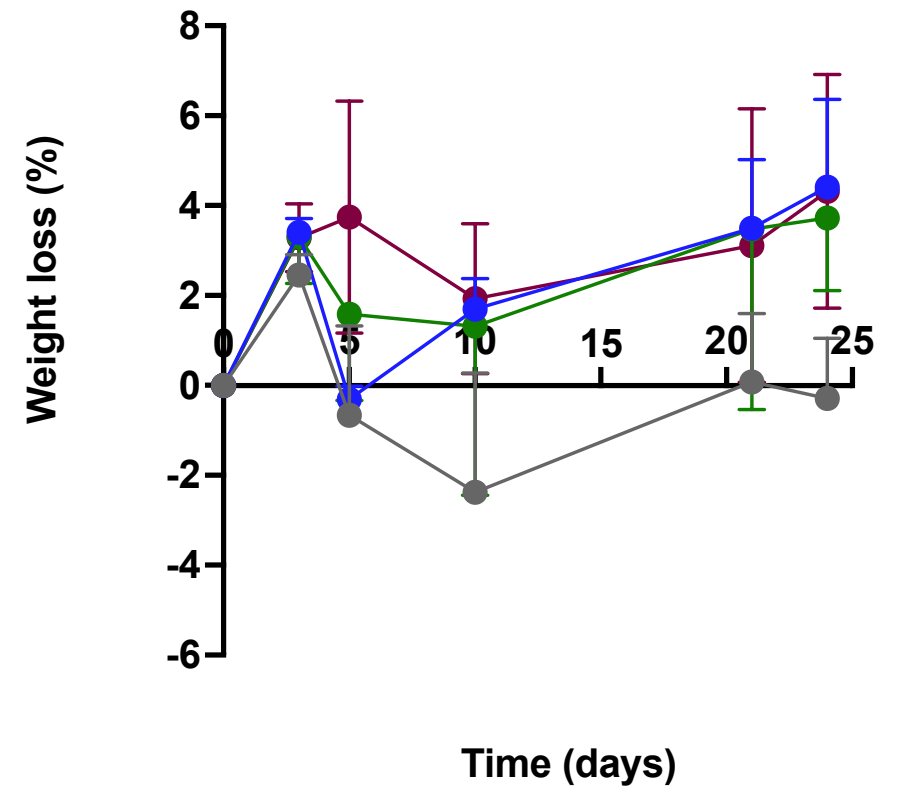
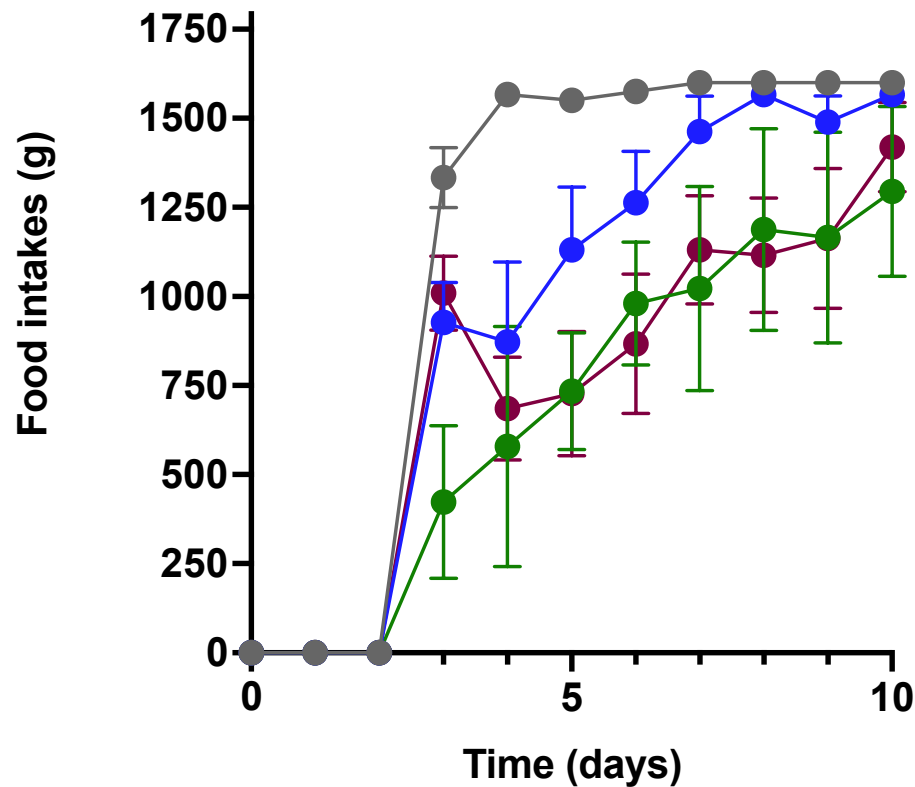


# Food intakes and weight

- Food intakes ( $p=0,049$ )
- Weight loss ( $p<0,001$ )

## ➤ After Surgery

- Sham  
n=6
- Sleeve  
n=6
- Bipartition  
n=5
- SADI-S  
n=6

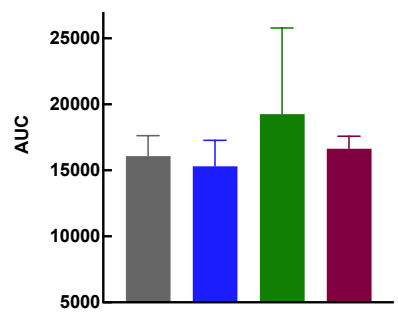
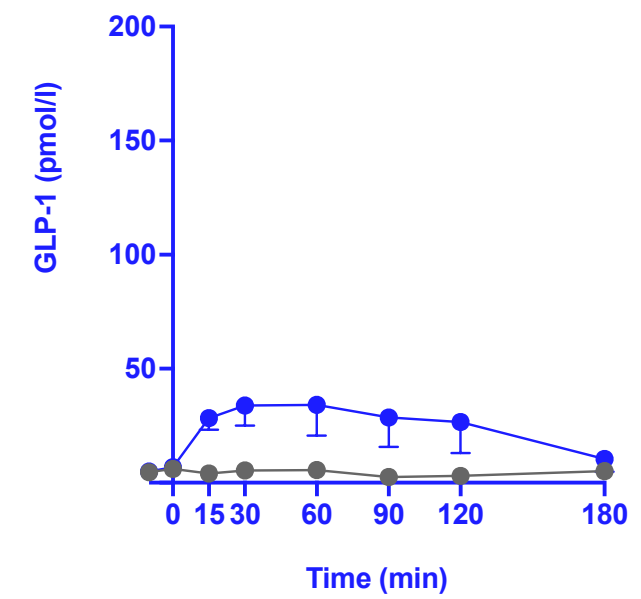
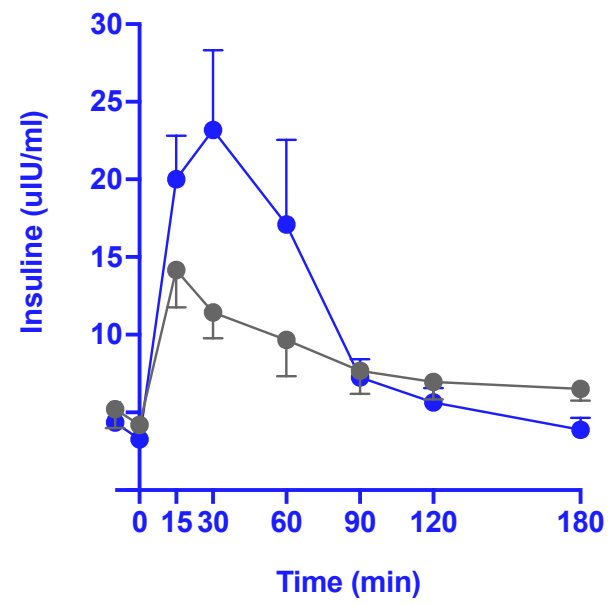
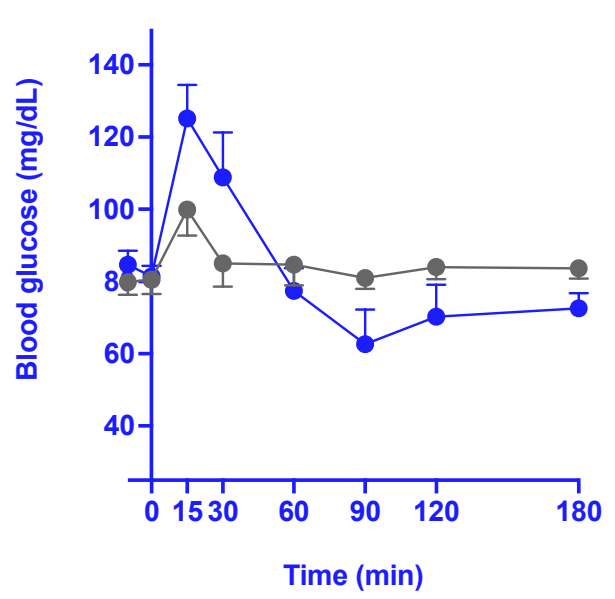




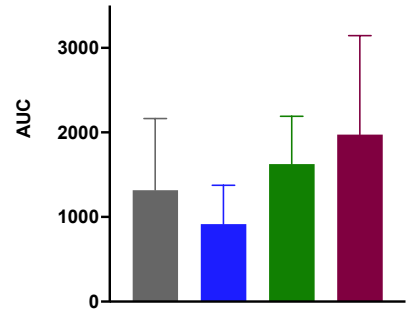
# Post prandial glucose metabolism

➤ After Surgery

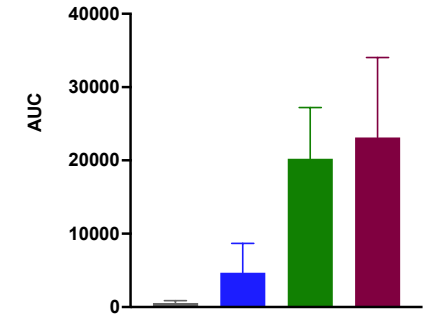
- Sham n=6
- Sleeve n=6



Blood glucose (p=0,3)



Insuline (p=0,1)



GLP-1 (p=0,7)

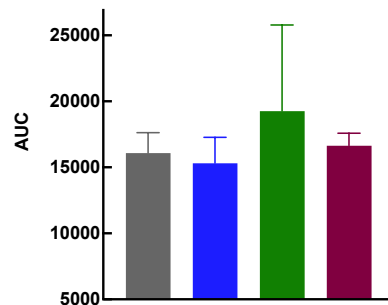
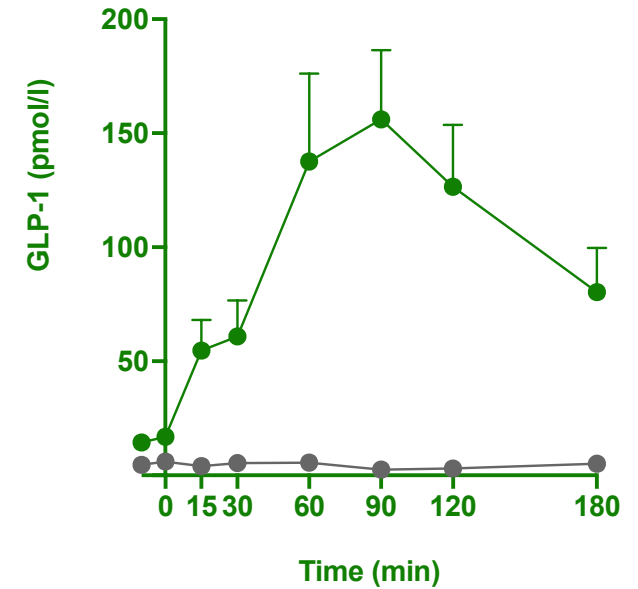
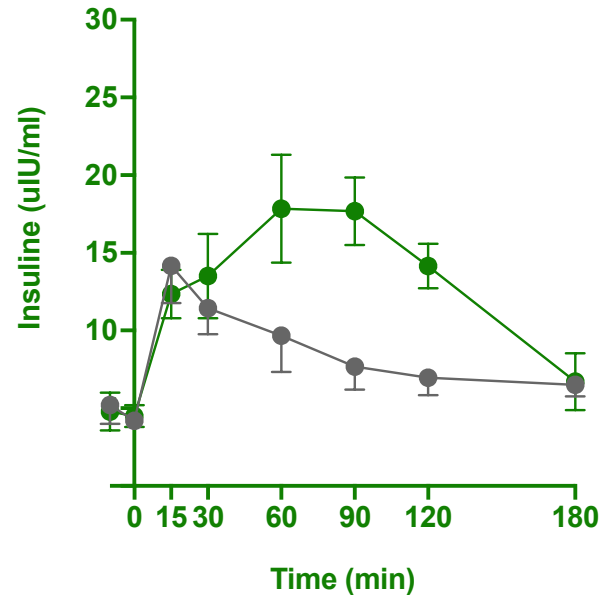
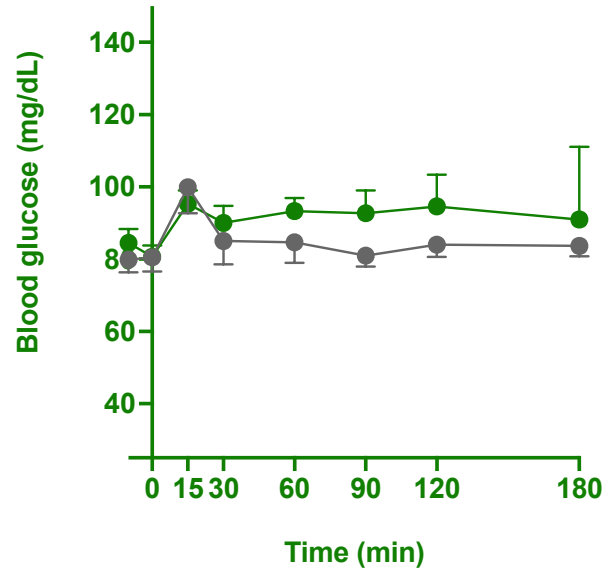


# Post prandial glucose metabolism

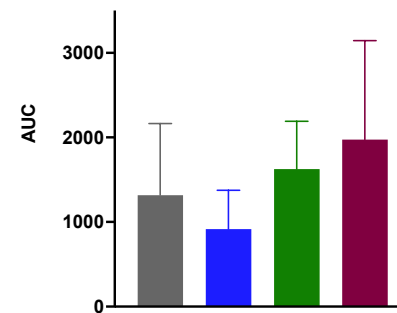
➤ After Surgery

● Sham  
n=6

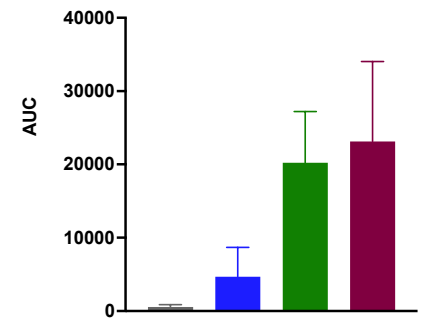
● Bipartition  
n=5



Blood glucose (p=0,3)



Insuline (p=0,1)



GLP-1 (p=0,004)

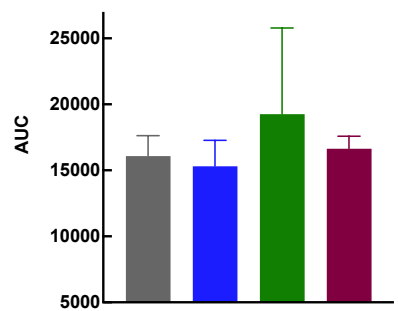
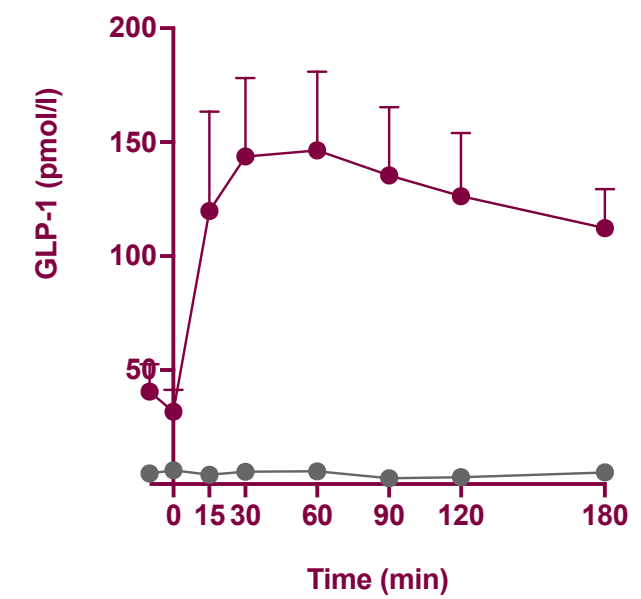
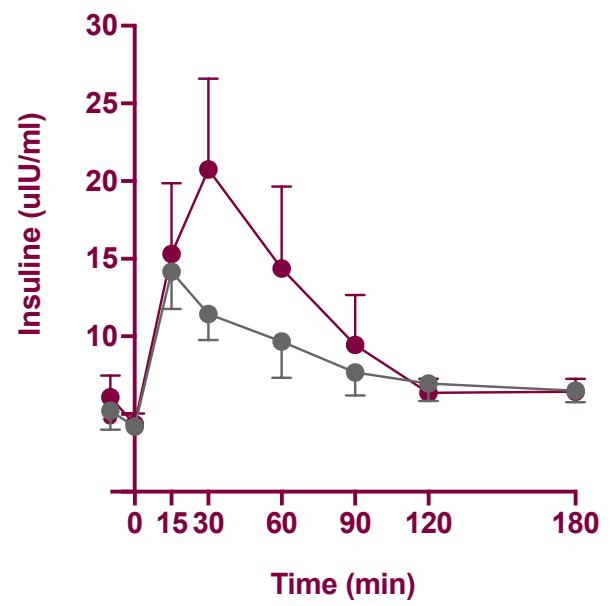
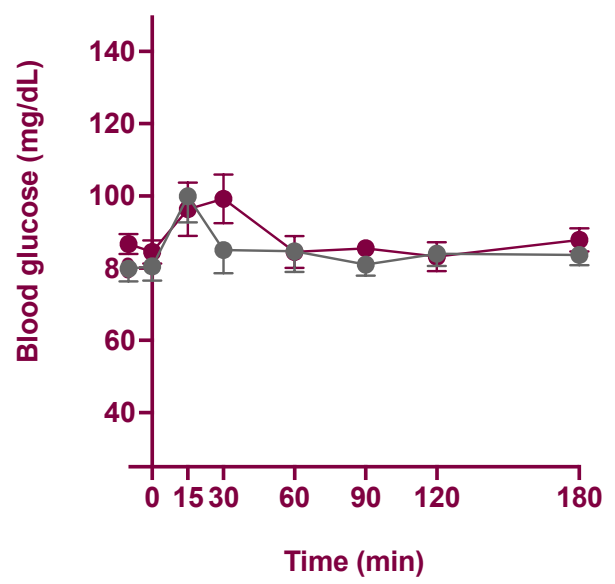


# Post prandial glucose metabolism

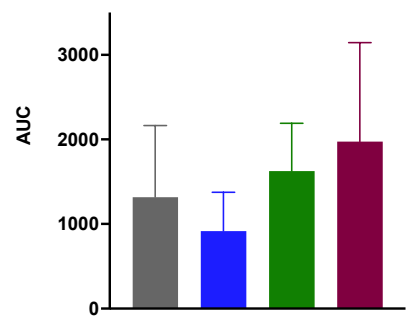
➤ After Surgery

● Sham  
n=6

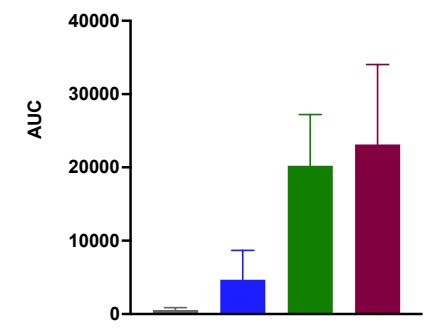
● SADI-S  
n=6



Blood glucose (p=0,3)



Insuline (p=0,1)



GLP-1 (p=0,001)

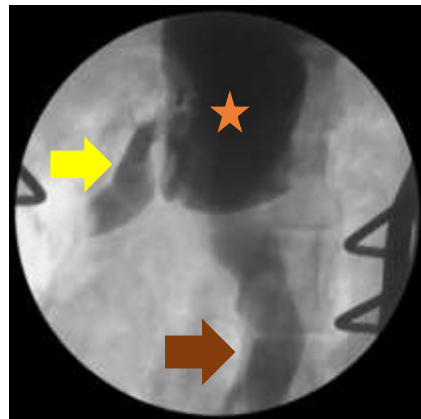
# Intestinal glucose absorption

- **D-xylose absorption (p=0,03)**

## ➤ After Surgery

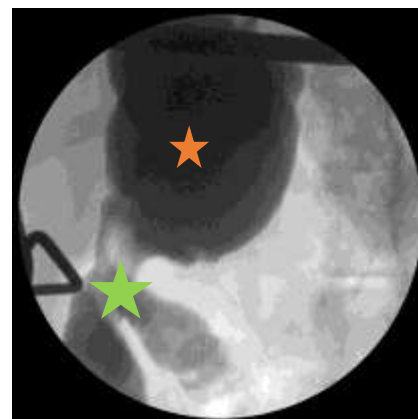
- Sham  
n=6
- Sleeve  
n=6
- Bipartition  
n=5
- SADI-S  
n=6

Transit Bipartition

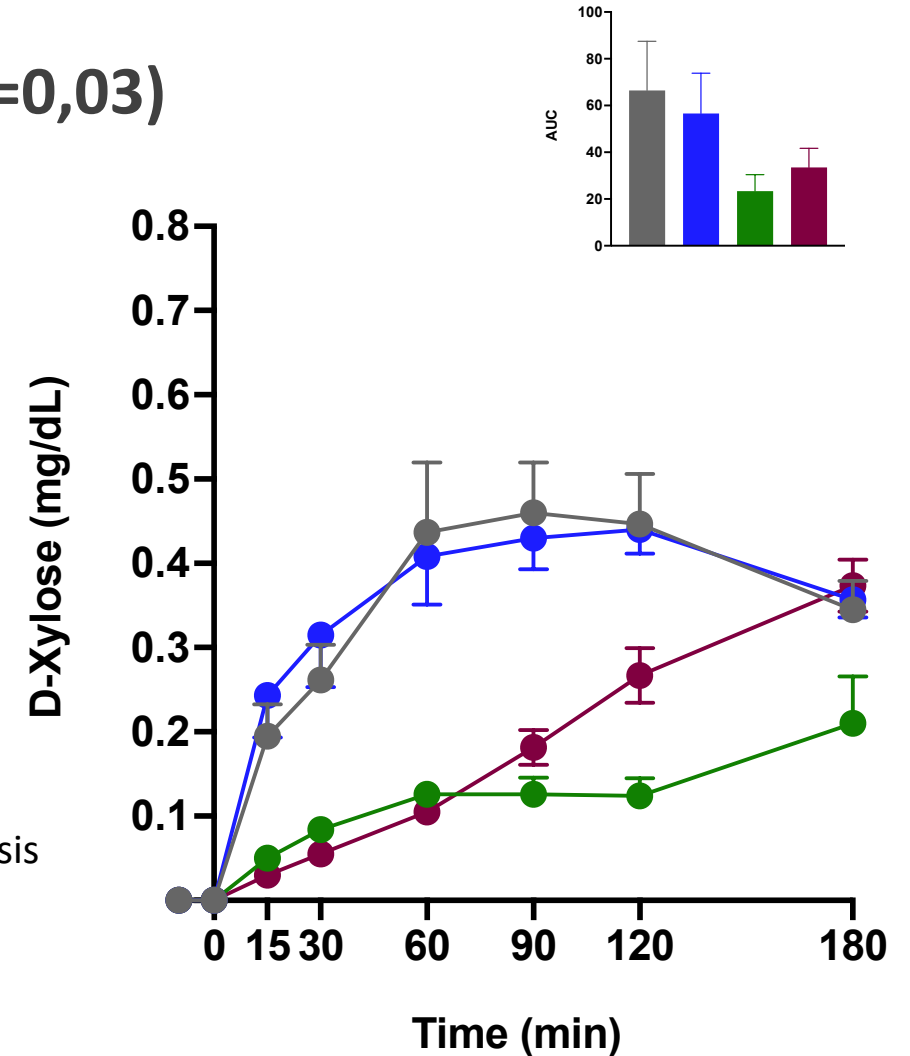


- ★ Sleeve gastrectomy
- ➔ Alimentary limb
- ➔ Duodenum

SADI-S



- ★ Sleeve gastrectomy
- ★ Duodeno-ileal anastomosis





# Conclusion

- TB et SADI-S in the minipig model
  - **Less** post prandial hyper/hypo **glycemia variation**
  - **More GLP-1** and **early satiety**
  - **Reduction of intestinal glucose absorption** (xylose)
  - **Perspectives** : clinical studies





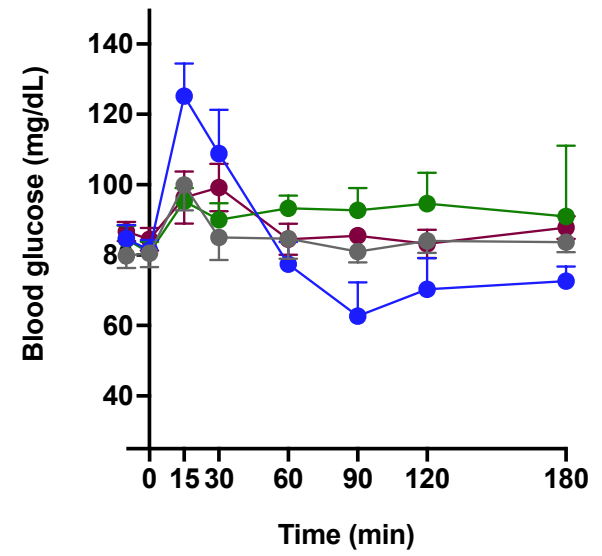
THANK YOU FOR THE ATTENTION

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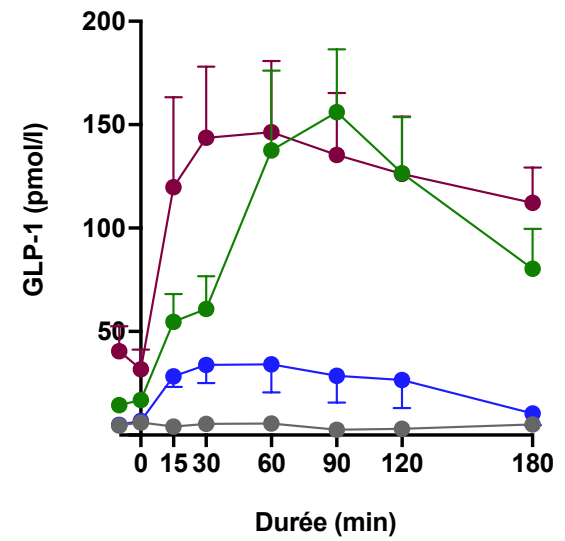




Postprandial blood glucose level after surgery

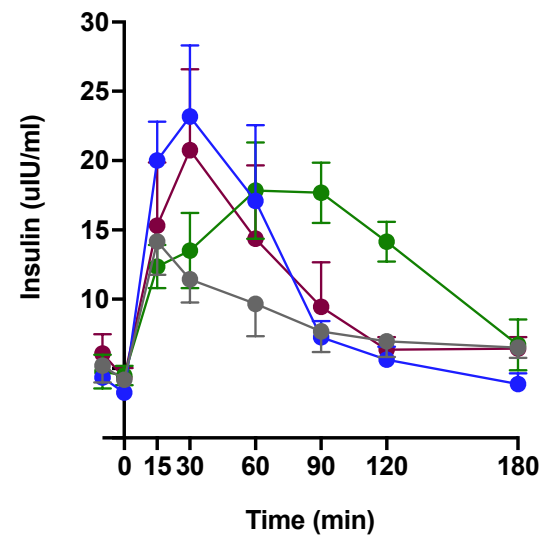


Post prandial GLP-1 secretion after surgery

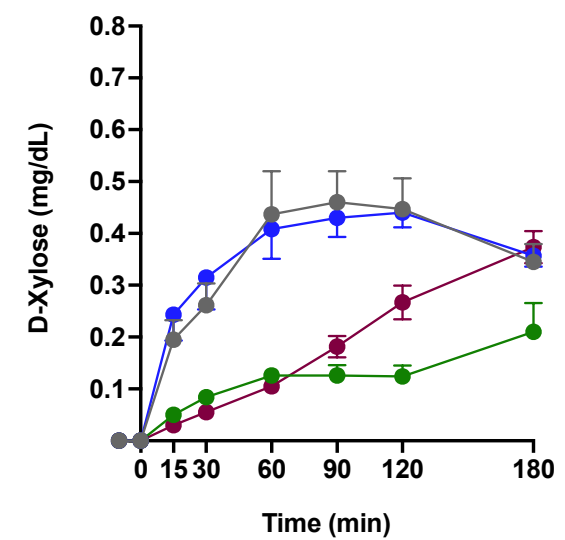


- Sham n=6
- Sleeve n=6
- Bipartition n=5
- Sadi-S n=6

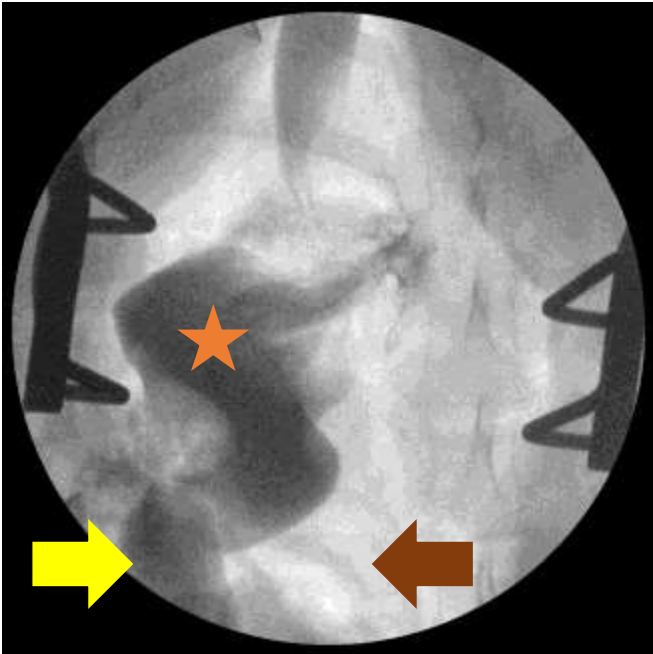
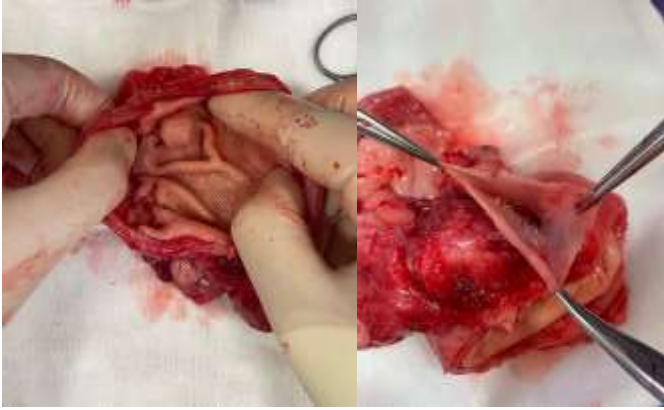
Post prandial insulin secretion after surgery



D-Xylose absorption after surgery

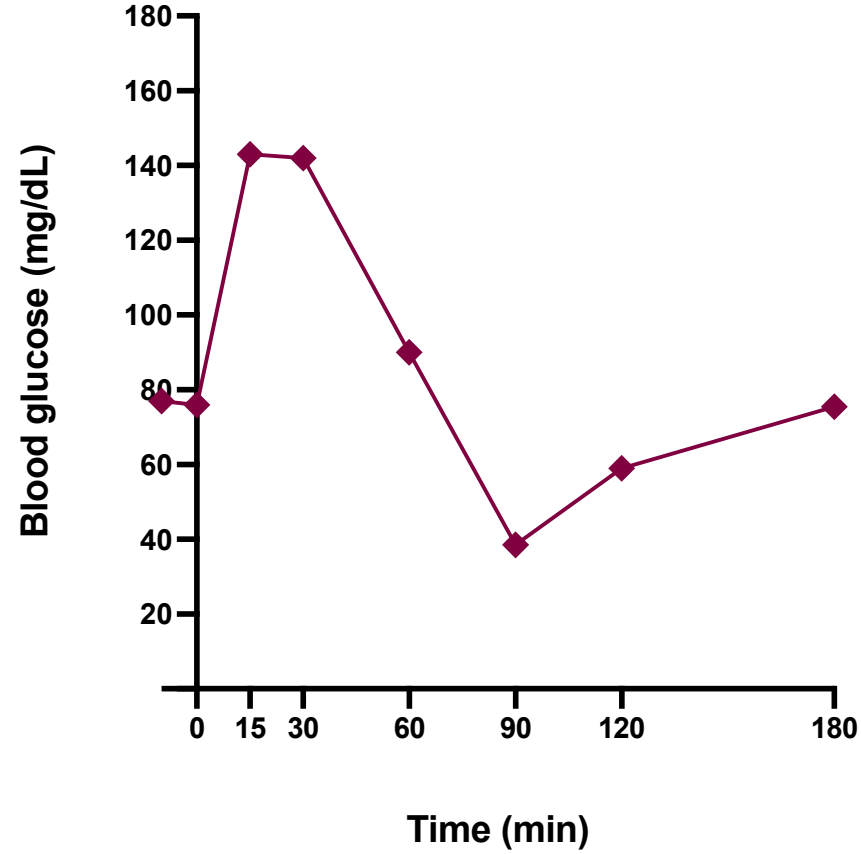


- Sham n=6
- Sleeve n=6
- Bipartition n=5
- Sadi-S n=6

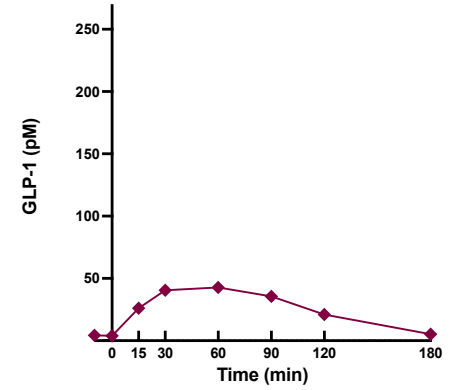


- ★ Sleeve gastrectomy
- ➔ Duodenum
- ➔ Alimentary limb

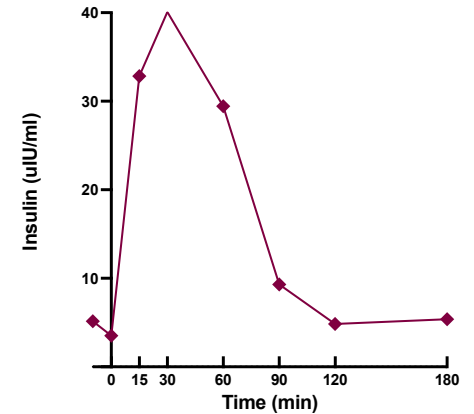
### Blood glucose concentration



### GLP-1



### Insulin



### D-Xylose

