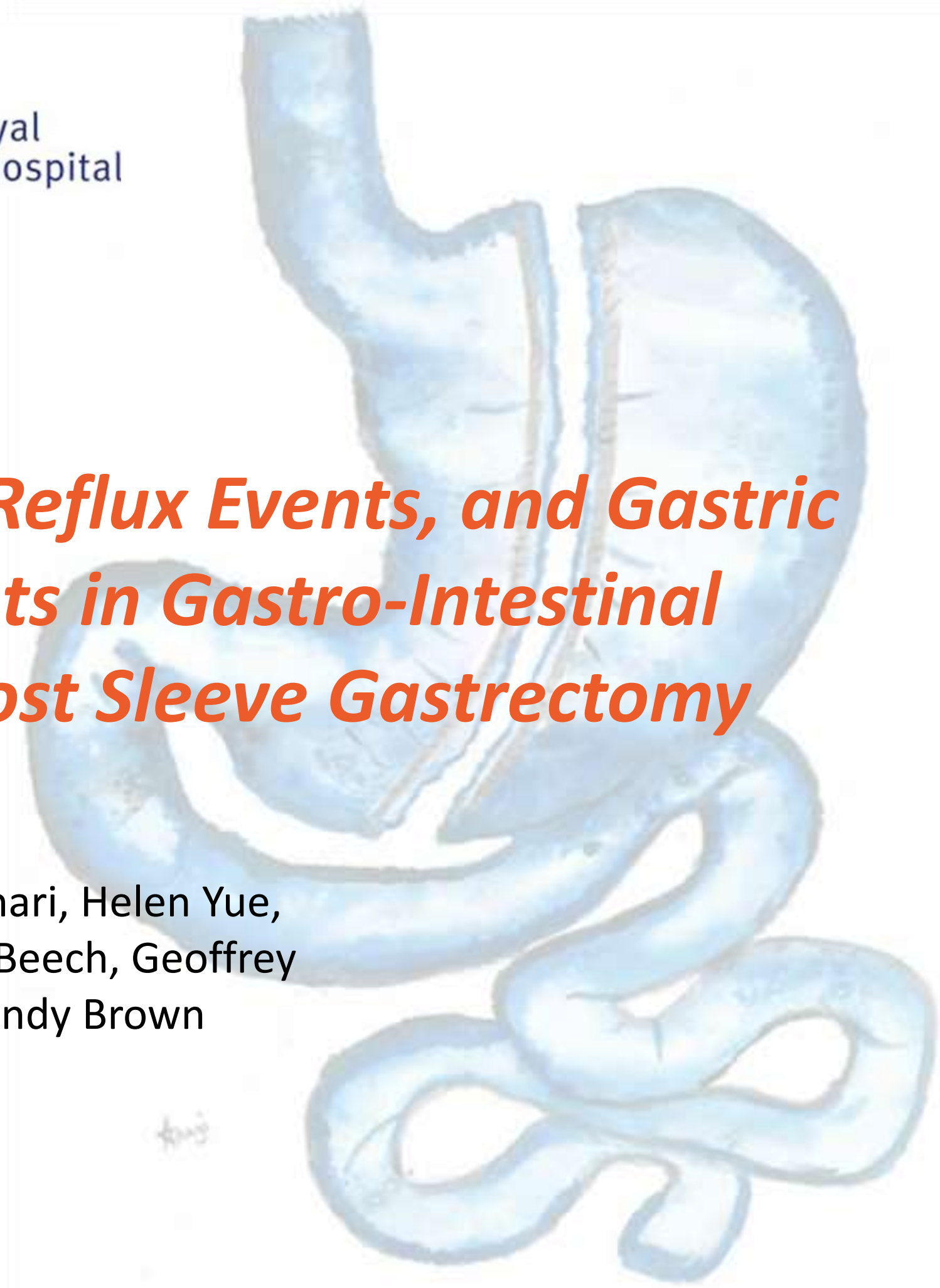
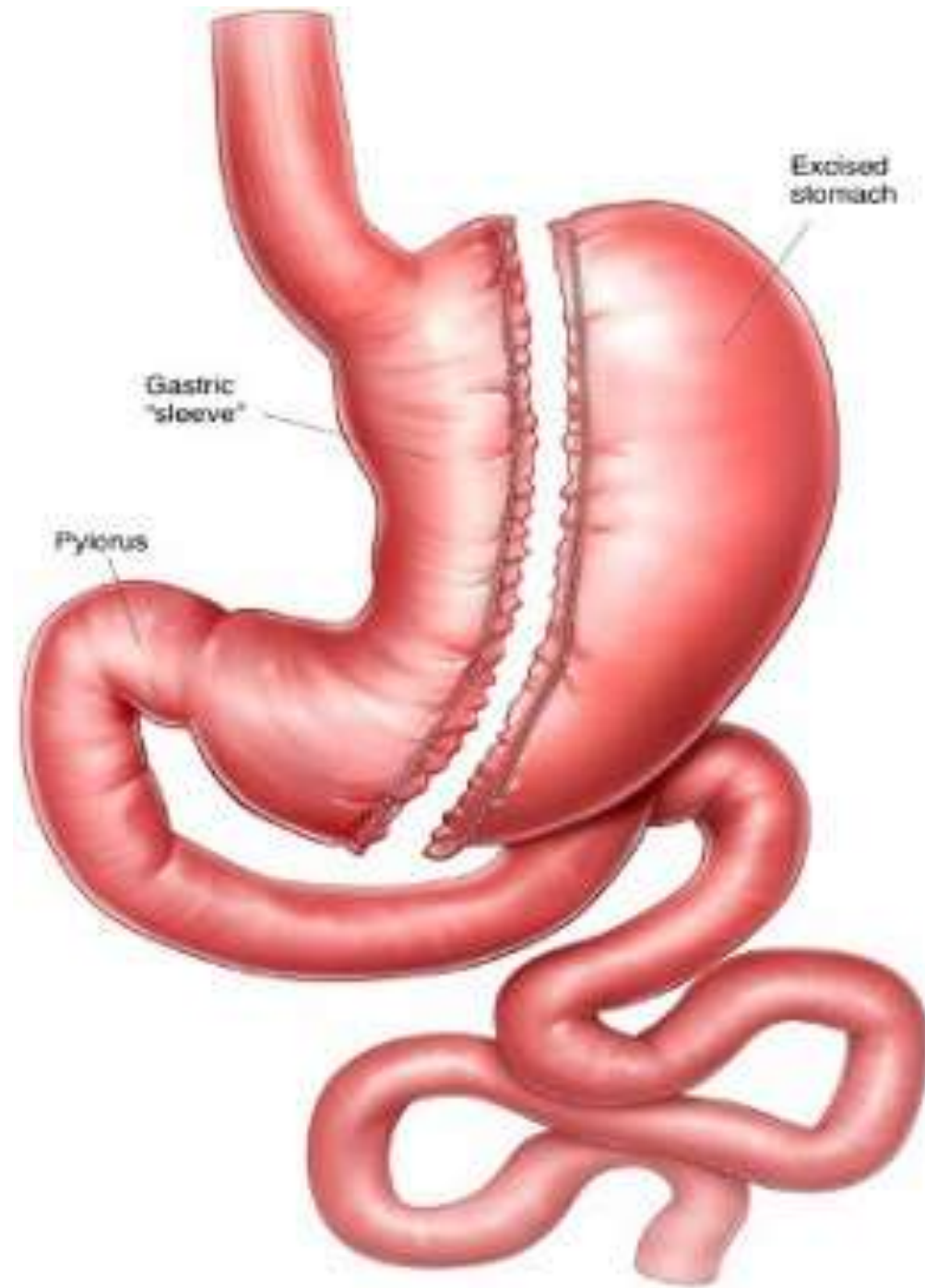


Changes in Oesophageal Transit, Macro-Reflux Events, and Gastric Emptying Correlate with Improvements in Gastro-Intestinal Symptoms and Food Tolerance Early Post Sleeve Gastrectomy

Authors: Anagi Wickremasinghe, Yazmin Johari, Helen Yue, Cheryl Laurie, Kalai Shaw, Julie Playfair, Paul Beech, Geoffrey Hebbard, Kenneth Yap, Paul Burton, Wendy Brown



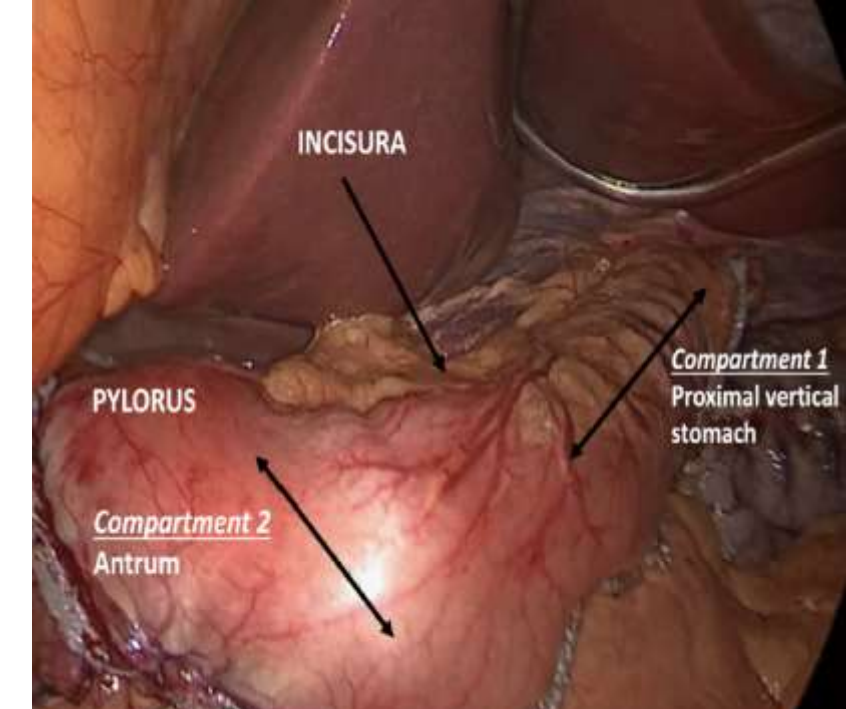
SLEEVE GASTRECTOMY (SG)



- Early in the post-operative period there are significant alterations to gastrointestinal symptoms, sensations and food intake.
- These appear to improve over time to the 12 month mark with increasing food tolerance.
- It is unclear which physiological mechanisms mediate these and how they change over time. Understanding the basis of evolution in sensations would be of significant advantage to clinicians following-up and counselling patients.

SLEEVE GASTRECTOMY PHYSIOLOGY

- Substantial physiological changes have been observed following SG.
- Weight loss mechanisms are multifactorial and incompletely defined but appear to be associated with both hormonal alterations and changes in gastric emptying.
- Accelerated gastric emptying has been widely reported.

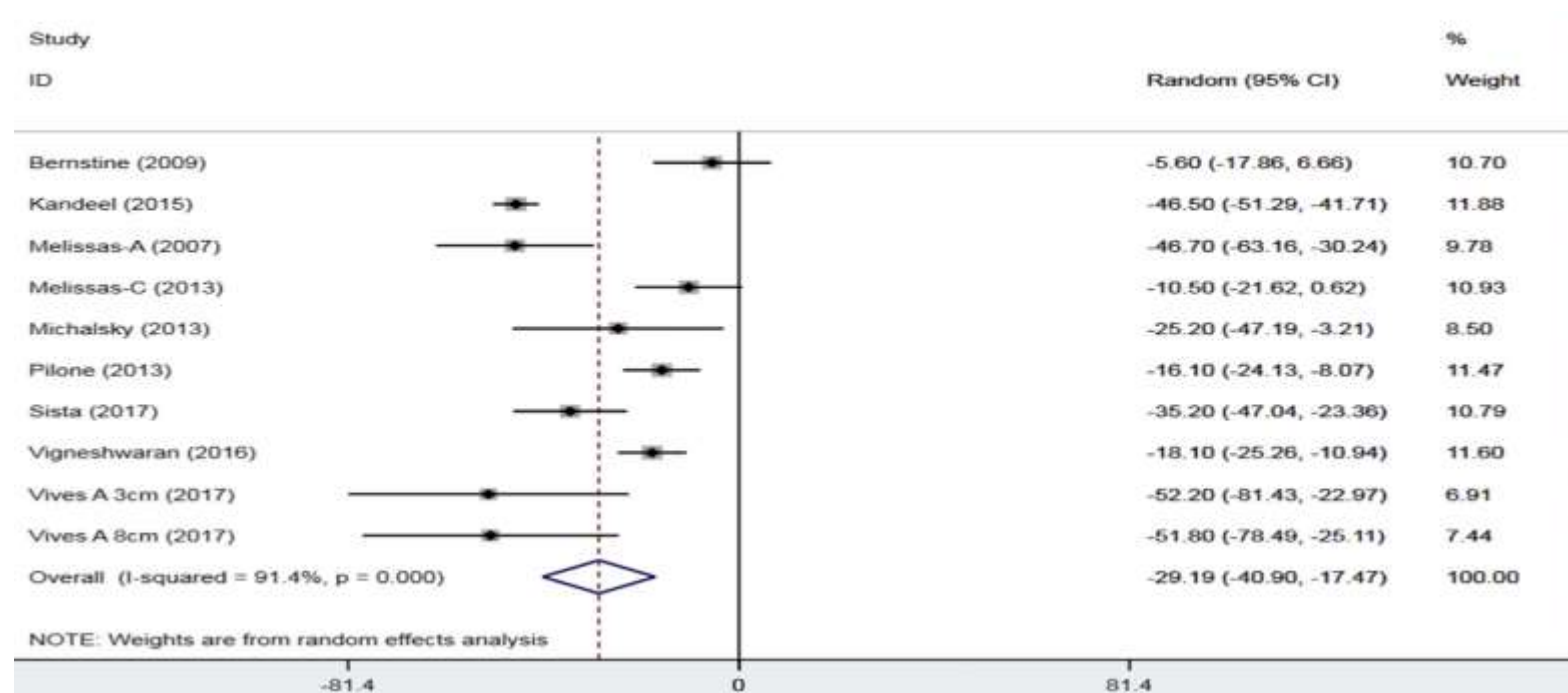


SYSTEMATIC REVIEWS AND META-ANALYSES

Changes in Time of Gastric Emptying After Surgical and Endoscopic Bariatrics and Weight Loss: A Systematic Review and Meta-Analysis

Siddharth Singh, Section Editor

Eric J. Vargas,* Fateh Bazerbachi,* Gerardo Calderon,* Larry J. Prokop,† Victoria Gomez,§ M. Hassan Murad,|| Andres Acosta,* Michael Camilleri,|| and Barham K. Abu Dayyeh*



Obesity Surgery (2022) 32:3922–3931
<https://doi.org/10.1007/s11695-022-06323-2>

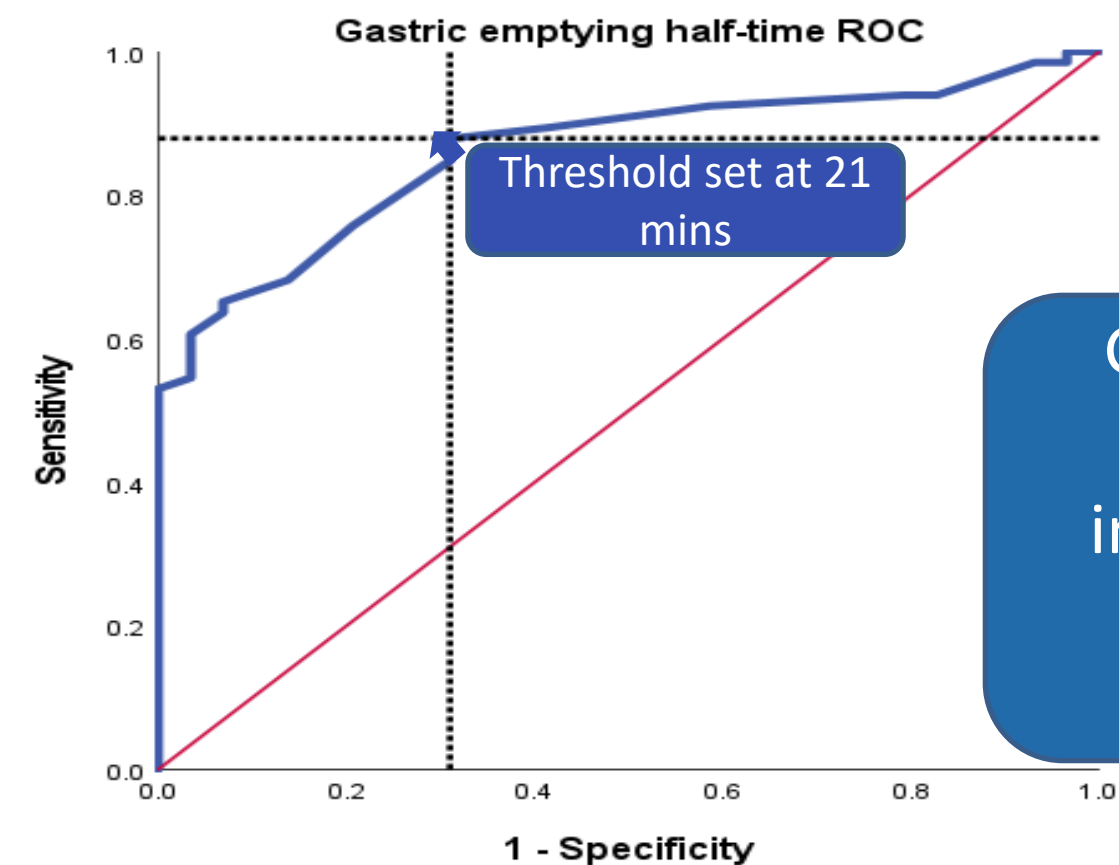


ORIGINAL CONTRIBUTIONS

Delayed Gastric Emptying After Sleeve Gastrectomy Is Associated with Poor Weight Loss

Anagi Chethana Wickremasinghe¹ · Yazmin Johari^{1,2} · Cheryl Laurie¹ · Kalai Shaw^{1,2} · Julie Playfair¹ · Paul Beech³ · Helen Yue³ · Louise Becroft^{1,2} · Geoffrey Hebbard⁴ · Kenneth S. Yap^{3,5} · Wendy Brown^{1,2} · Paul Burton^{1,2}

Received: 27 July 2022 / Revised: 8 October 2022 / Accepted: 11 October 2022 / Published online: 27 October 2022



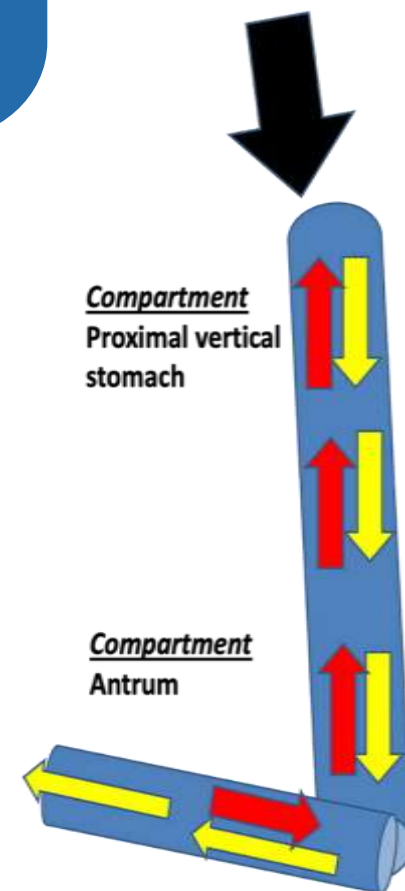
Gastric emptying rate
 For every 1 minute
 increase = 16% odds of
 poor weight loss

KEY PHYSIOLOGICAL CONCEPTS



Rapid duodenal delivery
force transmission via a non-compliant
tube and reflex antral contraction
leading to trans-pyloric flow and reflux
events

- Prior literature has evaluated gastric emptying changes before and after SG surgery and have not focussed on changes in gastric emptying in the first year after surgery



Obesity Surgery (2021) 31:725–737
<https://doi.org/10.1007/s11695-020-04988-1>

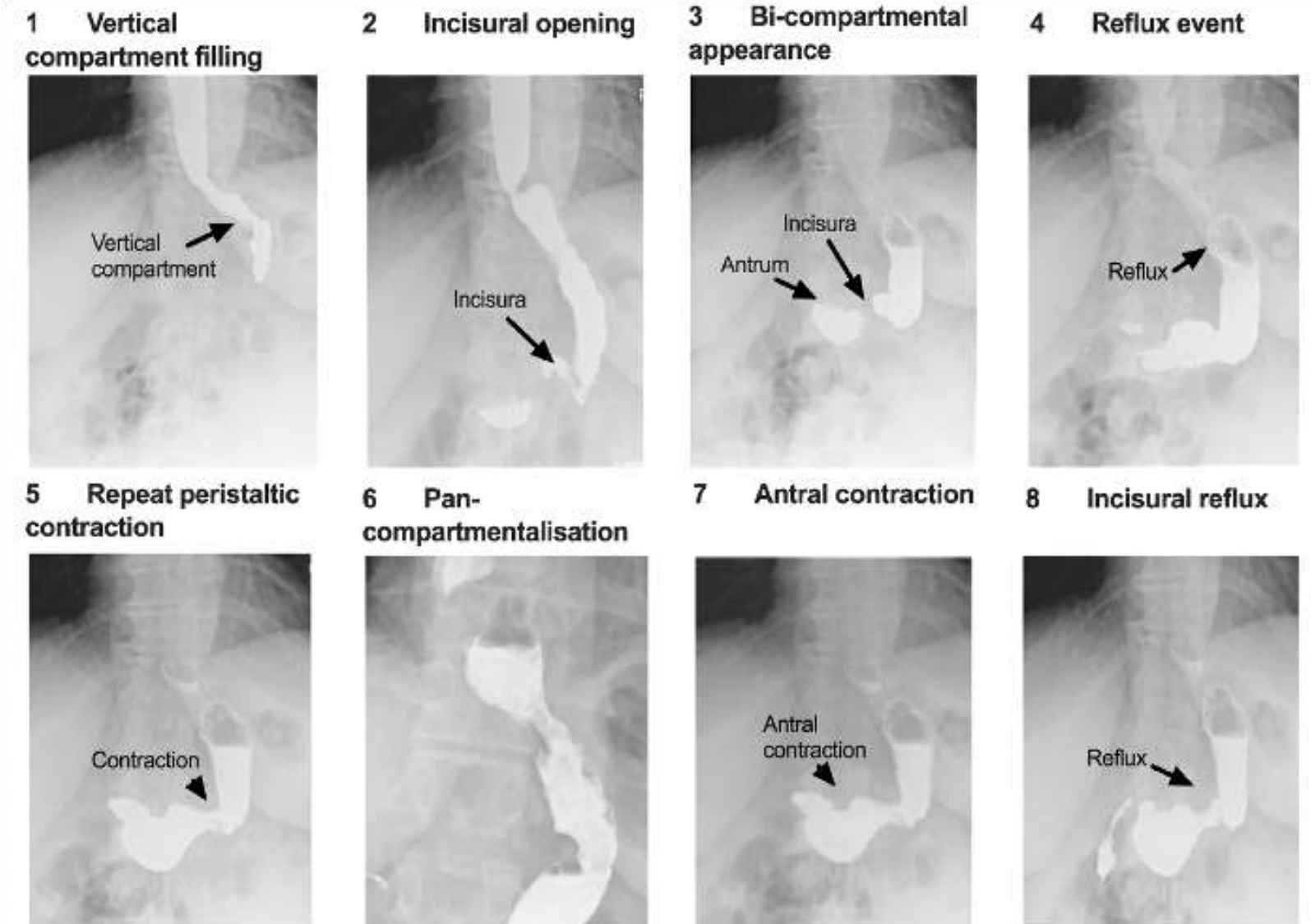


ORIGINAL CONTRIBUTIONS



Mechanisms of Esophageal and Gastric Transit Following Sleeve Gastrectomy

Yazmin Johari^{1,2} • Anagi Wickremasinghe¹ • Pradipta Kiswandono¹ • Helen Yue³ • Geraldine Ooi^{1,2} • Cheryl Laurie¹ • Geoffrey Hebbard⁴ • Paul Beech³ • Kenneth Yap³ • Wendy Brown^{1,2} • Paul Burton^{1,2}





HYPOTHESIS

Alterations and increases in reflux symptoms would be noted early in the post-operative period at around 6 weeks, and these would have improved by 6 and 12 months with gastric emptying remaining static.



AIMS

- To determine whether from 6 weeks to one year there were alterations in oesophageal transit, gastro-oesophageal reflux, and gastric emptying.
- To determine whether alteration in symptoms correlated with changes in physiology.

TRIAL DESIGN



Participants
Post sleeve gastrectomy
(n=13)



6 weeks



Nuclear
medicine
scintigraphy



Clinical
questionnaire



6 months



Nuclear
medicine
scintigraphy



Clinical
questionnaire



12 months



Nuclear
medicine
scintigraphy



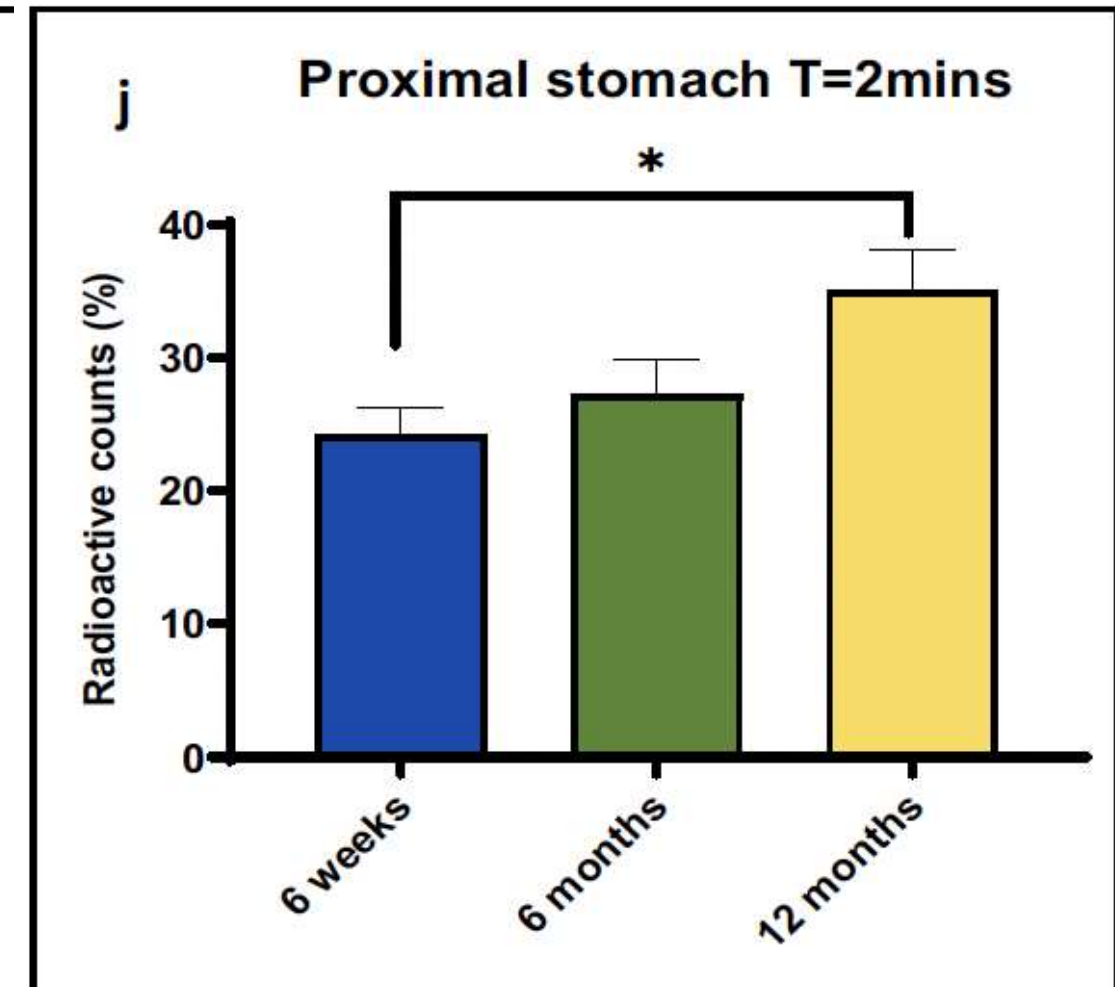
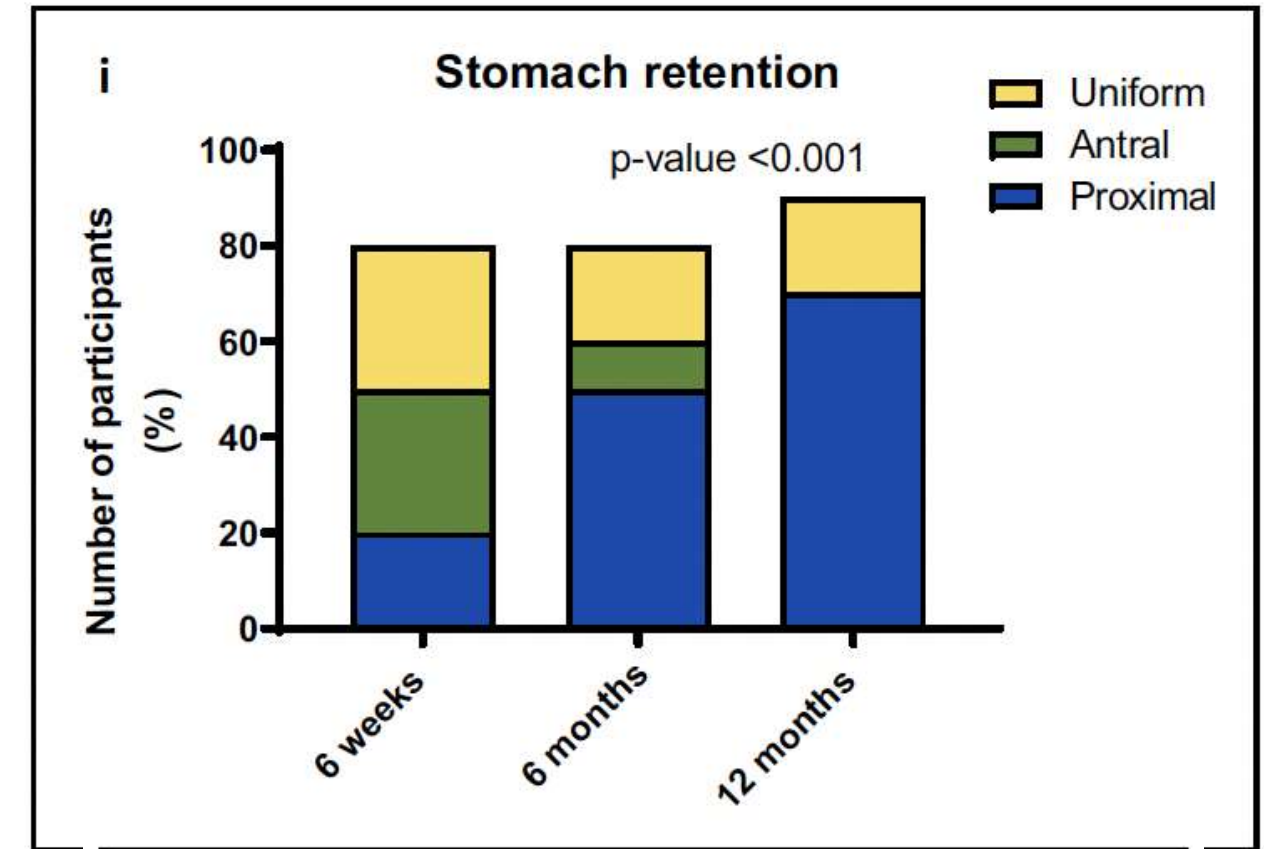
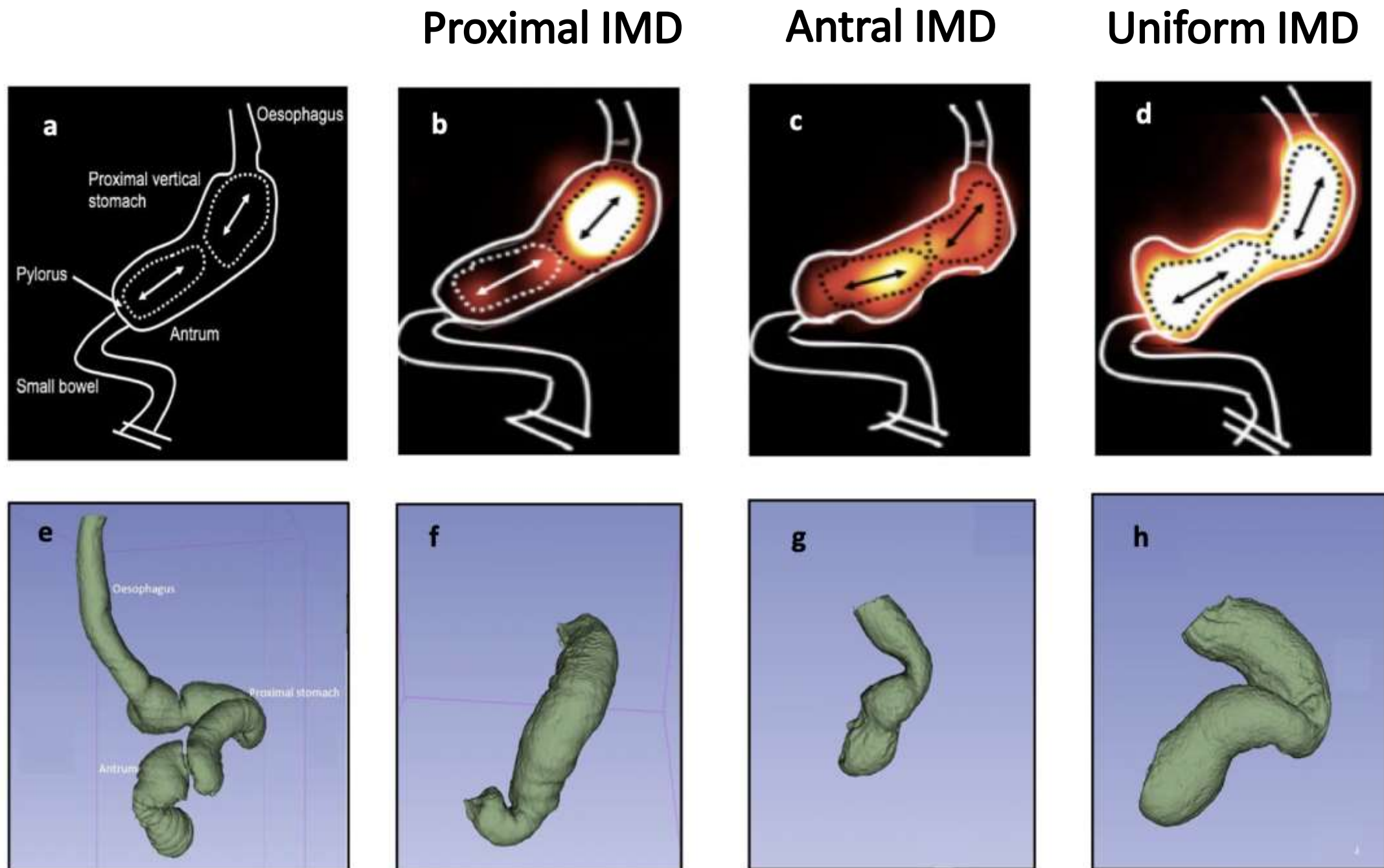
Clinical
questionnaire

PATIENT BASELINE DEMOGRAPHICS

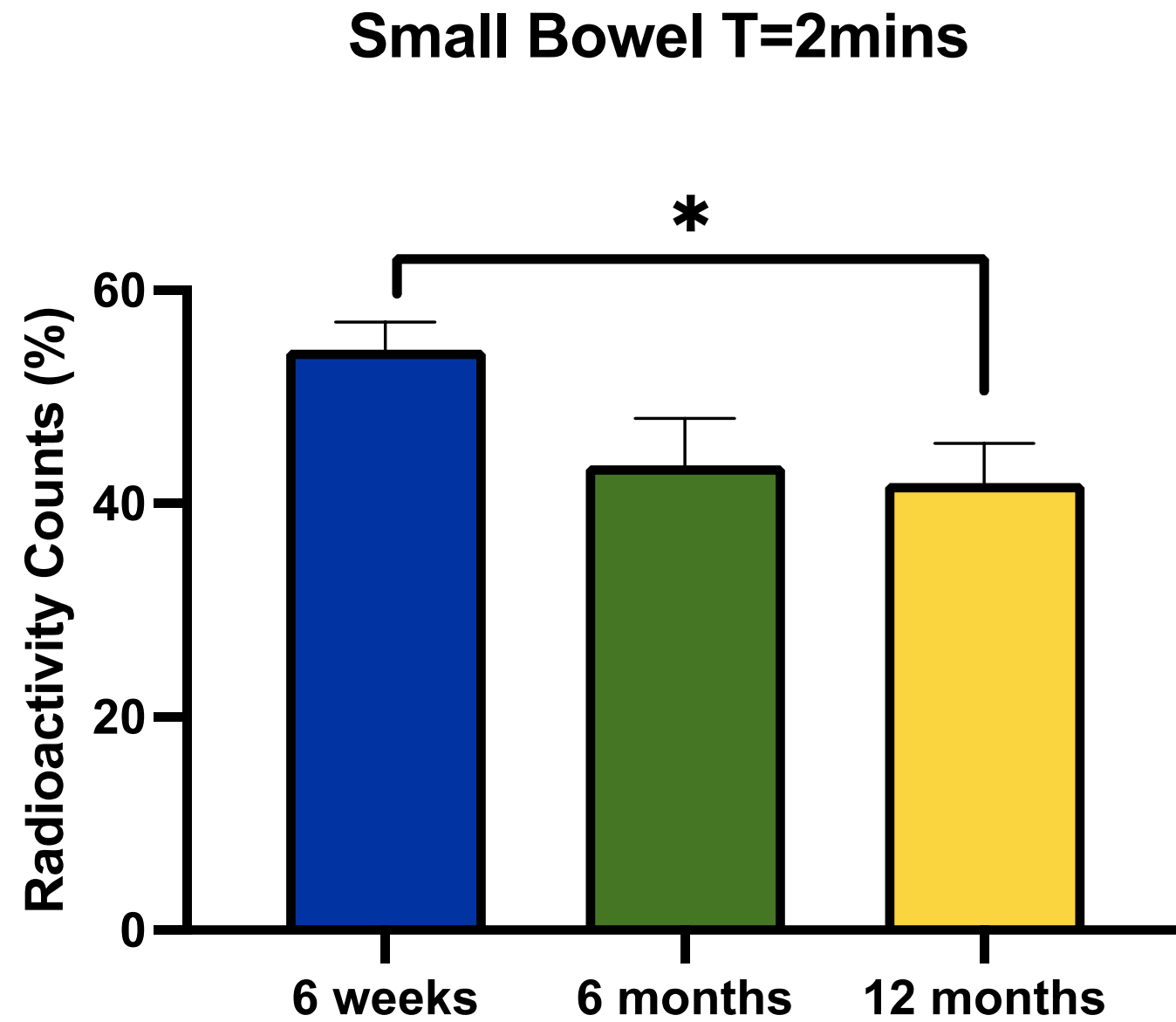
	Obese controls (<i>n</i> = 11)	Baseline	6 weeks	6 months	12 months	<i>p</i> -value*	<i>p</i> -value [^]	<i>p</i> -value [¶]
Age (years)	40.7 ± 13.0	44.8 ± 8.5						
Male/female	1/10	3/10						
Start weight (Kg)	121.0 ± 16.3	133.1 ± 22.9						
Start BMI (Kg/m ²)	45.8 ± 6.6	46.9 ± 6.7						
Diabetes, <i>n</i> (%)	-	0						
Hypertension, <i>n</i> (%)	-	5 (38.5)						
Obstructive sleep apnea, <i>n</i> (%)	-	3 (23.1)						
Reflux, <i>n</i> (%)	-	4 (30.8)						
PPI use, (%)	-	3 (23.1)						
<i>Post-op</i>								
Weight loss (Kg)			16.4 ± 9.8	33.6 ± 13.3	42.5 ± 17.5	0.017	0.872	0.001
Weight at follow-up (Kg)			116.7 ± 16.9	98.8 ± 15.7	87.4 ± 17.6	0.090	0.435	0.090
BMI at follow-up (Kg/m ²)			41.1 ± 4.8	34.4 ± 4.0	30.8 ± 4.2	0.016	0.342	< 0.0001
Percent excess weight loss			25.5 ± 9.5	55.4 ± 17.6	72.6 ± 23.9	0.007	0.470	< 0.0001
Percent total body weight loss			11.9 ± 5.1	24.9 ± 7.2	32.2 ± 10.1	0.015	0.265	< 0.0001

Gastric Emptying study – Intragastric meal distribution (IMD)

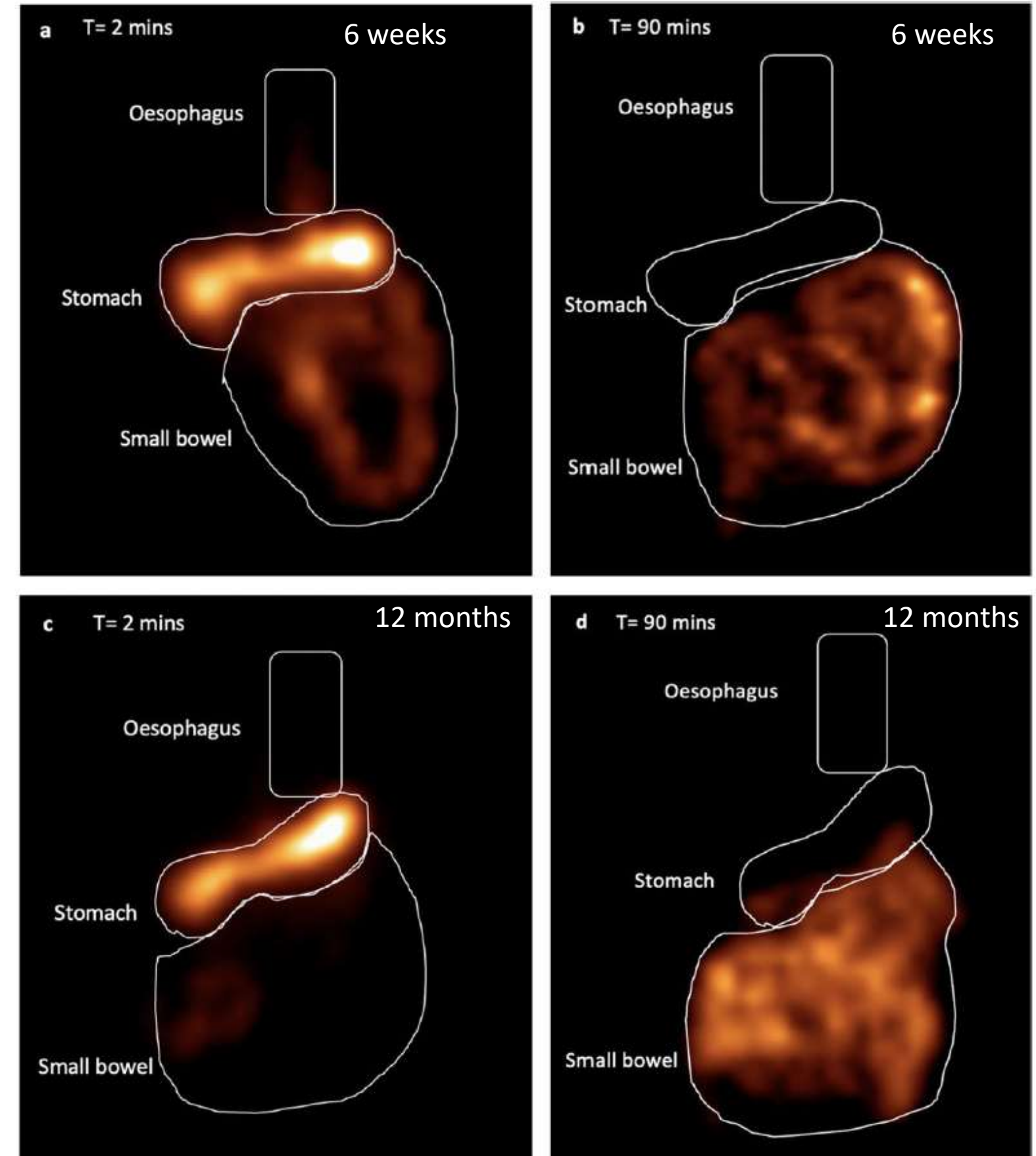
- **Increase** of meal within the proximal stomach; 22.3% (IQR 12%) (6 weeks) vs. 34.2% (IQR 19.7%) (12 months), *p*-value 0.038



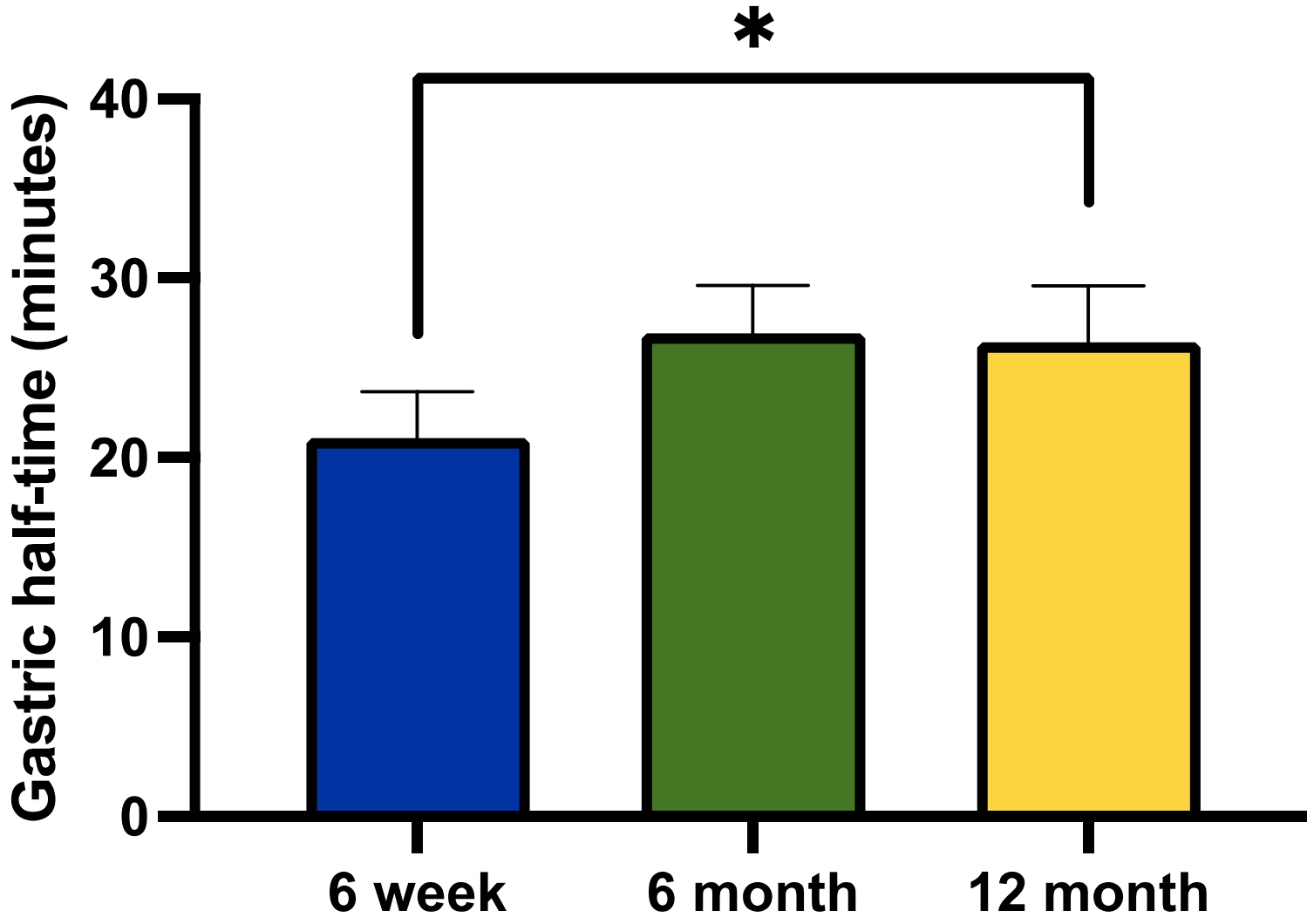
Gastric emptying study- intestinal delivery at T=2mins



- **Slowing** of hyper-accelerated transit of meal into the small bowel

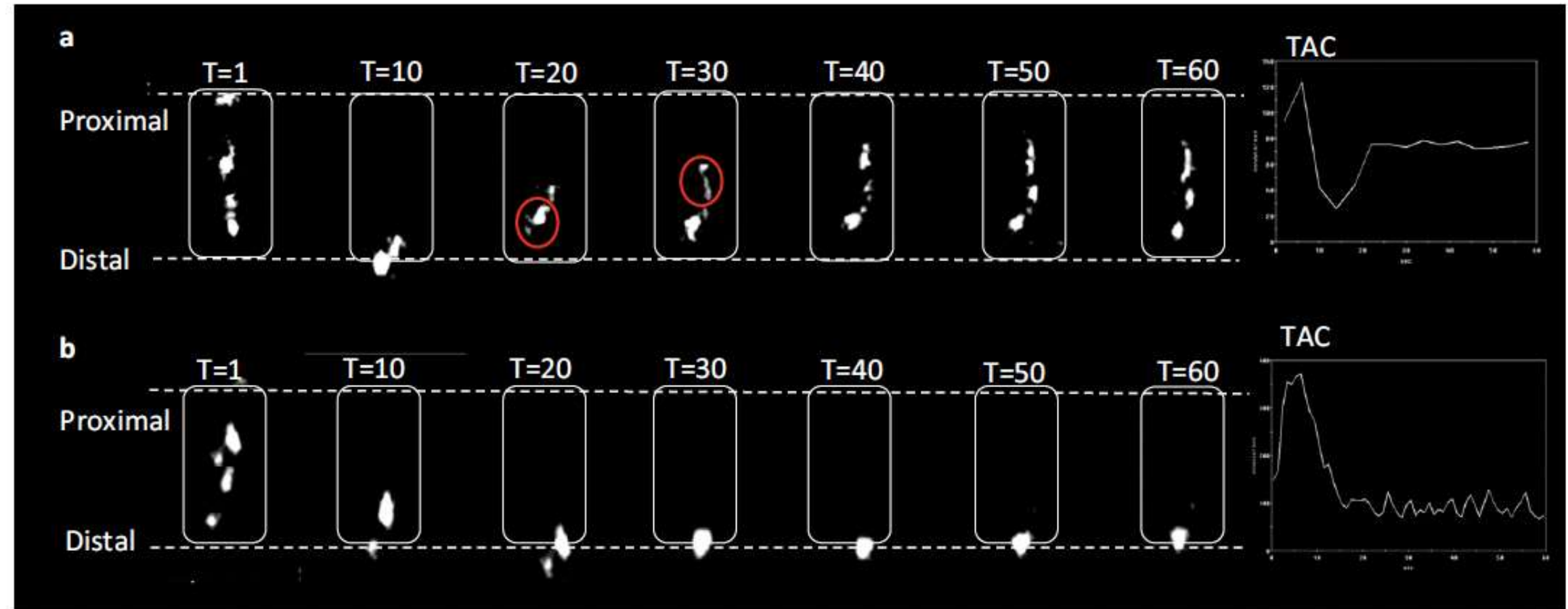
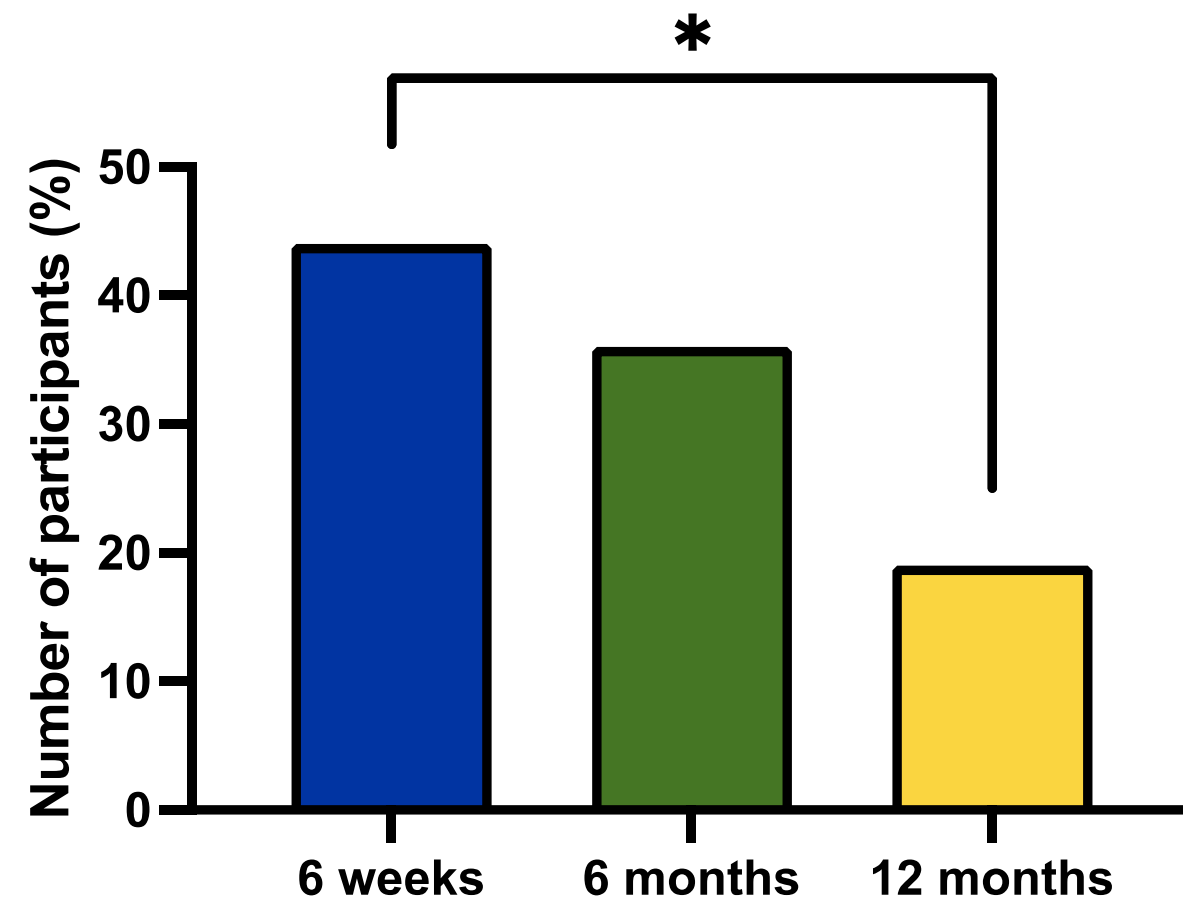


Gastric emptying study- gastric emptying half-time



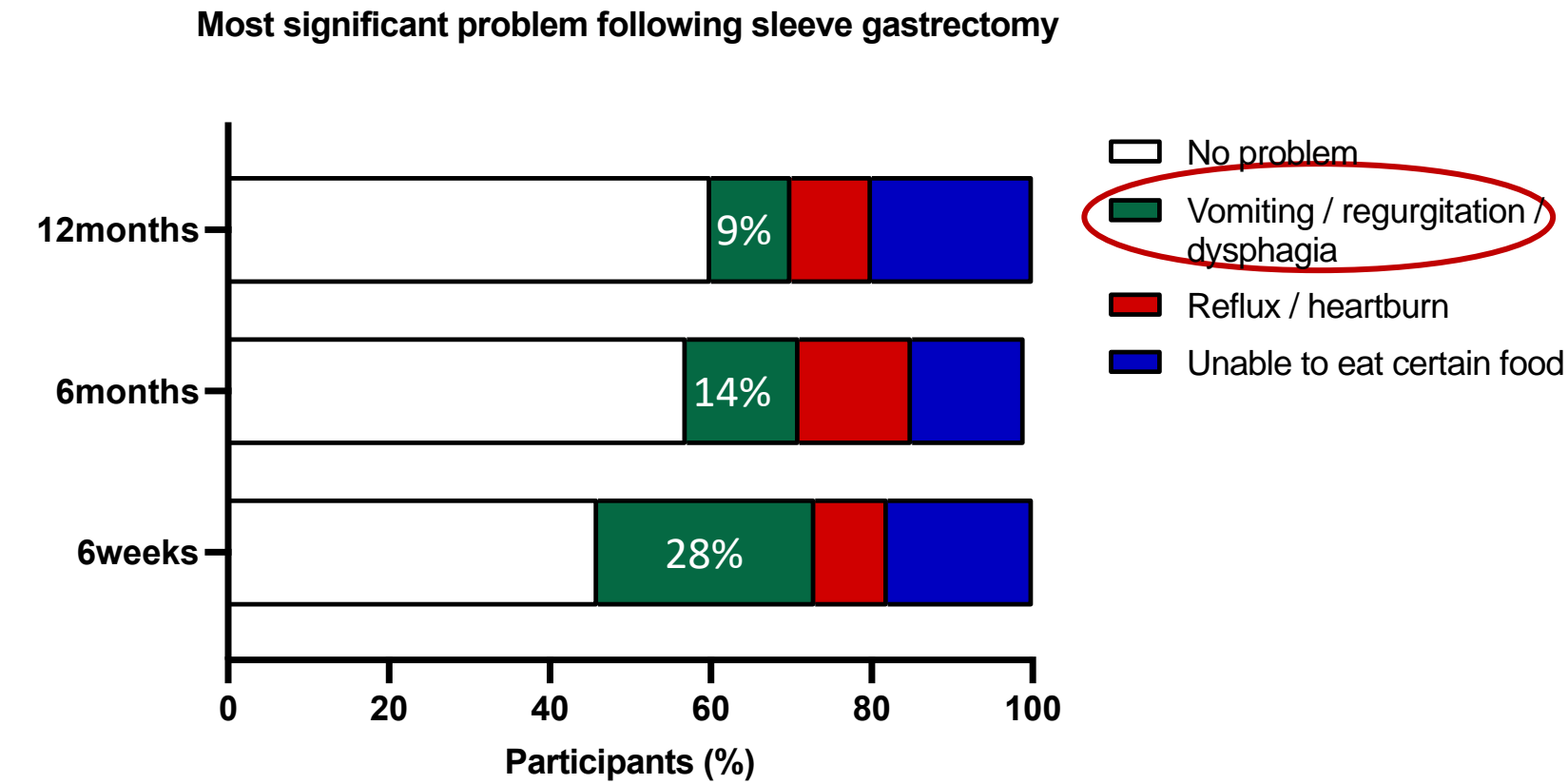
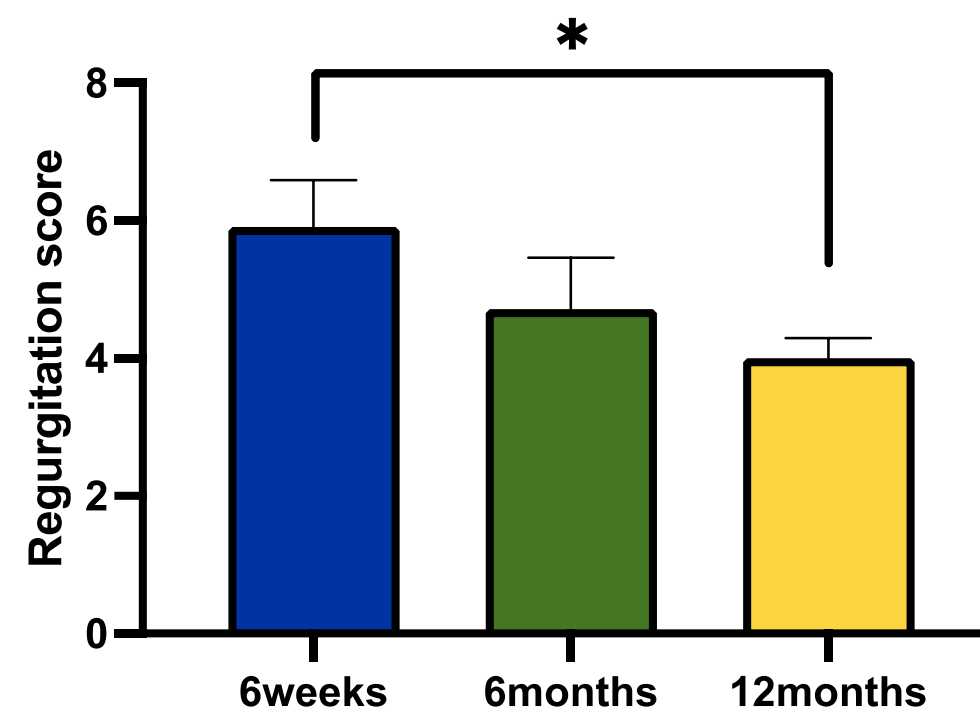
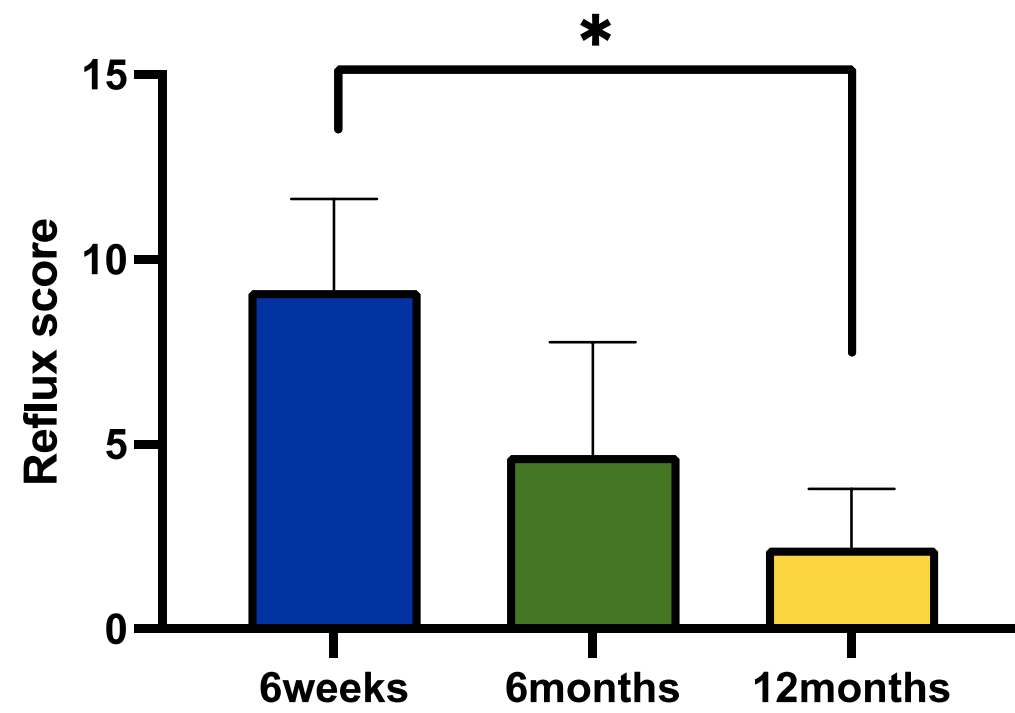
- Increased gastric emptying

Oesophageal Transit study- Deglutitive reflux



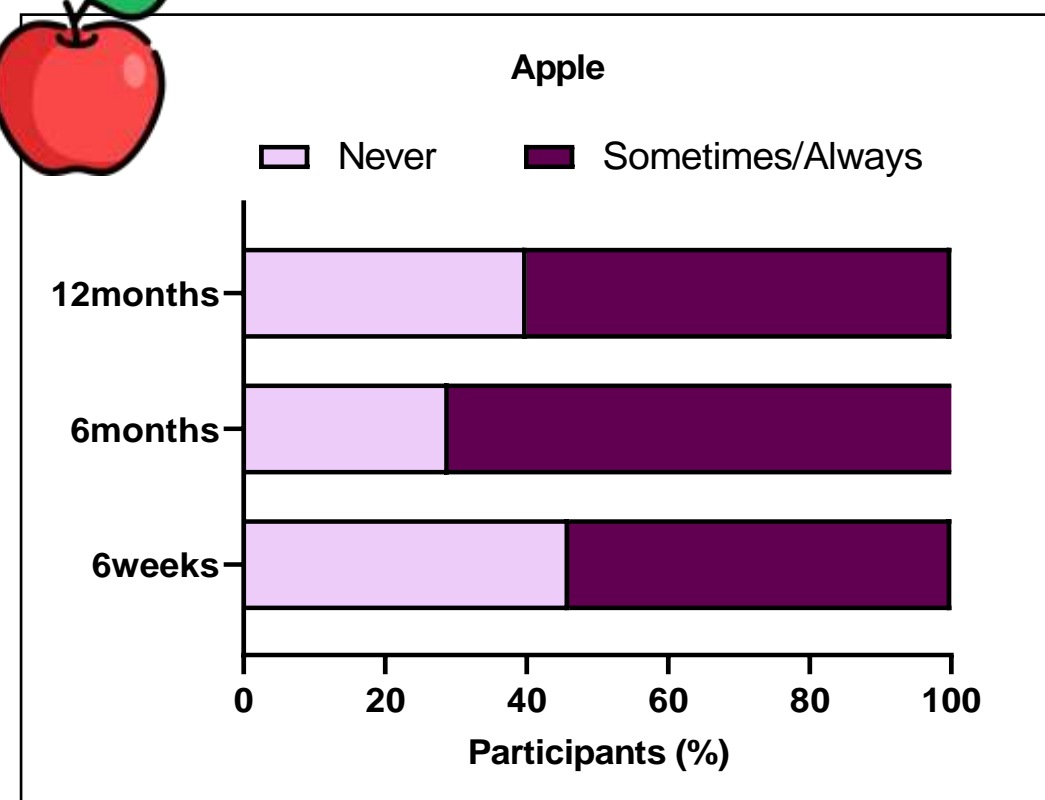
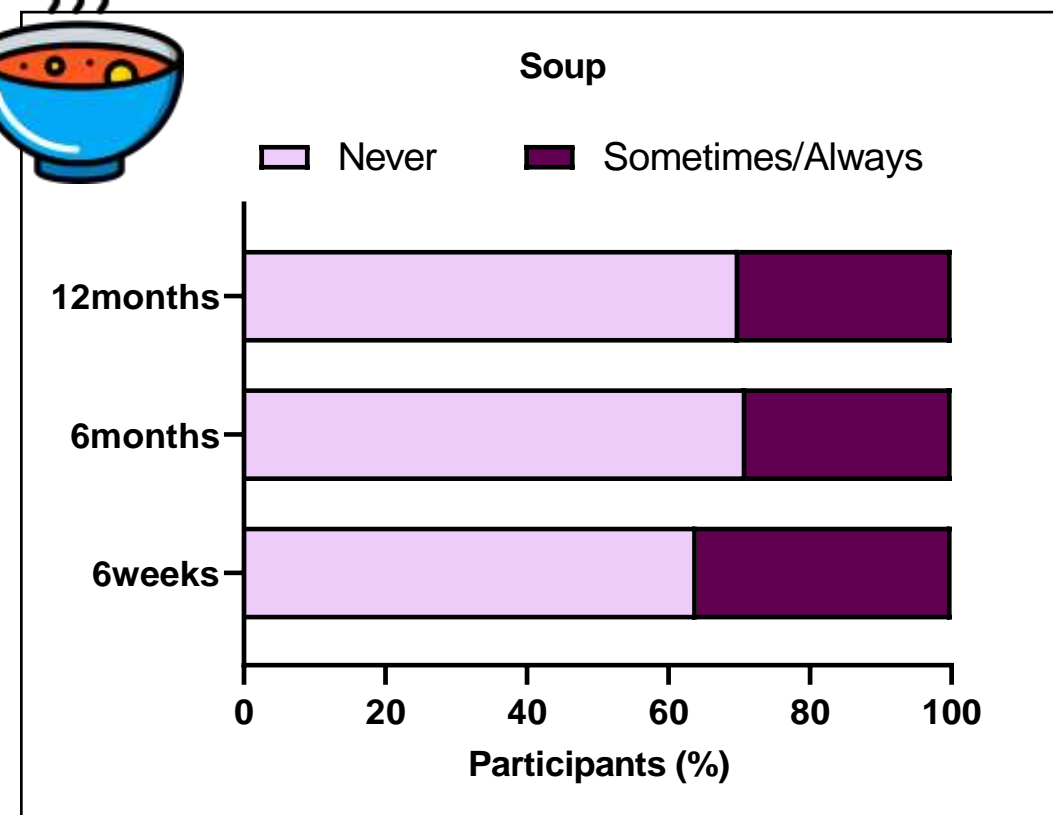
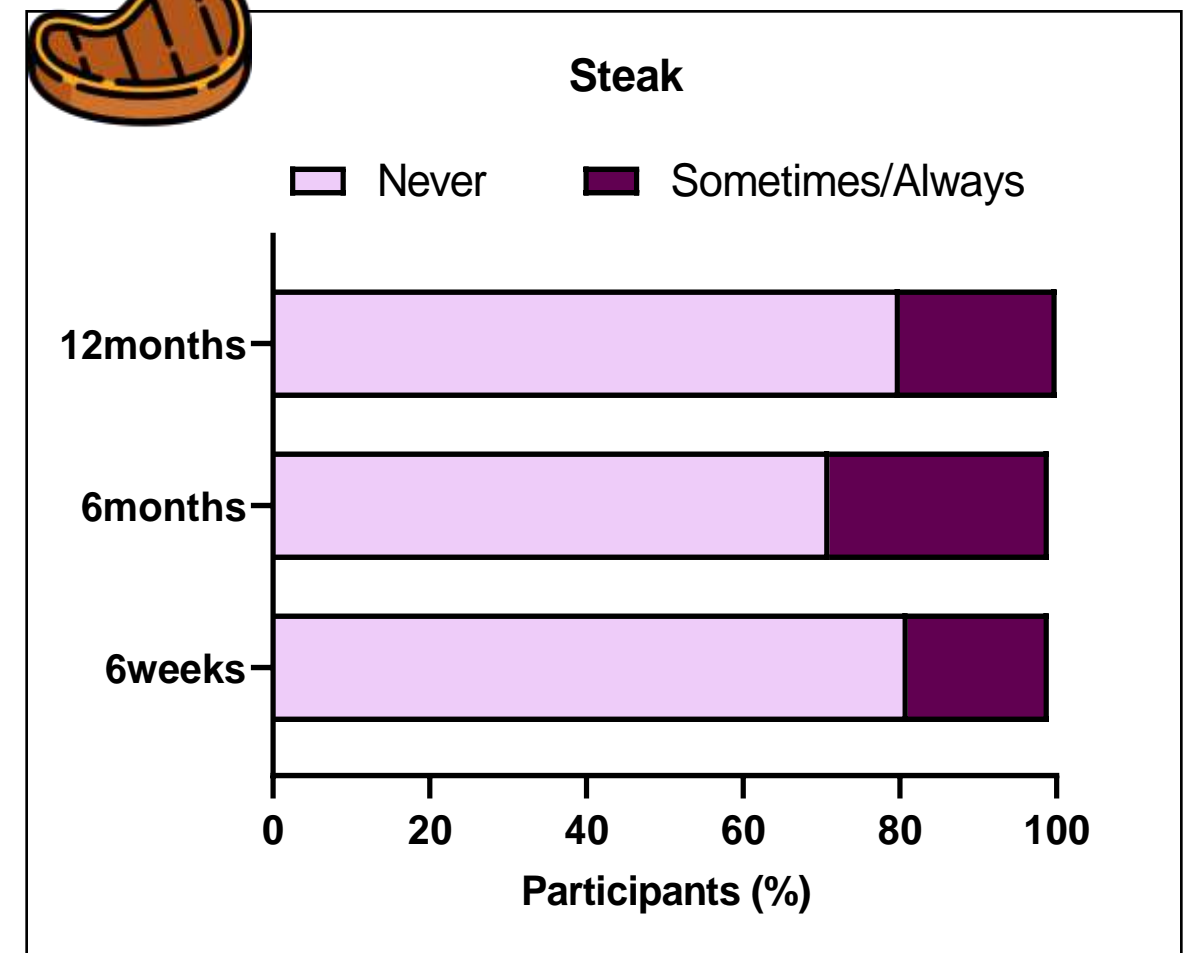
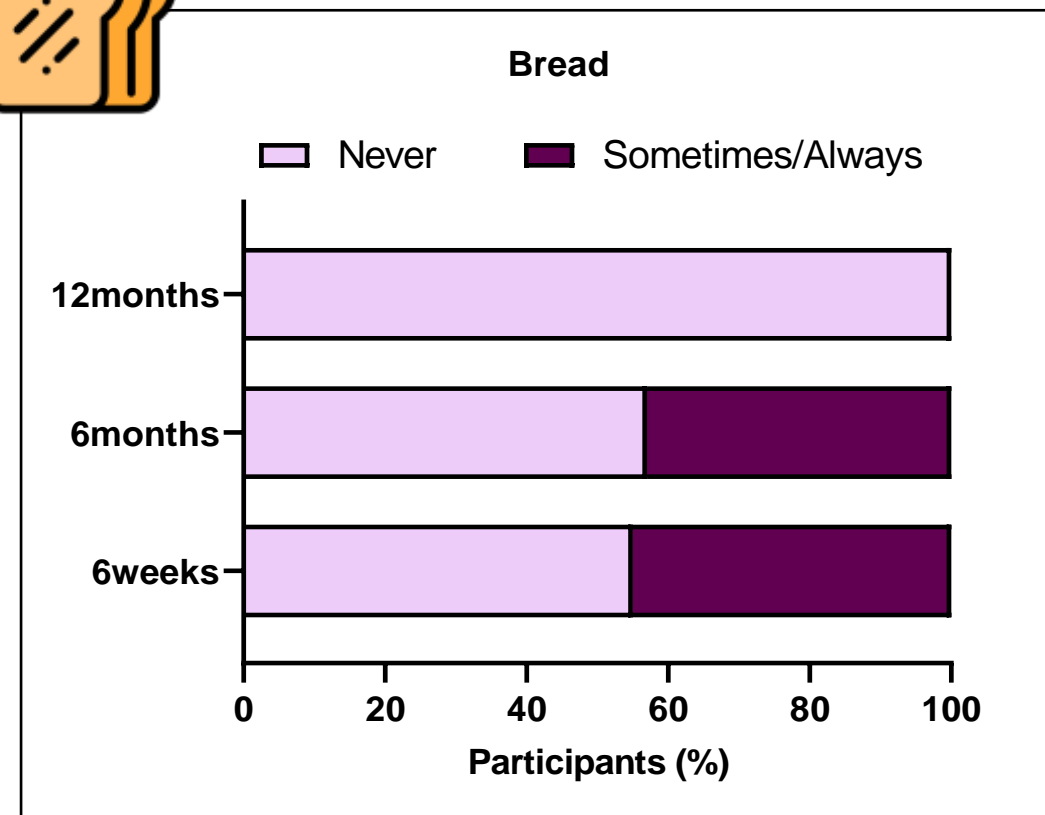
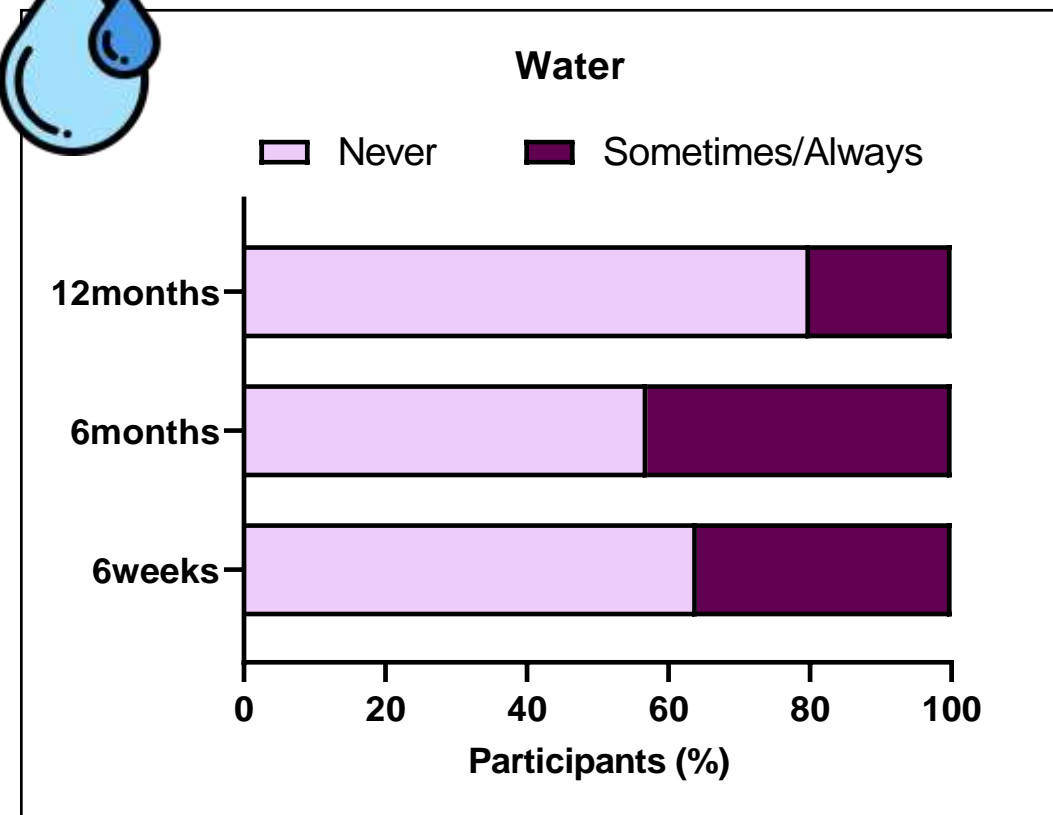
- **Decrease** in reflux of semi-solid swallows

PATIENT REPORTED OUTCOMES - symptoms



- **Improvement** in patient symptoms at 12 months

PATIENT REPORTED OUTCOMES – Food tolerance



SUMMARY AND CONCLUSION

- Gastric emptying and transit remain **rapid** and **hyper-accelerated**; however, demonstrate moderate **reduction** within the first 12 months post-SG.
- There is an **increase** in the **capacity** of the **proximal compartment** of the gastric sleeve to accommodate substrate over 12 months.
- These physiological changes correlate with **improved food tolerance** and **reduced reflux symptoms** over the first year.
- These data provide a potential mechanistically plausible explanation of correlating symptoms and physiology.
- Clinicians can utilise this physiological frame work to aid counselling of patients and provide expectations post SG.
- Nuclear scintigraphy can be used to evaluate patients with significant symptoms in the early phase (i.e. food intolerance and reflux vs visceral hypersensitivity).

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- Ms. Julie Playfair
- Ms. Kalai Shaw



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- Dr. Paul Beech
- Dr. Kenneth Yap
- Ms. Helen Yue



The Royal Melbourne Hospital Department of Gastroenterology

- Professor. Geoff Hebbard

