

Aspects on the functional characteristics of the Roux-limb after Gastric Bypass surgery

Akademisk avhandling

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Avhandlingen baseras på följande delarbeten

- I. Spak E, **Björklund P**, Helander HF, Vieth M, Olbers T, Casselbrant A, Lönroth H, Fändriks L. Changes in the mucosa of the Roux-limb after gastric bypass surgery. *Histopathology* 2010, 57, 680–688.
- II. **Björklund P**, Laurenius A, Een E, Olbers T, Lönroth H, Fändriks L. Is the Roux Limb a Determinant for Meal Size After Gastric Bypass Surgery? *Obes Surg* (2010) 20:1408–1414.
- III. **Björklund P**, Lönroth H, Fändriks L. Manometry of the Upper Gut Following Roux-en-Y Gastric Bypass Indicates That the Gastric Pouch and Roux Limb Act as a Common Cavity. *Obes Surg*. 2015 Oct; 25(10):1833-41.
- IV. **Björklund P**, Maleckas A, Lönroth H, Björnfot N, Thörn SE, Fändriks L. Roux-limb motility in gastric bypass patients with postprandial nausea and abdominal pain – is there an association to prescribed opioids? In manuscript 2017

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INSTITUTIONEN FÖR KLINISKA VETENSKAPER



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Abstract

Background: Bariatric surgery, and particularly the Roux-en-Y Gastric Bypass (RYGBP) procedure, has highlighted the central role of the gastrointestinal tract in the regulation of body weight and metabolism. The Roux-limb is the part of the small intestine that has become the food recipient after RYGBP and has generally been very little studied. The thesis explores mucosal adaptation and muscular activity of this intestinal segment after RYGBP. As there is an increasing awareness of post-surgical chronic abdominal pain and use of opioid analgesics in some patients, the motor patterns in the roux-limb in these conditions were examined as well. **Paper I** compares the mucosa of the preoperative jejunum with the same region in the Roux-limb 6-8 months post-surgery. In the Roux limb, the mucosal villi were flattened with an upregulated epithelial replication rate. No histological signs of inflammation were present, but there was increased expression of proinflammatory markers. In conclusion, after RYGBP the jejunal mucosa changes into an appearance more suited for food reception/ transportation and tissue defence.

Paper II. Mechano-sensory properties of the Roux limb in relation to food intake were examined preoperatively, 6 weeks and 1 year after RYGBP. In general, the preferred meal size decreased after RYGBP and subjects with a low perception threshold in the Roux limb preferred larger meals. Furthermore, the intra-Roux limb pressure correlated negatively to preferred meal size. The results suggest that the Roux limb is determinant for the regulation of food intake after RYGBP.

Paper III. The motor activity of the gastric pouch and the proximal Roux limb during fasting and food intake was examined by use of high resolution manometry in patients after uncomplicated RYGBP. A fasting motility pattern with migrating motility complexes (MMC) starting in the proximal Roux limb was characterised. Food ingestion was associated with a modest intraluminal pressure increase of similar magnitude in the gastric pouch and the Roux limb indicating that the gastric pouch and the Roux limb behave as a common cavity.

Paper IV. In a retrospective analysis of 18 patients with chronic abdominal pain after RYGBP referred to high resolution manometry it was found that only 5/17 were evaluated as normal manometries, but there was no clear association to experienced symptoms. Out of the 18 patients, 13 had longstanding opioid medication suggesting a potential element of narcotic bowel syndrome. In an attempt to elucidate opioid influence on Roux limb motility asymptomatic RYGBP patients was administered morphine intravenously during manometry. The MMC-pattern did not change but the muscular tone increased during morphine infusion. The fact morphine influenced the motor behaviour of the Roux-limb support a role for opioid treatment in causing chronic abdominal pain after RYGBP surgery. However, the links between muscular activity and symptoms remain to be investigated.

Conclusion: This thesis project demonstrates that biomechanical properties and muscular activity of the Roux-limb can be clinically important, and particularly so during dysfunctional conditions.

Keywords: obesity, bariatric surgery, meal size, morphology, intestinal motility, high resolution manometry, abdominal pain, opioid analgesics