

Implications of surgical and endoscopic interventions in the upper GI tract (with focus on management of GERD and Weight Control)

Citation for published version (APA):

van Rijn, S. (2018). *Implications of surgical and endoscopic interventions in the upper GI tract (with focus on management of GERD and Weight Control)*. [Doctoral Thesis, Maastricht University]. Maastricht University. <https://doi.org/10.26481/dis.20180321sr>

Document status and date:

Published: 01/01/2018

DOI:

[10.26481/dis.20180321sr](https://doi.org/10.26481/dis.20180321sr)

Document Version:

Publisher's PDF, also known as Version of record

Please check the document version of this publication:

- A submitted manuscript is the version of the article upon submission and before peer-review. There can be important differences between the submitted version and the official published version of record. People interested in the research are advised to contact the author for the final version of the publication, or visit the DOI to the publisher's website.
- The final author version and the galley proof are versions of the publication after peer review.
- The final published version features the final layout of the paper including the volume, issue and page numbers.

[Link to publication](#)

General rights

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal.

If the publication is distributed under the terms of Article 25fa of the Dutch Copyright Act, indicated by the "Taverne" license above, please follow below link for the End User Agreement:

www.umlib.nl/taverne-license

Take down policy

If you believe that this document breaches copyright please contact us at:

repository@maastrichtuniversity.nl

providing details and we will investigate your claim.

Valorisation addendum

Valorisation addendum

This thesis focuses on two major socio-economic and health burdens; gastroesophageal reflux disease (GERD) and morbidly obesity. The aim was to provide new insight in complications of anti-reflux surgery (ARS) and to provide new treatment options for people with morbidly obesity.

Gastroesophageal reflux disease (GERD)

The prevalence of GERD has increased over the last decades and is still increasing. Prevalence varies world wide from 18%-28% in North America, 9%-26% in Europe, 3%-8% in East Asia, 9%-33% in the Middle East, 11.6% in Australia and 23.0% in South America. With the numbers of patients suffering from GERD rising, the disease has become a serious global socio-economic burden. GERD is the number one given gastrointestinal diagnosis in the US. The costs in the US of proton pump inhibitor usage for acid related disorders are estimated to be 10 billion dollars yearly. PPI use is considered a safe treatment, however risk of pneumonia, intestinal infections, hip fractures and deficiency of vitamin B12, iron and other micronutrients have been reported in long term PPI users.

Surgery as treatment for GERD has proven to be effective and also seems to be a more cost effective alternative over a longer period of time than medical therapy. However, surgery is accompanied by peri- and postoperative complications. In the first part of this thesis we have addressed one of the feared perioperative complications (vagus nerve injury) of ARS and the effect of this complication on the outcome of ARS. We have shown in **chapter 2** and **3** that the occurrence of vagus nerve injury (VNI) resulting from anti reflux surgery is much higher than previously assumed in literature. We have also demonstrated that VNI leads to a higher recurrence rate of symptoms of GERD and subsequently leads to a higher re-operation rate on long term. As previously described in chapter **3**, treatment of patients with VNI who present with recurrent or new onset of reflux symptoms treatment should not consist of re-operation because of poor efficacy and other pathophysiological mechanisms that are involved, such as delayed gastric emptying. Our observations and findings are relevant for decision making in clinical practice. Patients with persistent or new complaints after ARS will more frequently consult the gastroenterologist or surgeon, will use more medication, will undergo mores tests or surgical re-interventions which results in a higher burden on healthcare costs. It is therefore of importance to investigate these causes and consequences of these complications and provide better solutions or alternative treatment options. With these complications in mind, new techniques have emerged as an alternative to current standard surgical procedures (Nissen and Toupet fundoplication). Although early results are promising, longer term efficacy and safety need improvement. These techniques have not yet been able to reach the same level of success rate as the

current standard surgical procedures. Hopefully, future development and research will provide us with safer and more effective treatment options. Awareness for occurrence of vagal nerve injury due to antireflux surgery should increase as well as the clinical consequences with poorer outcome, serious side effects and lower efficacy of redo surgery.

Overweight and Obesity

Overweight (BMI 25-30 kg/m²) and obesity (BMI >30 kg/m²) have become pandemic. Approximately 1.9 billion adults are overweight or obese, while 462 million are underweight. Obesity does not only have a large social impact but is also responsible for a tremendous economic burden. USA national medical care costs related to obesity have been estimated to be around 210 billion USD, which accounts for approximately 20% of the total annual US healthcare expenditures. More important obesity is associated with a higher risk of developing metabolic disorders (Diabetes Mellitus), cardiovascular disorders, sleep apnea, arthrosis, degradation of musculoskeletal organs and cancer all adding up to the socio-economic burden. Bariatric surgery (sleeve gastrectomy, roux-y gastric bypass) has proven to be most effective and cost beneficial in the treatment of obesity compared to non-surgical techniques. Although these procedures are highly effective in decreasing weight and reducing obesity associated comorbidities they are still accompanied with complications. More importantly, according to current guidelines on bariatric surgery only patients with a BMI≥35 kg/m² with comorbidities or patients with a BMI≥40 kg/m² are considered eligible for surgery leaving a considerable large group of patients untreated. Therefore, to broaden the therapeutic range and further minimize complications new bariatric techniques that are less invasive have been developed. In the second part of this thesis (**chapter 4-7**) we focus on several of these new minimal invasive techniques and investigated both their safety and effectiveness. Most of the investigated new bariatric techniques in this thesis have shown beneficial effects on obesity and its comorbidities on short term and show lower complication rates. However, current standard bariatric techniques are still superior in the treatment of obesity. Further development and investigation of these less invasive new techniques is of high importance to be able to provide a solution for the ever growing overweight population and the accompanying socio-economic burden.