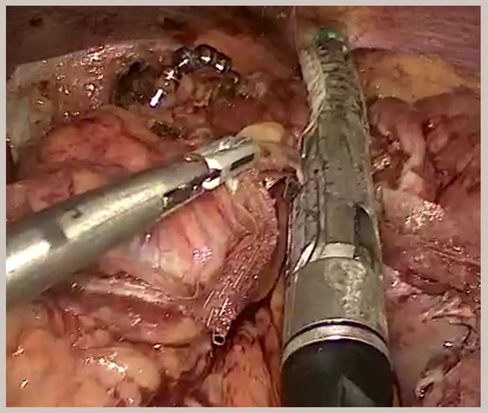
SLEEVE GASTRECTOMY, HIATAL HERNIA REPAIR, AND MAGNETIC SPHINCTER AUGMENTATION (LINX) AS A COMBINED PRIMARY PROCEDURE FOR OBESE PATIENTS WITH HIATAL HERNIA AND REFLUX

George Woodman MD[1], Jacob Gubin MS[2], Guy Voeller MD[3]

[1]George Woodman MD, PC, [2]College of Osteopathic Medicine, [3]Baptist Memphis Hospital

Introduction

- Bariatric patients commonly present with gastroesophageal reflux disease (GERD).
- Sleeve gastrectomy is the most performed bariatric procedure, but GERD can worsen or develop de novo after vertical gastrectomy. Gastric bypass risks life-long complications not seen with sleeve gastrectomy, and the effectiveness of bypass treating reflux remains questionable.
- Magnetic sphincter augmentation (LINX) is an FDA-approved treatment for GERD in the post-sleeve gastrectomy patient who develops significant reflux.[1–3]
- Eight patients presented with severe obesity, large hiatal hernia, and GERD requiring medication and who wished to have sleeve gastrectomy as their bariatric procedure. All eight patients were treated with laparoscopic repair of their hiatal hernia, LINX, and sleeve gastrectomy in one operative procedure.



LINX + Sleeve

Methods and Procedures

- All patients underwent standard preoperative evaluation for bariatric surgery and were given informed consent regarding options for bariatric procedures. Multiple options were presented including, but not limited to, laparoscopic gastric bypass as well as repair of hiatal hernia + sleeve gastrectomy + magnetic sphincter augmentation in one combined procedure.
- All patients had EGD, UGI, or manometry for evaluation of their GERD and hiatal hernia. No pH or impedance was required, and marshmallow-bagel testing was done if manometry was borderline or unavailable.
- GERD-HRQL Quality of Life scoring data was collected.[4]
- The sequence of surgery was hiatal hernia repair, LINX device placement, and then sleeve gastrectomy.

GERD Health-Related Quality of Life (GERD-HRQL) Questionnaire

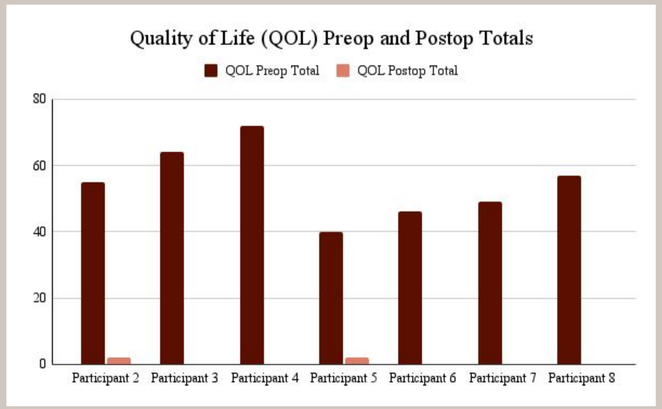
Scale:
0=No Symptoms 1=Noticeable, but not bothersome 2=Noticeable, bothersome, but not every day
3=Bothersome daily 4=Bothersome and affects daily activities 5=Incapacitating to do daily activities

Questions (Circle One):

How bad was the heartburn?	0	1	2	3	4	5
Heartburn when lying down?	0	1	2	3	4	5
Heartburn when standing up?	0	1	2	3	4	5
Heartburn after meals?	0	1	2	3	4	5
Does heartburn change your diet?	0	1	2	3	4	5
Does heartburn wake you from sleep?	0	1	2	3	4	5
Do you have difficulty swallowing?	0	1	2	3	4	5
Do you have pain while swallowing?	0	1	2	3	4	5
Do you have gassy or bloating feeling?	0	1	2	3	4	5
If you take reflux medication, does this affect your daily life?	0	1	2	3	4	5
TOTAL SCORE (enter total here; 50 points total) _____						
How bad is the regurgitation?	0	1	2	3	4	5
Regurgitation when lying down?	0	1	2	3	4	5
Regurgitation when standing up?	0	1	2	3	4	5
Regurgitation after meals?	0	1	2	3	4	5
Does regurgitation change your diet?	0	1	2	3	4	5
Does regurgitation wake you from sleep?	0	1	2	3	4	5
How satisfied are you with your current health condition?	Satisfied___		Neutral___		Dissatisfied___	

Results

- Eight patients were treated over a 14-month period. Seven were female. Average age, BMI, and weight were 49.9 years, 48 kg/m2, and 300.4 lbs.
- Average operative time was 173 minutes with all patients discharged home the following morning under 23-hour observation guidelines. No immediate complications occurred, and to date no surgical complications have developed.
- Weight loss has been consistent with our previously published data.[5]
- GERD-HRQL scoring (total, heartburn, and regurgitation) preoperatively was 56.4, 34.1, and 22.3 and postoperatively 0.7, 0.7, and 0. No patients are taking oral antireflux medication postoperatively for symptoms.



Conclusion

Combined hiatal hernia repair plus magnetic sphincter augmentation plus sleeve gastrectomy as a primary treatment of obese patients with hiatal hernia and GERD can be done with minimal morbidity and results in significant improvement in GERD-HRQL scores postoperatively.

References

1. Broderick, R., Cheverie, J., Horgan, S., Jacobsen, G., Sandler, B., & Lee, A. Avoiding conversion to RYGB with LINX® placement after sleeve gastrectomy. *Surgery for Obesity and Related Diseases* 2019; 15: S255-S268.
2. Hawasli, A., Tarakji, M., & Tarboush, M. Laparoscopic management of severe reflux after sleeve gastrectomy using the LINX® system: Technique and one year follow up case report. *International Journal of Surgery Case Reports* 2017; 30: 148-151.
3. Hawasli, A. & Hallowell, S. The effectiveness of the magnetic ring (LINX®) Device in managing reflux after sleeve gastrectomy; long term results: a seven-years' experience. *Mini-invasive Surgery* 2023; 7: 4.
4. Chan, Y, et al. Development and validation of a disease-specific quality of life questionnaire for gastro-oesphageal reflux disease: the GERD-QOL questionnaire. *Alimentary Pharmacology & Therapeutics*, 2009.
5. Woodman, G. & Voeller, G. Sleeve gastrectomy performed with single staple height and bioabsorbable reinforcement in a single surgeon >2500 consecutive case series: Is smart technology necessary? *Obesity Surgery* 2002; 32: 690-695.