AXA Health

Evidence review #4
6 October 2020

LINX

Is LINX for reflux safe and effective and for what indications?

Background

The LINX system is a medical device designed for chronic gastro-oesophageal reflux disease. The LINX is a small flexible band of titanium beads with magnetic cores, which is placed around the lower oesophageal sphincter during a laparoscopic procedure.

The Linx device receives CE marking in April 2010, and FDA PreMarket Approval in March 2012 (link) FDA summary of safety and effectiveness (link)

Summary of the evidence

NICE Interventional procedures guidance states there are no major safety concerns about laparoscopic insertion of a magnetic titanium ring for gastro-oesophageal reflux disease (GORD). There is limited evidence of short-term efficacy, but evidence of long-term efficacy is inadequate in quality and quantity. Therefore, this procedure should only be used with special arrangements for clinical governance, consent, and audit or research.

Most studies on Magnetic Sphincter Augmentation lack information about patient selection, techniques and outcomes, which vary substantially between studies. It is currently being used despite a lack of robust evidence for its effectiveness.

The NICE update in 2019 did not specifically recommend any surgical device for the treatment of gastro-oesophageal reflux disease.

There are several trials underway that will influence the NICE guidance and there is a requirement to audit and review clinical outcomes of all patients having the procedure.

The NICE guideline in 2019 indicates that fundoplication is the surgical intervention of choice.

The NICE update in 2019 (new recommendation) for fundoplication states it should be for those where there is a confirmed diagnosis of acid reflux and symptoms that are responding to a PPI, but who cannot tolerate acid suppression therapy.

Recommendation

The LINX device level of evidence is amber due to the lack of randomised controlled trial evidence and the need for long term data on safety.

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Evidence: guidelines

2014 NICE guideline: "Gastro-oesophageal reflux disease and dyspepsia in adults: investigation and management". The same guideline indicates that fundoplication is the surgical intervention of choice. (The guideline was last updated: 18 October 2019).

1.10 Laparoscopic fundoplication

1.10.1Consider laparoscopic fundoplication for people who have:

- a confirmed diagnosis of acid reflux and adequate symptom control with acid suppression therapy, but who do not wish to continue with this therapy long term
- a confirmed diagnosis of acid reflux and symptoms that are responding to a PPI, but who cannot tolerate acid suppression therapy. [new 2014]

In 2017 NICE published "Laparoscopic insertion of a magnetic titanium ring for gastro-oesophageal reflux disease" and made the following recommendations:

"*1.1 There are no major safety concerns about laparoscopic insertion of a magnetic titanium ring for gastro-oesophageal reflux disease (GORD). There is limited evidence of short-term efficacy, but evidence of long-term efficacy is inadequate in quality and quantity. Therefore, this procedure should only be used with special arrangements for clinical governance, consent, and audit or research.*

1.2 Clinicians wishing to do laparoscopic insertion of a magnetic titanium ring for GORD should:

- *Inform the clinical governance leads in their NHS trusts.*
- *Ensure that patients understand the uncertainty about the procedure's long-term efficacy and provide them with clear written information. In addition, the use of NICE's information for the public is recommended.*
- *Audit and review clinical outcomes of all patients having the procedure (see section 7.1).*

1.3 This procedure should only be done by a clinician trained in upper gastrointestinal laparoscopy and with expertise in fundoplication procedures.

1.4 NICE encourages further research into laparoscopic insertion of a magnetic titanium ring for GORD and may update the guidance on publication of further evidence. Long-term outcome data and comparative trials with other anti-reflux surgery would be helpful."

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Evidence: systematic reviews

Since 2017 there have been four systematic reviews of the evidence and a Health Evidence Review Commission.

2018: Early results of magnetic sphincter augmentation versus fundoplication for gastroesophageal reflux disease: Systematic review and meta-analysis Reports on short-term (one year) data. It reports "*Both anti-reflux procedures are safe and effective up to 1-year follow-up. PPI suspension rate, dysphagia requiring endoscopic dilatation, and disease-related quality of life are similar in the two patient groups.*" Seven observational cohort studies (n=1,211); 686 Magnetic Sphincter Augmentation, and 525 Laparoscopic Nissen and Toupet fundoplication were published between 2014 and 2017 were included. Postoperative morbidity ranged from 0 to 3% in the MSA group and from 0 to 7% in the LF group, there was no mortality. Dysphagia requiring endoscopic dilatation occurred in 9.3% and 6.6% of patients respectively (OR = 1.56, 95% CI = 0.61-3.95, p = 0.119).

2019: Laparoscopic magnetic sphincter augmentation versus fundoplication for gastroesophageal reflux disease: systematic review and pooled analysis which concludes "*There is an urgent need for randomized data directly comparing fundoplication with MSA for the treatment of GERD to truly evaluate the efficacy of this treatment approach.*" The systematic review identified six comparative studies of MSA versus fundoplication and 13 single-cohort studies. 3.3% of patients required device removal.

2019: Newer Interventional Procedures for GERD (2019) published by Oregon's Health Evidence Review Commission. They report on a number of potential outcomes before concluding:

Balance of benefits and harms: Although MSA appears to have similar effectiveness and similar adverse events and complications compared to laparoscopic fundoplication, we have very low confidence in the evidence.

Rationale: Based on observational studies and one poor-quality RCT, the level of evidence is insufficient at present to establish the comparative effectiveness of MSA. Some additional costs would be likely with the addition of MSA coverage, and there are no strong values or preferences that would favor MSA over other available GERD treatment options. Our recommendation for non-coverage is weak because future studies may better establish the benefits of the MSA procedure.

Recommendation: Magnetic sphincter augmentation for treatment of GERD is not recommended for coverage (weak recommendation).

The review also highlights that organisations such as Aetna, Cigna and Regence do not provide coverage.

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Evidence: systematic reviews

2020: LINX® reflux management system to bridge the "treatment gap" in gastroesophageal reflux disease: A systematic review of 35 studies concludes:

"*The findings of our review suggest that MSA has the potential to bridge the treatment gap between maxed-out medical treatment and LF. However, further studies with longer follow-up are needed for a better elucidation of these results.*" Overall, 35 studies with 2,511 MSA patients were included and analyzed. The most common postoperative complication was dysphagia ranging between 6% and 83%. Dilation due to dysphagia occurred in 8% of patients with typical inclusion criteria. Esophageal erosion may occur in up to 0.03% of patients.

2020: Finally, the British Journal of Surgery published a Systematic review of the introduction and evaluation of magnetic augmentation of the lower oesophageal sphincter for gastro-oesophageal reflux disease which concluded:

"*Most studies on MSA lacked information about patient selection, governance, expertise, techniques and outcomes, or varied between studies. Currently, MSA is being used despite* a lack of robust evidence for its effectiveness." Searches identified 587 abstracts; 39 full-text papers were included (1 RCT 5 cohort, 3 case–control, 25 case series, 5 case reports). Follow-up ranged from 4 weeks to 5 years; in 14 studies, it was less than 1 year.

Evidence: ongoing trials

We found eleven trials registered on ClinicalTrials.gov of which six have been completed but only three have reported results. There are two actively recruiting with long-term completion dates (2025 and 2032).