Effects of adjustable gastric banding on gastroesophageal reflux and esophageal motility: a systematic review

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CRD summary
This review concluded that adjustable gastric banding had anti-reflux properties, but worsening or newly developed reflux symptoms and oesophagitis were found in a subset of patients. Methodological limitations within the review, particularly the lack of quality assessment and lack of significance testing, make it difficult to verify the authors' conclusions, which may not be reliable.

Authors' objectives
To investigate the effects of adjustable gastric banding on gastro-oesophageal reflux and oesophageal motility.

Searching
Published trials and abstracts in English were identified through a search of MEDLINE and EMBASE from 1990 to December 2008. Search terms were reported. Abstracts from three major scientific meetings on surgical treatment of morbid obesity and reference lists of retrieved articles were also searched.

Study selection
Prospective studies that investigated the influence of adjustable gastric banding on gastro-oesophageal reflux and oesophageal motility in obese adult patients were eligible for inclusion. Studies were required to report preoperative and postoperative data for reflux symptoms (like heartburn and regurgitation), medication use, pH recordings and manometry. Only studies in which postoperative results were reported in more than 75% of the patients were included.

The mean age of included patients ranged from 36 to 45. At least three times as many women underwent gastric banding than men in all included studies. Surgical techniques for gastric band positioning included equal proportions of perigastric and pars flaccida approaches.

Two reviewers independently selected studies for inclusion. Disagreements were resolved through discussion.

Assessment of study quality
The authors did not state that they assessed validity.

Data extraction
Two independent reviewers extracted data on reflux symptoms, medication use, oesophagitis, pH monitoring, and manometry; disagreements were resolved by discussion.

Methods of synthesis
Means and ranges were calculated. Studies were reported narratively, supported by tables.

Results of the review
Twenty studies (n=3,307 patients) were included in the review. Sample sizes of included studies ranged from 26 to 838 patients. Follow-up duration ranged from six to 59.3 months, although most studies followed patients from six to 24 months.

Reflux symptoms and use of medication (18 studies): A decrease in reflux symptoms following adjustable gastric banding was found in all studies reporting this outcome (15 studies), from an average of 33% (range 16 to 57%) down to 8% (range 0 to 27%). All five studies that reported antacid use showed a decrease. Newly developed reflux symptoms following gastric banding were found in 15% (range 6 to 50%) of patients. An increase in regurgitation was found in three studies.
**pH monitoring** (four studies): Pathological reflux was found in 56% (range 35 to 77%) of patients preoperatively, and decreased to 29% (range 0 to 42%) postoperatively. The mean total reflux time increased in two studies. Pathological reflux developed in 14% and 30% of patients in two studies.

**Oesophagitis** (five studies): Gastric banding decreased oesophagitis in four studies from an average of 33% (range 19 to 62%) to 25% (range 2 to 60%), and increased oesophagitis in one study from 22 to 36%. New-onset oesophagitis was observed in an average of 23% (range 0 to 38%) of patients in three studies. Gastric banding resulted in healing of oesophagitis in 38 to 90% of patients in three studies.

**Oesophageal motility** (six studies): Four studies reported impaired oesophageal peristalsis following band placement. Five studies found an increase in pressure of the lower oesophageal sphincter from an average of 12.1mmHg to 16.7mmHg (range 6 to 22).

**Authors' conclusions**
Adjustable gastric banding had anti-reflux properties that resulted in the resolution or improvement of reflux symptoms, normalised pH monitoring results, and decreased oesophagitis in the short term. However, worsening or newly developed reflux symptoms and oesophagitis were found in a subset of patients during longer follow-up.

**CRD commentary**
This review addressed a clear question supported by appropriate inclusion criteria. Relevant databases were searched and attempts were made to identify unpublished data, although the restriction to English language studies, which increased the possibility of missing potentially important information. Publication bias was not considered in the report. It appeared that suitable methods to minimise risk of reviewer error and bias were reported for study selection and data extraction.

It was unclear why significance tests of the preoperative and postoperative change in means were not reported; some such analyses were reported for individual studies in the text, but without clearly reported t-test outcomes it was difficult to assess the significance of the synthesis.

Methodological limitations within the review, particularly the lack of quality assessment and lack of significance testing, make it difficult to verify the authors' conclusions, which may not be reliable.

**Implications of the review for practice and research**
**Practice:** The authors did not state any implications for practice.

**Research:** The authors stated that functional testing of the upper gastrointestinal tract after long-term follow-up is required, focusing on the mechanisms in which gastric banding influences gastro-oesophageal reflux and on which factors are responsible for newly developed reflux symptoms.

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