Use of self-expandable stents in the treatment of bariatric surgery leaks: a systematic review and meta-analysis

Puli SR, Spofford IS, Thompson CC

CRD summary
The review concluded that self-expanding stents were minimally invasive, safe and effective alternatives in the management of leaks after bariatric surgery and can minimise the need for surgical revision and improve patient outcomes. The evidence base for the review was based on case series of uncertain quality; hence, the authors’ conclusions seem too strong and may not be reliable.

Authors’ objectives
To determine the safety and effectiveness of self-expandable stents in the treatment of bariatric surgery leaks.

Searching
PubMed, EMBASE, CINAHL, DARE, ACP Journal Club, IPA, HealthStar and Cochrane Central Register of Controlled Trials (CENTRAL) were searched from inception to January 2010. Search terms were reported. Major gastroenterology journals were handsearched.

Study selection
Studies (any design) of self-expanding stents for the treatment of acute anastomotic leaks that resulted from any type of bariatric surgery were eligible for inclusion. Studies in which stents were placed for anastomotic strictures or established fistulae were excluded.

The included studies considered patients who underwent several types of bariatric surgery that included Roux-en-Y bypass, sleeve gastrectomy alone, duodenal switch alone, sleeve gastrectomy with duodenal switch, biliopancreatic diversion and vertical banded gastroplasty. Leak locations included the gastric pouch, gastrojejunal and gastric anastomosis, and gastroesophageal junction. Various types of stent were studied (PolyFlex, Ultraflex, Silky oesophageal, Hanarostent, Ella Boubella, Alveolus and Niti-S). Publication dates ranged from 2006 to 2009.

Two reviewers independently performed study selection.

Assessment of study quality
Study quality was not assessed as the authors felt there was no consensus on how to appraise the quality of case series.

Data extraction
Data were extracted on proportion of surgery leak closures, proportion of stent removals after leak closure and stent migration. Safety outcomes were extracted.

Two reviewers extracted data independently. Study authors were contacted for missing data.

Methods of synthesis
Fixed-effect meta-analysis was undertaken to calculate pooled proportions of leak closure and 95% confidence intervals (CIs) for each outcome. Statistical heterogeneity was assessed using the Cochran Q statistic. Random effects meta-analysis was undertaken. Publication bias was assessed using funnel plots, Harbord-Egger and Begg-Mazumdar indices.

Results of the review
Seven uncontrolled case series (67 patients) were included in the review. There was no evidence of publication bias.

With self-expanding stents the pooled proportion of successful leak closure was 87.8% (95% CI, 79.4% to 94.2%; seven studies) and the pooled proportion of successful removal of the stent after leak closure was 91.6% (95% CI, 84.2% to 96.8%; seven studies). The most common reason for stent failure was stent migration (proportion 16.9%, 95% CI 9.3% to 26.3%).
Self-expanding stents were well tolerated and adverse events were generally mild and transient. Re-stenting of one or more patients was required in four of the studies. There was no stent associated mortality.

**Authors’ conclusions**
Endoscopic placement of self-expanding stents were a minimally invasive, safe and effective alternative in the management of leaks after bariatric surgery and can minimise the need for surgical revision and improve patient outcomes.

**CRD commentary**
Inclusion criteria for the review were broadly defined and several relevant databases were searched. The authors did not state whether any language restrictions were imposed, so the risk of language bias was unclear. Publication bias was assessed and was not detected but it should be noted that reviews of case series are inherently at high risk of publication bias. Attempts were made to reduce reviewer error and bias throughout the review. No quality assessment was undertaken, which makes assessing the quality of the evidence base difficult. Only case series were included (generally considered lower quality evidence).

The authors noted that all of the studies were small observational studies. Studies were combined using fixed-effect meta-analysis. Statistical heterogeneity was assessed. There were differences across the studies in terms of surgery type, which may have introduced clinical heterogeneity into the review and may mean that the data were not suitable for pooling.

Given that the evidence base for the review was based on case series of uncertain quality, the authors’ conclusions seem too strong and may not be reliable.

**Implications of the review for practice and research**

**Practice**: The authors stated that self-expanding stents can be considered in patients who are haemodynamically stable with adequate drainage and when reoperation was not necessary.

**Research**: The authors stated that future studies should report and analyse use of self-expanding stents in the treatment of anastomotic leaks by the type of bariatric procedure performed. Future studies should also explore the optimal role and timing of self-expanding stent placement in the treatment of post-bariatric surgery leaks. New technology should address the high frequency of stent migration.

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