Systematic review of sleeve gastrectomy as staging and primary bariatric procedure
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CRD summary
The authors concluded that laparoscopic sleeve gastrectomy is an effective weight loss procedure that can be performed safely as a first stage or primary procedure. Methodological limitations of this systematic review made the authors' conclusions unlikely to be reliable.

Authors' objectives
To evaluate sleeve gastrectomy as a primary or staging procedure on weight loss, complication rates, postoperative mortality and comorbidity.

Searching
PubMed was searched from 1996 to January 2009 for English-language publications; search terms were reported. References from relevant articles were searched.

Study selection
Studies that evaluated gastrectomy as a primary or staging procedure for weight loss in adult participants were included in the review; prospective and retrospective series were eligible for inclusion. Outcomes had to include weight loss or postoperative complications. Case reports with fewer than five participants, review articles and studies that reported on technique only were not included.

Of the included studies, one reported on the open technique and 35 were laparoscopic. Three of the studies were multicentre and 33 came from single institutions. The authors reported that across all studies, mean age was 42 years, 65% of patients were women and mean preoperative body mass index was 51.2kg/m$^2$ (range 37.2 to 69). Follow-up for weight loss outcomes ranged from three to 60 months across studies.

The authors did not state how many reviewers performed the study selection.

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

Data extraction
Data were extracted according to the indication for sleeve gastrectomy: high risk patients/staged approach or primary procedures.

The authors did not state how many reviewers performed the data extraction.

Methods of synthesis
The authors calculated mean weight loss across all studies. Subgroup data were reported for participants who underwent high-risk/staged procedure compared to participants who underwent a primary procedure.

Results of the review
Thirty-six studies (n=2,570 participants) were included in the review: two randomised controlled trials, one non-randomised controlled trial and 33 uncontrolled case series.

The percentage of excess weight loss ranged from 33% to 85% in 24 studies (n=1,662). Overall mean excess weight loss was reported to be 55.4%. More than 70% of participants had an improvement of remission of type 2 diabetes (10 studies, n=754) (other results were presented in tables).

Major postoperative complications ranged from 0% to 23.8% across studies; an overall mortality rate of 0.19% was
reported. Postoperative complication rate for studies with more than 100 participants ranged from 0% to 15.3%.

**Authors’ conclusions**
Laparoscopic sleeve gastrectomy is an effective weight loss procedure that can be performed safely as a first stage or primary procedure.

**CRD commentary**
This review addressed a clear research question and was supported by appropriate inclusion/exclusion criteria. Only one database was searched and only for English-language publications, which increased potential for publication and language biases. The authors handsearched relevant studies, but some relevant studies may have been missed. The authors did not state how many reviewers were involved in the review process, so reviewer bias could not be ruled out. No assessment of study quality was reported, so the reliability of study results and any conclusions derived from them were unknown. The studies were inappropriately pooled; data from different study types were pooled together and it was not clear whether there was statistical and clinical heterogeneity between the studies. Where possible, pooled data would need to be weighted.

Methodological limitations of this systematic review make the authors' conclusions unlikely to be reliable.

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

**Practice:** This authors stated that laparoscopic sleeve gastrectomy is an effective weight loss procedure that can be performed safely as a first stage or primary procedure.

**Research:** The authors stated that additional studies were needed to assess the effects of laparoscopic sleeve gastrectomy on gut hormone interactions and the effects on glucose metabolism.

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