The weight reduction operation of choice: Mason vs gastric bypass. A comparative study
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Record Status
This is a critical abstract of an economic evaluation that meets the criteria for inclusion on NHS EED. Each abstract contains a brief summary of the methods, the results and conclusions followed by a detailed critical assessment on the reliability of the study and the conclusions drawn.

Health technology
The authors compared the use of Mason versus gastric bypass operations for weight reduction. The Mason procedure was reported to limit the capacity of the stomach, while gastric bypass of the thin colon creates malabsorption in conjunction with reducing the capacity of the stomach.

Type of intervention
Secondary prevention.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised patients with morbid obesity (i.e. a body mass index, BMI, of greater than 40). It included patients with a negative haematologic or pulmonary background, recent heart attack or kidney deficiency.

Setting
The setting was secondary care. The economic study was carried out in Greece.

Dates to which data relate
The dates during which the effectiveness and cost data were collated were not reported. A price year was not reported.

Source of effectiveness data
The effectiveness data were derived from a single study.

Link between effectiveness and cost data
The costing seems to have been carried out prospectively for the same sample of patients as that in the effectiveness study, but this was neither explicitly stated nor completely clear from the report.

Study sample
The authors did not report that power calculations were carried out, either in advance or retrospectively, to estimate the impact of chance on the results. The authors seem to have included patients who were treated by the two procedures of interest in the study setting, perhaps over a set period of time, although this was not explicit in the paper. The sample selected was an accurate reflection of the study population as the average BMI on entry into the study was 45.37 for Mason patients and 51.08 for the bypass patients. Sixty-three patients participated, of which 30 were in the bypass group and 33 were in the Mason group. The mean age of the participants was 34.26 years in the bypass group and 32.21 years in the Mason group. There were no reports of patients being excluded or refusing to participate.
Study design
The study design was not explicitly stated and it was not completely clear from the report. However, the details given were consistent with a cohort study where groups were defined by the patients’ exposure to the treatments of interest. The study was based at a single centre, 251 General Air Force Hospital, Athens. The patients were followed for 6 months and no patients were reported to have been lost to follow-up.

Analysis of effectiveness
The patients seem to have been analysed according to the treatment they received. The primary health outcomes were the BMI 6 months postoperation, the duration of hospitalisation and postoperative complications. The groups were compared at analysis in terms of their gender, blood pressure, hyperlipidaemia, asthma and osteoarthritis, and no statistically significant differences were found. Patients undergoing the Mason technique were found to have a statistically smaller BMI before the operation. The authors did not report any adjustments for this potentially confounding factor.

Effectiveness results
The duration of hospitalisation was 6.3 days (standard deviation, SD=0.91) in the Mason group and 9.3 days (SD=1.85) in the bypass group, (p=0.001).

The difference in BMI before and after the operation was 13.01 (SD=3.42) in the Mason group and 19.55 (SD=3.16) in the bypass group, (p=0.001).

Patients in the Mason group were associated with fewer postoperative complications, (p=0.001), than patients in the bypass group.

Clinical conclusions
The authors concluded that gastric bypass achieves a bigger reduction in BMI after 6 months- follow-up.

Measure of benefits used in the economic analysis
The authors measured quality of life after the operation using the Moorhead-Ardelt questionnaire (see ,Other Publications of Related Interest- below for bibliographic details). The authors reported that this questionnaire considers sentimental, natural, social, labour and sexual behaviour, with answers graded from -1 to +1 with higher scores indicating better quality of life.

Direct costs
Very few details of the cost analysis were reported. The authors reported taking account of hospital expenses, the cost of laboratory examinations both before and after the operation, and the cost of disposables. The source of the unit cost estimates was not explicitly stated, but it was likely to have been the hospital at which the clinical study was carried out. It seems that the quantities have been based on the patients from the clinical study. Discounting was not conducted, nor was it required given the short time horizon. The dates when the costs were collected and a price year were not reported.

Statistical analysis of costs
The costs were treated deterministically.

Indirect Costs
Indirect costs to estimate the wider economic impact of treatment were not estimated.
Currency
Euros (EUR).

Sensitivity analysis
There was no report of a sensitivity analysis being carried out.

Estimated benefits used in the economic analysis
The indicator of quality of life was 1.53 (SD=0.51) in the Mason group and 2.42 (SD=0.52) in the bypass group, (p=0.001).

Cost results
The total cost per patient was EUR 2,596.83 in the Mason group and EUR 4,311.23 in the bypass group. The difference was EUR 1,714.40.

The duration of hospitalisation and the cost of consumables were identified as major cost-drivers.

Synthesis of costs and benefits
The costs and benefits were not combined.

Authors' conclusions
Gastric bypass achieved a bigger reduction in body mass index (BMI) after the 6 months- follow-up, although the Mason procedure was the cheaper alternative.

CRD COMMENTARY - Selection of comparators
The authors compared Mason and gastric bypass operations for weight reduction. Alternative modes of weight reduction, such as exercise, were considered but were reported to be inappropriate for the study population. It was unclear which one of the study alternatives was standard practice in the authors' setting. You should decide if these represent valid comparators in your own setting.

Validity of estimate of measure of effectiveness
The authors reported very few details of the clinical study. Principally, they did not report the design of the study and it was therefore difficult to assess the quality of the results gained. The study seems to have followed a cohort analysis. This design would not help to reduce statistical differences between the study groups, and this is demonstrated in the difference in average BMI values between the Mason and bypass groups. Although this difference was acknowledged, the authors did not attempt to control for this potentially confounding factor and they did not discuss the implications of this with respect to their results. For instance, the bypass patients might have lost more weight on average simply because they had more weight to lose (and actually lost the same percentage body weight), rather than because of bypass being a more effective treatment. The dates when the effectiveness data were collected were not reported, and this makes comparisons across time more difficult.

Validity of estimate of measure of benefit
A summary measure of health benefit was used. However, it was not clear whether the survey used to ascertain patient quality of life estimates had been validated for use in the study population. In addition, it is unclear how the estimate used compares with more widely used measures of quality of life such as the EuroQol.

Validity of estimate of costs
Very few details of the cost analysis were reported. A perspective was not stated, thus it was not possible to ascertain whether all the relevant costs were incorporated. From the costs estimated, the perspective of the health care provider seems to have been adopted. There was no breakdown of the unit costs or quantities and a price year was not reported. In addition, there were no statistical analyses or sensitivity analyses to indicate the robustness of the results. The cost results should therefore be viewed as a first attempt to provide a baseline idea of indicative costs, rather than any attempt to understand the full cost implications of the two treatment alternatives. Generalisation beyond the current study would not be advised.

**Other issues**
The authors drew some comparisons with other studies that had shown similar results in terms of the reduction in body mass and patient satisfaction. The authors did not consider the issue of generalisability but, as mentioned above, extreme caution should be exercised if any attempt to generalise to other settings or populations is used. Nevertheless, the authors addressed all aspects of their study questions and reported their results appropriately. The authors did not discuss limitations of their study. It was clear that English was not the authors’ first language and it is possible that some understanding of the study is lost through ambiguous grammar.

**Implications of the study**
The authors did not specifically recommend one treatment over the other. Instead, they pointed out the benefits of each and recommended close collaboration between the patient and the doctor to ensure the correct choice of treatment. There were no suggestions for further work, but a randomised controlled trial would help to reduce systematic difference between the study groups, such as the different BMI values discussed above.

**Source of funding**
None stated.

**Bibliographic details**

**Other publications of related interest**

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