Laparoscopic appendectomy: comparison with open appendectomy in 720 patients
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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
Laparoscopic appendectomy vs. open appendectomy.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
Patients undergoing appendectomy. The mean age was 29.81 years in the LA group and 32.62 years in the OA group.

Setting
The setting was a 520-bed tertiary teaching hospital, in Salt Lake City, Utah, USA.

Dates to which data relate
Effectiveness and resource data were collected from August 1990 to December 1993. Cost dates were not clearly stated.

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

Link between effectiveness and cost data
Costing was undertaken retrospectively on the same patient sample as that used in the effectiveness analysis.

Study sample
The study sample comprised 720 patient undergoing appendectomy, of which 253 underwent laparoscopic appendectomy (LA) and 467 open appendectomy (OA). Patients were not randomised and no power calculation determined sample size.

Study design
The study was a retrospective case series. No length of follow-up or loss to follow-up were stated.

Analysis of effectiveness
The analysis was based on treatment completers only. The main health outcomes used in the analysis were morbidity rates and post-hospitalisation recovery, the latter assessed using patient surveys. From the responses, comparison was made in the following areas: pain perception on postoperative day 4; number of postoperative days until patients could tolerate light, moderate and vigorous activity; the number of postoperative days until the patient could walk without pain; the number of postoperative days until the patient returned to work; patient perception of wound infection; and patient perception of other infections. The groups were comparable in terms of age and sex.

**Effectiveness results**
The LA patients had significantly lower morbidity rates (5% vs. 14%, p<.02), reported less postoperative pain and were able to return to work sooner.

In the LA and OA group respectively, the results were as follows:

- pain perception on postoperative day 4 (2.8 vs. 3.4, p < 0.003);
- number of postoperative days until patients could tolerate light (5.7 vs. 10, p<0.002), moderate ((12.2 vs. 18.7, p< 0.008) and vigorous (23.5 vs. 38.5, p< 0.013) activity;
- the number of postoperative days until the patient could walk without pain (9 vs. 20, p<0.03);
- the number of postoperative days until the patient returned to work (10.3 vs. 16.5, p< 0.02);
- patient perception of wound infection (0.02 vs. 0.07, p< 0.04);
- and patient perception of other infections (0.03 vs. 0.16, p< 0.25).

**Clinical conclusions**
The use of LA not only simplifies removal of the appendix, but also permits improved visualisation of the appendix and the entire abdominal cavity.

**Measure of benefits used in the economic analysis**
The main health outcomes used in the analysis were morbidity rates and posthospitalisation recovery, the latter assessed using patient surveys. From the responses, comparison was made in the following areas: pain perception on postoperative day 4; number of postoperative days until patients could tolerate light, moderate and vigorous activity; the number of postoperative days until the patient could walk without pain; the number of postoperative days until the patient returned to work; patient perception of wound infection; and patient perception of other infections.

**Direct costs**
Quantities and costs were not reported separately. Direct health service costs were considered, such as overall hospital costs (these were not detailed, but included operating room costs and time spent in the hospital). It seems that costing was based on actual hospital data. It is unclear to which date prices relate.

**Statistical analysis of costs**
P-values were reported.

**Currency**
US dollars ($).

**Sensitivity analysis**
Estimated benefits used in the economic analysis
The LA patients had significantly lower morbidity rates (5% vs. 14%, p<.02), reported less postoperative pain and were able to return to work sooner.

In the LA and OA group respectively, the results were as follows:

- pain perception on postoperative day 4 (2.8 vs. 3.4, p < 0.003);
- number of postoperative days until patients could tolerate light (5.7 vs. 10, p<0.002), moderate ((12.2 vs. 18.7, p<0.008) and vigorous (23.5 vs. 38.5, p< 0.013) activity;
- the number of postoperative days until the patient could walk without pain (9 vs. 20, p<0.03);
- the number of postoperative days until the patient returned to work (10.3 vs. 16.5, p< 0.02);
- patient perception of wound infection (0.02 vs. 0.07, p< 0.04);
- and patient perception of other infections (0.03 vs. 0.16, p< 0.25).

Cost results
The average overall hospital cost of acute non-perforated LA was $3,450 vs. $3,350 for acute non-perforated OA (non-significant); for perforated LA, $5,850 vs. $7,750 (p<.001); and for LA, $4,800 vs. $4,950 for OA (non-significant).

Synthesis of costs and benefits
Laparoscopic appendectomy was the dominant strategy.

Authors' conclusions
LA can significantly decrease morbidity and hospital stay with a comparable hospital cost and results in quicker patient recovery.

CRD COMMENTARY - Selection of comparators
The reason for the choice of the comparator is clear, as open appendectomy is a widely used alternative treatment for appendectomy.

Validity of estimate of measure of benefit
The study was based on results from a retrospective case series. A more reliable assessment of the relative benefits would be obtained from a randomised controlled trial. Data have not been used selectively to prove a particular point.

Validity of estimate of costs
Source quantities were not reported separately from prices. Not enough details of quantities/cost estimation were given. No major cost items were omitted.

Other issues
authors refer to other studies undertaken in the area. The cost data may not be generalisable to other countries.
Implications of the study
Further analysis is needed, in particular to assess the cost effectiveness of LA technique in the case of perforated appendicitis.

Source of funding
None stated.

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