A case controlled study of laparoscopic splenectomy

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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 splenectomy.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
Patients undergoing splenectomy.

Setting
Hospital (community). The economic study was performed in Cleveland, Ohio.

Dates to which data relate
Effectiveness data were collected between 1991 and 1995. Price dates were not stated.

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

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

Study sample
15 patients undergoing laparoscopic splenectomy (LS) from 1993 to 1995 were compared with 15 patients (selected from 20) undergoing open splenectomy (OS) from 1991 to 1995. These patients were matched by age, splenic weight, indications and main comorbidities, by a medical record librarian (independent of the project). Statistical analysis of the matched series showed no differences in terms of age, sex, main diagnosis and comorbid conditions, steroid therapy or splenic weight. In both series, the indications were thrombocytopenic purpura, hemolytic anaemias, hairy cell leukaemia and staging for Hodgkin's disease.

Study design
Retrospective case series. The duration of the follow-up was a minimum of 6 months.
Analysis of effectiveness
Based on treatment completers only. The main health outcomes used in the analysis were mortality, blood loss and complication rates. Other outcomes included time to return to full activity (defined as being able to drive a car or resume other normal daily activities without pain medications).

Effectiveness results
Neither group suffered any losses due to mortality and no switches from laparoscopic splenectomy (LS) to open splenectomy (OS) occurred. Blood loss was no different for either operation. LS appeared to be attended by fewer complications; the only complication in the LS series was atelectasis in a single ninety-year old patient. In the OS series, in addition to several minor complications, two patients required re-admissions (one for respiratory failure and one for pneumonia.) Return to full activity occurred in 12 days (median, range: 5 - 22) after LS, compared with 23 days (median, range: 14 - 46) after OS (p<0.01).

Clinical conclusions
The results suggest that many of the alleged deficiencies of laparoscopic splenectomy are limitations imposed by early experience.

Measure of benefits used in the economic analysis
The measures of benefits used in the economic analysis were mortality, blood loss, complication rates and time to return to full activity.

Direct costs
Direct health services costs were considered: operating room charges, disposable instruments, length of hospital stay, treatment of complications. Price dates were not stated. Discounting was not necessary.

Statistical analysis of costs
Computer-aided descriptive statistical analysis was first undertaken. The t-test was used to detect statistically significant differences where the data were normally distributed. Where the data were not normally distributed, the non-parametric Mann-Whitney rank-sum test was used.

Indirect Costs
Not considered.

Currency
US dollars ($).

Sensitivity analysis
No sensitivity analysis was performed.

Estimated benefits used in the economic analysis
Neither group suffered any losses due to mortality and no switches from laparoscopic splenectomy (LS) to open splenectomy (OS) occurred. Blood loss was no different for either operation. LS appeared to be attended by fewer complications; the only complication in the LS series was atelectasis in a single ninety-year old patient. In the OS series, in addition to several minor complications, two patients required re-admissions (one for respiratory failure and one for pneumonia.) Return to full activity occurred in 12 days (median, range: 5 - 22) after LS, compared. Length of stay was significantly shorter in the LS series (2.3 versus 8.8 days). However operating time in the LS group was 1.7 times as
long (196 minutes versus 116 minutes).

**Cost results**
The longer length of stay coupled with the higher operating room charge for laparoscopic splenectomy ($12,827 versus $4,372), contributed to a greater total cost of LS compared to OS ($18,015 versus $14,524). However if the cost of readmissions for complications are taken into consideration, then the total cost was not significantly different for both LS and OS ($18,015 versus $16,362).

**Synthesis of costs and benefits**
The incremental benefits of laparoscopic splenectomy over open splenectomy were positive, while costs were similar for both procedures.

**Authors' conclusions**
The authors concluded that, except for a few indications not addressed in this study (e.g. trauma, myelofibrosis and polycythemia), laparoscopic splenectomy can be used in lieu of open splenectomy. Although it takes longer to perform, LS requires a shorter hospitalisation, has fewer complications and postoperative normal activity is regained sooner.

**CRD COMMENTARY - Selection of comparators**
The reason for the choice of the comparator (open splenectomy) is clear, as it is a widely used procedure in the authors' settings. You, as a database user, should consider if this applies to your own setting.

**Validity of estimate of measure of benefit**
Data do not appear to have been used selectively to prove a particular point and the choice of health outcomes is justified. Case-controlled studies are particularly prone to selection and recall biases. The use of a person independent of the project was a good measure to reduce potential bias.

**Validity of estimate of costs**
Insufficient details were provided of the source and nature of the costs. Costs were presented for both groups, but a more detailed breakdown would have been helpful. It would have been helpful to report costs by indication.

**Other issues**
The cost data, reflecting, as it does, local hospital charges, may not be generalisable to other settings or countries. Although not attempted by the authors, the time to return to full activity data presents an opportunity for further economic analysis.

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None stated.

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