A comparison of laparoscopic and traditional open splenectomy in childhood

Janu P G, Rogers D A, Lobe T E

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 for the treatment of a variety of hematologic and non-hematologic disorders in childhood.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
Children undergoing splenectomy for the treatment of a variety of hematologic and non-hematologic disorders.

Setting
Secondary care. The economic study was conducted in Memphis, Tennessee, USA.

Dates to which data relate
Effectiveness, resource use and cost data were collected between June 1983 and September 1994. All charges were adjusted to 1994 dollars.

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
61 patients were analysed, age range 1 year to 15 years 4 months. The patients were stratified in 4 groups: traditional open splenectomy with (19) and without (28) concomitant procedures and laparoscopic splenectomy with (4) and without (10) other procedures. Additional procedures included one or more of the following: appendectomy, cholecystectomy, cholangiography, liver biopsy, Meckel's diverticulectomy, wart excision and thyroglossal duct cyst excision. Indications for splenectomy were as follows: hereditary spherocystosis, 19; idiopathic thrombocytopenic purpura, 15; sickle cell disease, 7; thalassemia, 3; idiopathic hypersplenism, 3; preleukemia, 2; idiopathic hemolytic anaemia, 2; sickle cell/Beta-thalassemia, 1; Evan's syndrome, 1; Wiskott-Aldrich syndrome, 1. No power calculations related to the sample size were reported.
Study design
This was a retrospective cohort study. Patients were followed-up until discharge. There seems to have been no loss to follow up.

Analysis of effectiveness
The main health outcomes used in the analysis were: length of hospitalisation, operating time and postoperative complications.

Effectiveness results
The effectiveness results were as follows:

There was a trend towards a 1-day reduction in hospital stay associated with laparoscopic splenectomy, (p<0.02), with an average for open splenectomy of 3.57 days for splenectomy alone and 3.68 days for a combined open procedures, versus 2.70 days for laparoscopic splenectomy alone and 2.25 days for combined procedures.

Operating time was 83% longer for the laparoscopic approach, (p<0.001), with an average time in the operating room of 116 minutes (range: 59 - 223) for open splenectomy alone and 229 minutes (range: 198 - 271) for the laparoscopic procedure.

Two (14%) of the laparoscopic patients had complications - one patient had pneumonia and another required conversion to an open procedure due to poorly controlled haemorrhage.

12 (25%) of the open splenectomy patients had complications as follows: atelectasis, 3; fever, 4; wound infection, 2; pneumonia, 1; laryngospasm, 1; and pancreatitis, 1.

Clinical conclusions
Laparoscopic splenectomy is a safe procedure with no greater risk of postoperative complication than the open procedure and with improvement in the cosmetic result.

Measure of benefits used in the economic analysis
The authors did not provide a summary measure of benefit. As such, a cost-consequences analysis was performed and the benefits are associated with the health outcomes reported above.

Direct costs
Direct hospital charges were used as a proxy for costs. Itemised bills were obtained for all laparoscopic and for 10 of the open procedures. Itemisation included total hospital charge (including the fees described below plus room, medications and lab services), total operating fee (including a miscellaneous equipment fee), and anaesthesia charges. All charges were adjusted to 1994 dollars by a factor of 5% per year, reflective of yearly hospital cost adjustments. This was done by multiplying individual patient charges by the appropriate factor for each category used by the hospital accounting department.

Statistical analysis of costs
Statistical analysis was performed using Fisher's analysis of variance.

Indirect Costs
Indirect costs were not considered.
Currency
US dollars ($).

Sensitivity analysis
No sensitivity analysis was performed.

Estimated benefits used in the economic analysis
As no summary measure of benefit was provided, the reader is referred to the effectiveness results reported above.

Cost results
Total hospital cost averaged $5,221 for open splenectomy cases, with $4,081 for splenectomy alone and $7,501 for combined procedures, versus $7,008 for laparoscopic splenectomy, with $7,233 for laparoscopy alone and $6,445 for laparoscopy with a concomitant procedure, (p<0.1).

Synthesis of costs and benefits
Not applicable due to the cost-consequences approach adopted.

Authors’ conclusions
Laparoscopic splenectomy is a safe but currently more expensive alternative to open splenectomy, primarily because of the use of disposable instruments. Benefits include a shorter hospital stay, no greater risk of postoperative complications, and subjective improvement in the cosmetic result. Disadvantages include increased operating time and cost.

CRD COMMENTARY - Selection of comparators
The reason for the choice of the comparator, open splenectomy, was clear, as both techniques were widely used in the authors’ setting. You, as a database user, should consider if the same applies to your own setting.

Validity of estimate of measure of benefit
The authors did not provide a summary measure of benefits; as such, they conducted a cost-consequences analysis. The estimates of effectiveness are of limited reliability as they were derived from a retrospective analysis of study groups, which were not analysed for their baseline characteristics, comparability and appropriate sample size. A randomised, controlled trial would have been more appropriate for the study question.

Validity of estimate of costs
Inadequate details of the methods of cost estimation were given. The use of charges as a proxy for costs limits the generalisability of the cost results.

Other issues
The analysis showed that the laparoscopic approach was more effective and more expensive. Introducing a single measure of benefit could have made an incremental analysis possible. The authors made relevant comparisons with other studies, but the issue of generalisability of the study results was not addressed.

Implications of the study
An evaluation of larger series and a longer follow up will be needed to determine the significance of the difference in complication rates between the two procedures.
Source of funding
None stated.

Bibliographic details

PubMedID
8632260

Indexing Status
Subject indexing assigned by NLM

MeSH
Adolescent; Analysis of Variance; Child; Child, Preschool; Cost-Benefit Analysis; Hospital Charges; Hospital Costs; Humans; Infant; Laparoscopy /adverse effects /economics; Length of Stay; Postoperative Complications; Retrospective Studies; Splenectomy /adverse effects /economics /methods; Time Factors

AccessionNumber
21996000218

Date bibliographic record published
30/04/2001

Date abstract record published
30/04/2001