Comparison of 49 laparoscopic myomectomies with 49 open myomectomies

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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
Myomectomy using laparoscopic surgery preceded by gonadotropin-releasing hormone (GnRH) using a modified protocol.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
Women of reproductive age with symptomatic uterine leiomyomata.

Setting
Hospital. The economic study was carried out in Chicago, Illinois, USA.

Dates to which data relate
The data were collected from records of procedures performed, for the laparoscopy group between April 1992 to December 1995, and for the open surgery group between December 1983 and April 1995. Data on resources and prices were collected from the same records and costs reflated to April 1995 dollars using the Consumer Price Index.

Source of effectiveness data
Evidence for final outcomes was based on a single study.

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

Study sample
Power calculations did not determine sample size. The length of time over which data were collected differed in the 2 groups and this was not explained. Over the period when both procedures were being used criteria for choosing which procedure to use were not reported. Refusal to participate was not relevant in a chart review. Records of 98 patients were analysed, 49 in each group. The laparoscopic myomectomies were consecutive but 4 patients (8%) were excluded from the open group because uterine size was 20 weeks or larger on preoperative evaluation.

Study design
The study was a non-randomised controlled trial with historical and concurrent (for a certain period of time) controls. The duration of follow-up was not stated although subsequent pregnancies were mentioned. There was no loss to follow-up.

Analysis of effectiveness
Analysis was based on intention to treat. The primary health outcomes were mean blood loss during operation, number of hospital days needed and frequency of post-operative complications. The groups were shown to be comparable in terms of weight, and gravity. The groups were not shown comparable in terms of age, parity, or the number that had had previous pelvic surgery. The open group had larger uteri than those in the intervention group. No adjustment was made for differences.

Effectiveness results
Mean blood loss was 340 (+/- 222) ml in the open group and 110 (+/-133.7) ml in the intervention (p <0.001). Total length of hospital stay was 272 days in the open group (mean 5.6), and 29 days in the laparoscopic group, (mean 0.6), (p <0.001). There were 17 (35%) complications in the open group and 5 (10%) complications in the intervention.

Clinical conclusions
Laparoscopic myomectomy had lower morbidity and fewer complications than open myomectomy.

Measure of benefits used in the economic analysis
No single measure of benefit was produced within the economic evaluation.

Direct costs
The cost boundary was the hospital. Quantities and costs were not analysed separately and only average total costs were presented. An itemised list of hospital costs was obtained for each patient though details were not given. These included operating room, recovery room, room, board, pharmacy, radiology and laboratory fees. Physician fees were excluded. Costs were expressed in April 1995 dollars using the Consumer Price Index from the Bureau of Labor Statistics.

Statistical analysis of costs
Costs were given as mean values with maximum and minimum values. Confidence intervals were not given but statistical significance was considered to be 5%. Mann-Whitney tests for skewed data were used to analyse costs. Local regression (loess) lines were used to analyse time trends. A percentage of the data centred on each point was used to estimate the regression line that would be drawn at that point, 30% of the data were used. Residual analysis was used to identify an outlier, and this was excluded from the regression analysis.

Indirect Costs
Not considered.

Currency
US dollars ($) adjusted to April 1995.

Sensitivity analysis
None was performed.

Estimated benefits used in the economic analysis
Not applicable.

Cost results
The mean total hospital costs expressed in 1995 dollars were $11,179 for open procedures (maximum $30,018, minimum $7,485) and $13,852 (maximum $21,934, minimum $7,980) for laparoscopies which was a significant difference, (p<0.001). However, a significant increasing time trend (p<0.001) was found in costs in the open group which did not exist in the laparoscopic group. The rate of increase was estimated to be $868 per year. Taking this into account the estimated average costs for April 1995 were $14,461 for open and $13,814 for laparoscopic myectomies and the difference between these was not significant, (p=0.65).

Synthesis of costs and benefits
Not applicable.

Authors' conclusions
Laparoscopic myomectomy appears to be a safe and effective procedure for removal of uterine myomas with lower morbidity and fewer complications than open myomectomy. There was no identifiable trend of increasing hospital cost in laparoscopic myomectomy unlike open myomectomy and there was no significant difference in the estimated average cost for 1995 between the 2 procedures.

CRD COMMENTARY - Selection of comparators
The reason for the selection of comparators is clear.

Validity of estimate of measure of benefit
The groups were not comparable in some respects and no adjustments were made for confounding. Also no explanation was given of how patients were allocated to each group when both were concurrent, and this may have hidden further confounding factors which were not reported.

Validity of estimate of costs
There was a difference between groups in mean total costs but the authors only chose to use estimated costs with the time trend removed in their analysis. They did not explain how they arrived at this estimate. The time trend was not explained by the authors. Not enough details of resources and prices were given which makes it difficult to generalise results to another country or setting.

Other issues
An outlying result was excluded from the linear regression analysis but was left in the mean costs and clinical analysis. It is not clear whether this was justified. The length of time over which the comparator data were collected was 4 times as long as that over which the intervention data was collected and this may mask changes in procedures or the skill of the surgeon which were not apparent from the chart review.

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