Should surgical pleurectomy for spontaneous pneumothorax be always thoracoscopic?

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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.

CRD summary
The objective was to examine the clinical and economic impact of video-assisted thoracoscopic surgery (VATS) pleurectomy in comparison with open pleurectomy in patients with primary or secondary spontaneous pneumothorax (SP). The authors concluded that VATS was a cost-effective surgical approach for patients with primary SP, but the open procedure might be preferable for patients with secondary SP. The study had several methodological limitations, which might make the authors' conclusions less robust.

Type of economic evaluation
Cost-effectiveness analysis

Study objective
The objective was to examine the clinical and economic impact of video-assisted thoracoscopic surgery (VATS) pleurectomy in comparison with open pleurectomy in patients with primary or secondary spontaneous pneumothorax (SP).

Interventions
The two surgical procedures were open versus VATS pleurectomy. A detailed description of both procedures was provided.

Location/setting
UK/hospital.

Methods
Analytical approach:
This economic evaluation was based on a single study. The time horizon of the analysis was six to eight weeks after operation. The authors did not explicitly state the perspective.

Effectiveness data:
The clinical data came from a prospective cohort study that enrolled 57 patients from 2004 to 2006 at a single hospital. There were 26 patients in the VATS group and 31 in the open group. VATS was mainly used for primary SP (21 VATS and 8 open), while open pleurectomy was mainly used for secondary SP (5 VATS and 23 open). Patients were seen as out-patients at the hospital six to eight weeks after their operation. A logistic regression analysis was undertaken to examine the effects of the surgical procedure on in-patient morbidity while adjusting for differences in patient characteristics. The primary clinical endpoint was the recurrence of pneumothorax.

Monetary benefit and utility valuations:
Not relevant.

Measure of benefit:
No summary benefit measure was derived. The key clinical outcomes were duration of operation, hospital stay, recurrences of pneumothorax, and time until return to work.

Cost data:
The economic analysis considered the hospital costs associated with the surgical procedure in the operating theatre, excluding personnel. A breakdown of cost items was not provided. The resource use referred to the actual consumption
of resources in the sample of patients in the cohort study. The price year was not reported and all costs were in UK pounds sterling (£).

Analysis of uncertainty:
Not performed.

Results
Total costs were £1,770 in the VATS group and £3,226 in the open group.

The median operating time was 54 minutes (95% confidence interval, CI: 30 to 90) for VATS and 75 minutes (95% CI: 50 to 150) for open pleurectomy (p=0.005). The hospital stay was not significantly different between groups (8 days for VATS and 8.3 days for open). The weeks until to return to work in the subgroup of patients with primary SP were 6 for VATS and 10 for open (p=0.007), and there was no difference for patients with secondary SP. One elderly patient with secondary SP in the open group died due to respiratory failure after the operation. During follow-up, recurrent pneumothorax developed in three patients in the VATS group and none in the open group.

Authors’ conclusions
The authors concluded that VATS was a cost-effective surgical approach for patients with primary SP, but the open strategy might be preferable for patients with secondary SP.

CRD commentary
Interventions:
The criterion for the selection of the two strategies appears to have been valid, in that they represented the two available surgical procedures for patients with SP.

Effectiveness/benefits:
The clinical evidence came from a prospective cohort study, the main drawback of which was the lack of random allocation of patients to treatment groups. In effect, the choice of the surgical procedure was based on patient and surgeon preferences. This may have introduced selection bias, which strongly affects the validity of the clinical comparison. The length of follow-up appears to have been adequate to capture the morbidity or mortality for the procedure. The evidence came from a single medical institution, which may not have represented the procedures carried out in other medical centres. The size of the patient sample was not justified on the basis of statistical calculation and some outcomes referred to smaller subgroups of patients, which further limited their power to detect statistically significant differences. Some differences in clinical endpoints were apparent and reached statistical significance. No statistical analysis was carried out to demonstrate the baseline comparability of the study groups. These issues should be kept in mind when assessing the validity of the clinical evaluation.

Costs:
The economic viewpoint was not explicitly stated, but the types of costs and their source appear to indicate the perspective of the hospital. The costs appear to have been derived from the hospital accounting system although this was not explicitly stated. They were not broken down into single items and the only statement was that staff costs were excluded. Little information on the economic analysis was provided, with no unit costs, quantities of resources used, and price year reported. No statistical analyses on the costs were carried out.

Analysis and results:
The costs and benefits were not synthesised, given that a cost-consequences framework appears to have been used. The clinical and economic findings were clearly presented. The issues of uncertainty and generalisability were not addressed.

Concluding remarks:
The study had several methodological limitations, which could make the authors’ conclusions less robust.

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