**In-hospital clinical and economic consequences of pulmonary wedge resections for cancer using video-assisted thoracoscopic techniques vs traditional open resections: a retrospective database analysis**

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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**
This study examined the clinical and economic impact of video-assisted thoracoscopic surgery, compared with conventional open thoracotomy, for wedge resection in lung cancer. The authors concluded that the data showed clear short-term clinical and economic advantages with video-assisted surgery. Despite the retrospective analysis, the data were from a large database and valid statistical tests were used to consider the variability in the data and the impact of confounding factors. The authors' conclusions appear to be robust.

**Type of economic evaluation**
Cost-effectiveness analysis

**Study objective**
This study examined the clinical and economic impact of video-assisted thoracoscopic surgery, compared with conventional open thoracotomy, for wedge resection in lung cancer.

**Interventions**
Video-assisted thoracoscopic surgery was compared with conventional open thoracotomy to diagnose or treat lung cancer.

**Location/setting**
USA/tertiary care.

**Methods**
Analytical approach:
The economic evaluation was based on a retrospective analysis of a large, nationally representative database of hospital claims data. A short-term horizon was considered (approximately 30 days after surgery). The perspective was not explicitly stated.

Effectiveness data:
All the data were from the Premier Perspective database, which contained clinical resource use information on patients receiving care in more than 600 US hospitals and out-patient surgery centres. It covered the histories of more than 25 million in-patients and more than 175 million out-patient visits. The analysis included thoracoscopic surgeries that were performed between 2007 and 2008. There were 8,228 potentially eligible procedures and 2,051 of these were wedge resections performed by a surgeon, with 999 (mean age 66.88 years, SD 11.46; proportion of women 0.52) receiving open thoracotomy and 1,052 (mean age 65.98 years, SD 11.76; proportion of women 0.53) receiving video-assisted thoracoscopic surgery. The two groups were well balanced at baseline. Statistical analyses were carried out on the differences between the treatment groups, accounting for possible confounding factors. The primary endpoints were the complication rate (during and after operation) and the length of stay.

Monetary benefit and utility valuations:
Not considered.

Measure of benefit:
No summary benefit measure was used. The complication rates and length of stay were the main endpoints for the analysis.

Cost data:
The economic analysis included the hospital costs per patient (both fixed and variable). This excluded the initial capital cost and amortisation of non-disposable equipment for the video-assisted surgery. All the costs and quantities of resources were from the Premier Perspective database. The costs were in US $ and all costs referred to 2007 or 2008 prices.

Analysis of uncertainty:
Not considered.

Results
The multivariate analysis showed that the operative technique (open or video-assisted) was an independent determinant of cost, operating room time, and length of stay.

The adjusted mean hospital costs were $17,377 (SD 5,185) for open thoracotomy and $14,795 (SD 4,415) for video-assisted surgery. The length of stay was 6.34 days (SD 2.31) for open surgery and 4.44 days (SD 1.62) for video-assisted surgery. Both these differences were statistically significant.

The odds ratio for all postoperative adverse events with open thoracotomy, compared with video-assisted surgery, was 1.57 (95% CI 1.29 to 1.91) and this was statistically significant. Arrhythmias, haemorrhages, and pulmonary complications were significantly more common with open thoracotomy.

Both the economic and the clinical outcomes favoured video-assisted thoracoscopic surgery.

Authors' conclusions
The authors concluded that the data showed clear short-term clinical and economic advantages with video-assisted thoracoscopic surgery for lung cancer, over open thoracotomy.

CRD commentary
Interventions:
The selection of the comparators was appropriate as the authors compared the new surgical technique against the usual method for diagnosing or treating lung cancer in patients who required wedge resection.

Effectiveness/benefits:
The clinical analysis had some drawbacks due to the study design. Administrative databases are generally considered to be weak sources of evidence, as they do not allow a clear analysis of the relationship between the intervention and the outcome, particularly as they are analysed retrospectively. There were a large number of patients, from multiple institutions, and appropriate statistical tests were used to account for confounding factors. The authors showed that the two groups were initially comparable in their clinical and demographic factors, except that there were significantly more primary cancers and a higher severity score for the open thoracotomy group. The outcome measures were specific to the interventions and will not allow comparisons with the benefits of other health technologies.

Costs:
The authors did not explicitly state the perspective, but the cost categories and their sources reflected the hospital viewpoint. The resource use and unit costs were from the large database of several US institutions, which should have been representative of the US setting. Appropriate statistical analyses were conducted to account for differences in costs between the two groups due to differences in the patients' characteristics. The price year was not explicitly reported, but all costs were from 2007 or 2008.

Analysis and results:
The results were extensively presented. The costs and benefits of the two strategies were not combined in a cost-effectiveness ratio. The uncertainty was not investigated in sensitivity analyses, but statistical tests were used to assess the variability of the data. The authors acknowledged that the main issue with their analysis was the potential for
selection bias in the study design. These findings were specific to the USA and might be difficult to transfer to other countries.

Concluding remarks:
Despite the retrospective nature of the analysis, the data were from a large database and valid statistical tests were used to consider the variability in the data and the impact of confounding factors. The authors’ conclusions appear to be robust.

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