Early evacuation of traumatic retained haemothoraces using thoracoscopy: a prospective, randomized trial

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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
Early evacuation of traumatic retained haemothoraces using video-assisted thoracoscopy (VATS).

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
Patients with retained haemothoraces after thoracic trauma and a chest roentgenogram showing a retained hemothorax within 72 hours of the initial thoracostomy tube placement.

Setting
Hospital. The economic study was conducted at Parkland Memorial Hospital, Dallas, Texas, USA.

Dates to which data relate
Effectiveness data were collected between April 1992 and June 1996. Cost data related to the same period.

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
39 patients qualified for the study. There were 35 men and 4 women, (mean age 29.3 years, range: 15 - 57 years). The mechanism of injury was penetrating in 33 patients and blunt in 6 patients. Patients with minimal costophrenic angle blunting were excluded. Patients were randomised to one of the two groups based on initial management strategy: group 1, placement of a second tube thoracostomy (n=24) and group 2, VATS (n=15). Group 1 patients in whom additional tube placement failed (n=10) were subsequently randomised to either VATS (n=5) or thoracotomy (n=5).

Study design
The study was a prospective randomised controlled trial carried out in a single centre. There was a six month follow-up
period.

**Analysis of effectiveness**
Groups were compared based on intention to treat (patients who crossed over to other therapies remained in their initial category). A secondary analysis of groups which failed the initial therapy was also conducted. The main health outcomes used in the analysis were mortality and number of complications. Groups were shown not to be comparable in terms of demographic characteristics.

**Effectiveness results**
In the entire series there was no mortality. Atelectasis developed in 5 patients (all patients had undergone VATS; 2 from group 2 and 3 from group 1 who required this additional procedure). After final removal of tube thoracostomy, three recurrent pneumothoraces and two recurrent haemothoraces developed, all in group 1 and all requiring further intervention. At 6-month follow-up, no epyema or fibrothorax was identified in any patient.

**Clinical conclusions**
The goals of acute intervention in cases of retained haemothoraces include rapid removal of residual clot without having to wait for haematoma liquefaction, identification of the source or persistence of bleeding, and detection and treatment of other injuries in the thorax. VATS is able to achieve all these objectives.

**Measure of benefits used in the economic analysis**
No single measure of benefits was produced.

**Direct costs**
Hospital costs were considered and included all preoperative, intraoperative and post-operative expenses but did not include professional costs. Costs/quantities were not reported separately. Quantities of resources were measured for 33 patients (21 in group 1 and 12 in group 2). Price data referred to the period of the trial.

**Statistical analysis of costs**
Statistical analysis was performed using the Student's t test when two groups were compared, and using analysis of variance when more than two groups were included. Differences were considered significant at p <0.05.

**Currency**
US dollars ($).

**Sensitivity analysis**
No sensitivity analysis was performed.

**Estimated benefits used in the economic analysis**
Not applicable.

**Cost results**
Patients in group 2 had shorter duration of tube drainage, shorter hospital stay after the procedure and shorter total hospital stay. Hospital costs were less in this group: $7,689 (+/- 3,278) versus $13,273 (+/- 8,158), (p <0.02).
Synthesis of costs and benefits
Not applicable.

Authors' conclusions
The authors concluded that, in many patients treated only with additional tube drainage (group 1), this therapy failed, necessitating further intervention. Intent to treat with early VATS for retained haemothoraces decreased the duration of tube drainage, the length of hospital stay and hospital cost. Early intervention with VATS might be a more efficient and economical strategy for managing retained haemothoraces after trauma.

CRD COMMENTARY - Selection of comparators
The reason for the selection of comparators (VATS versus secondary tube thoracostomy) is clear, as both are widely used in the authors' setting. You, as a database user, should consider if this applies to your own setting.

Validity of estimate of measure of benefit
The small sample size may have affected the internal validity of the study.

Validity of estimate of costs
Insufficient details were provided of the source and nature of the costs included. Professional costs were not included in the analysis, and it is possible, therefore, that the cost differences favouring VATS may be overstated.

Other issues
The authors acknowledged that the study was limited by the size of the study sample. Also, randomisation did not include a blocking factor to assure equal group sizes and, as a result, group sizes were different.

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