Is adhesive paper-tape closure of video assisted thoracoscopic port-sites safe?  
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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
The study compared two different technologies used for port-site suturing in video-assisted thoracoscopic surgery (VATS). These were traditional dissolvable sutures (monocryl 3/0) (group A) and the use of adhesive paper-tape (6 mm x 75 mm, steri-strip, 3M HealthCare, St. Paul, USA) (group B).

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
The authors reported that the study population comprised patients undergoing VATS who were recruited preoperatively. No exclusion criteria were reported.

Setting
The setting was inpatient care at a university hospital. The economic study was carried out in Cardiff, UK.

Dates to which data relate
No dates were reported for either the effectiveness or cost data.

Link between effectiveness and cost data
The costing appears to have been undertaken prospectively on the same sample of patients as that used in the effectiveness study.

Study sample
Though the sample size was determined in the planning phase of the study, no details about the primary objective or magnitude of the effect that the study was powered to detect were given. The method used to select the sample was not described. There were no data on patients who refused to participate or were excluded. The trial included 30 patients in each of the two groups.

Study design
This was a single-centre, randomised, controlled trial. No detail about the randomisation process was reported. It was not feasible to blind the intervention. The only blind outcome assessment appears to have been the presence of pneumothorax. Follow-up was 6 weeks.
Analysis of effectiveness
No primary outcome was specified. The clinical outcomes evaluated were the incidence of pneumothorax, wound healing and patient comfort (assessed using a visual analogue score). Wounds were assessed through the ASEPSIS score (Additional treatment, Serous discharge, Erythema, Purulent exudates, Separation of deep tissues, Isolation of bacteria, Stay as inpatient prolonged over 14 days). No loss to follow-up was reported, and there were no reported crossovers. The specific type of analysis (i.e. intention to treat) was not reported, but it seems likely that the intention to treat and treatment completers only approaches would both have produced the same results. The groups were broadly comparable at baseline.

Effectiveness results
All patients had an intercostal chest drain inserted post-procedure. After chest drain removal, no clinically significant pneumothoraces occurred in either group. However, prior to hospital discharge, 20% and 34% of patients in groups A and B, respectively, had a small, clinically non significant pneumothorax (size < 10%) on their chest radiograph, (p=0.21).

There was no wound dehiscence or infection in either group.

Pain scores at day 1 and 7 were similar between the two groups.

Clinical conclusions
Both techniques showed similar clinical results. There were no clinically significant pneumothoraces in either group. There were also no significant differences between the two groups in terms of immediate postoperative pain scores, wound cosmesis or wound complications.

Measure of benefits used in the economic analysis
The authors did not derive a summary measure of benefits and the costs and effects were left disaggregated. Therefore, in effect, this was a cost-consequences analysis.

Direct costs
The only cost included was that of wound closure per patient. Though this appears to have included the wound closure time (which was explicitly measured in the study), it was not clear whether other costs such as those of the suture materials were also included. Sources were also not reported clearly. The cost year was not reported. Discounting was not relevant given the short-term horizon of the study.

Statistical analysis of costs
Statistical analyses were conducted to compare wound closure time and cost per patient, and the results reported. Nevertheless, the statistical tests used were not described.

Indirect Costs
Productivity costs were not included.

Currency
US dollars ($).

Sensitivity analysis
Further analysis of uncertainty was not reported.
Estimated benefits used in the economic analysis
See the 'Effectiveness Results' section.

Cost results
It was quicker to close the wound with adhesive paper-tape. The mean time of closure per unit length of wound was 9.3 (standard deviation, SD=5.9) seconds/mm for group A versus 2.2 (SD=2.8) seconds/mm for group B, (p<0.01).

The cost of wound closure (per patient) was $4.0 for sutures (group A) versus $0.8 for adhesive paper-tape (group B), (p<0.01).

No other cost results were reported.

Synthesis of costs and benefits
The costs and benefits were not combined.

Authors' conclusions
The study confirmed that adhesive paper-tape is a safe and cost-effective technique even in thoracoscopic surgery. It prevented the development of clinically significant pneumothoraces, there was satisfactory wound healing, and it avoided the risk of needle-stick injuries.

CRD COMMENTARY - Selection of comparators
The authors stated that, traditionally, port-sites have been closed with dissolvable sutures. Hence, this was the comparator chosen for the new technique studied (adhesive paper-type). This study does not appear to have considered the relative effects of other types of port-site closing that could be used in other settings.

Validity of estimate of measure of effectiveness
Though the analysis was based on a randomised controlled trial, the study has some important limitations. It was not clear if the study was powered to detect clinically significant results, the randomisation process was not described in any detail, and the analytical strategy was not reported. All of these factors represent limitations to the internal validity of the study results.

Validity of estimate of measure of benefit
In effect, this was a cost-consequences analysis. See comments in the 'Validity of estimate of measure of effectiveness' field (above).

Validity of estimate of costs
There were few details of the costing methodology. In particular, the study perspective was not reported, and neither were cost sources or dates and important cost categories. The only costs considered were those of the suture techniques, and it was unclear how these were calculated. Statistical analyses were performed but the methods used were not described. The price year was not reported, which will hinder any future inflation exercises. Discounting was not relevant, as the costs were incurred during a short time, and was therefore not performed.

Other issues
The authors made appropriate comparisons of their findings with those from other studies. However, generalisability to other settings was not addressed. The authors did not report any further limitations of their study, thus the reader is referred to the 'Validity of estimate of measure of effectiveness' and 'Validity of estimate of costs' fields (above) for additional information on study limitations. In addition, the authors appear to have presented and described their study selectively, and there was a lack of clarity and transparency around the study methodology.

Implications of the study
This small study showed that clinical outcomes were similar between the traditional dissolvable sutures and adhesive-
paper tape, the latter also having lower costs. Being a negative study in terms of difference in effects, it is not clear if the study was adequately powered to confirm clinical equivalence. If further studies confirm these findings, adhesive paper-tape could become the method of choice in VATS.

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