Octylcyanoacrylate skin closure in laparoscopy

Sebesta M J, Bishoff J T

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
Patients undergoing laparoscopic surgery had their trocar sites closed with octylcyanoacrylate (Dermabond, Ethicon), a long-chain cyanoacrylate tissue adhesive. No dressing was applied to the wounds and no adhesive should have been allowed to get between the wound edges. A comparator group of patients had their trocar sites closed using subcuticular suture using either 4-0 Vicryl or 4-0 Monocryl. Each wound was then dressed with Steri-strips, a 2x2-cm gauze pad, and tape or a Tegaderm dressing. Wounds in both groups that did not closely approximate received interrupted subcutaneous sutures.

Type of intervention
Treatment.

Economic study type
Cost-effectiveness analysis.

Study population
The study population comprised patients undergoing laparoscopic surgery and needing trocar sites to be closed. Wounds less than or equal to 1 cm were evaluated.

Setting
The setting was secondary care. The economic study was carried out in Texas, USA.

Dates to which data relate
The dates to which the effectiveness and resource evidence related were not given. The price year was not reported.

Source of effectiveness data
The effectiveness data were derived from a single study.

Link between effectiveness and cost data
The same patients provided both the effectiveness evidence and the resource evidence. It was unclear whether the costing was carried out prospectively or retrospectively.

Study sample
No power calculations were reported. The sample was not selected, as all the patients of one surgeon were included in the study. There were 30 patients in the octylcyanoacrylate group and 29 patients in the subcuticular suture group.
Study design
This was a single-centre, randomised controlled trial. The patients were followed up 2 weeks after surgery.

Analysis of effectiveness
The basis of the analysis was intention to treat. The primary health outcomes used to assess the methods of skin closure were:

- skin closure time,
- evidence of infection,
- dehiscence,
- seroma, and
- general cosmetic appearance of the wound.

All complications were recorded. Information on the comparability of the groups at baseline was not given, although the height-to-weight ratio for each patient was given.

Effectiveness results
The mean closure time was 3 minutes 42 seconds (range: 2.41 - 5.00; standard deviation, SD=1.13 minutes) in the octylcyanoacrylate closure group and 14 minutes 5 seconds (range: 8.27 - 24.43; SD=6.00 minutes) in the suture closure group.

Five patients in the octylcyanoacrylate group had wound complications in nine incisions, and 2 patients experienced skin separation in five incisions. One patient had a minor wound infection at one incision site and 2 patients experienced small seromas at three incision sites.

In the suture closure group, 2 patients had small seromas that were treated by secondary intention after skin opening and drainage.

Clinical conclusions
For laparoscopic trocar sites of less than 1 cm where the wound was not deep, the authors recommended octylcyanoacrylate because it resulted in a quicker closure time for the wound.

Measure of benefits used in the economic analysis
No summary measure of benefit was used as the authors carried out a cost-consequences analysis.

Direct costs
No discounting was carried out since the costs were incurred during less than 2 years. The quantities and the costs were not analysed separately, although some prices were given. More specifically, the cost per minute of the operating room, the cost of 4-0 Vicryl and the cost of 4-0 Monocryl. The costs were estimated using actual data from the hospital. It was unclear which costs were included in the estimate of the total costs, as they were not itemised. No price year was given.

Statistical analysis of costs
No statistical analysis of the costs was carried out.

Indirect Costs
No indirect costs were calculated.

**Currency**

US dollars ($).

**Sensitivity analysis**

No sensitivity analysis was carried out.

**Estimated benefits used in the economic analysis**

See the 'Effectiveness Results' section.

**Cost results**

The mean cost per patient was $193.32 (range: 130 - 365; SD=49.40) in the octylcyanoacrylate group and $497 (range: 295 - 835; SD=139.70) in the suture closure group. It was unclear whether the costs of adverse effects were included, or whether all hospital costs incurred during the 2 weeks after surgery were also included.

**Synthesis of costs and benefits**

The costs and benefits were not combined as the study was, in effect, a cost-consequences analysis.

**Authors' conclusions**

For patients with laparoscopic trocar site wounds of less than 1 cm in length, their wounds heal faster when the skin is closed using octylcyanoacrylate than when using subcuticular sutures, and the costs are lower.

**CRD COMMENTARY - Selection of comparators**

The choice of the comparator (subcuticular skin sutures) was justified by it having been standard practice in the past. You should decide whether it is a widely used practice in your own setting.

**Validity of estimate of measure of effectiveness**

The effectiveness data were derived from a single study. The study design, a randomised controlled trial, was appropriate for the study question. Since there was no sample selection, the study sample is likely to be representative of the study population. However, the patient groups were not shown to be comparable at baseline. The analysis of effectiveness was not complete as the authors did not discuss the higher complication rate in the octylcyanoacrylate group, although they did state that the wound complication rate in this group had improved over time. There were no other sources of effectiveness data.

**Validity of estimate of measure of benefit**

The authors did not derive a summary measure of health benefit. The analysis was one of cost-consequences. The health benefits are therefore those associated with the effectiveness outcomes, and the reader is referred to the above comments on the validity of the estimate of effectiveness.

**Validity of estimate of costs**

It was unclear whether all the hospital costs were included, as the costs were not broken down into all their components. Therefore, it is not clear whether any omitted costs would affect the authors' conclusions. It was also unclear whether the costs of complications were included. The costs were not reported separately from the quantities, although some unit costs were given. The resource use quantities were taken from a single study. No statistical or sensitivity analyses...
on the costs were undertaken. The prices were taken from the authors’ setting. It was unclear whether charges were used to proxy prices and no price year was given. These factors tend to limit the internal validity and generalisability of the cost results.

**Other issues**
The authors made appropriate comparisons of their results with those from other studies. However, they did not address the issue of generalisability to other settings. The authors did not present their results selectively, but their conclusions did not account for the complication rate in the octylcyanoacrylate group and deficiencies in the cost data.

**Implications of the study**
The authors concluded that the use of octylcyanoacrylate for laparoscopic trocar sites could be recommended, because it cost less and resulted in wounds healing more quickly. The technique is easy to learn and not demanding to administer.

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None stated.

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