

Surgical techniques in laparoscopic cholecystectomy: effect on postoperative pain

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Aims: Laparoscopic cholecystectomy has become the gold standard for the treatment of symptomatic gallstones, and different operative techniques have been developed to improve the safety and effectiveness of this procedure. We examined the evidence for the effects of different operative techniques on postoperative pain after laparoscopic cholecystectomy.

Methods: Systematic literature review (1966–June 2003) using the Cochrane protocol; randomised trials of operative techniques in laparoscopic cholecystectomy that reported pain scores (VAS 1–10 cm). Reduction in pain scores/analgesia was reported when $p < 0.05$. Where possible, data were grouped and weighted mean differences (WMD) calculated.

Results: Total number of studies (n)=24. Low-pressure (7.5–9 mmHg) *versus* conventional-pressure (12–15 mmHg) CO₂ pneumoperitoneum, n=3: reduction of pain scores and analgesic use (all 3 studies).

Warmed *versus* conventional CO₂ pneumoperitoneum, n=3: no reduction of pain scores (WMD -0.66 [-1.64, 0.32], $p=0.19$); or analgesic use (2 of 3 studies).

Gasless technique *versus* CO₂ pneumoperitoneum, n=2: no reduction of pain scores or analgesic use (both studies).

Removal of CO₂ by suction *versus* no suction, n=2: reduction of pain scores in 1 study and reduction of analgesic use in the other.

Microlaparoscopic *versus* conventional laparoscopic cholecystectomy, n=6: reduction of pain scores in 3 of 6 studies; no reduction of analgesic use (5 of 5 studies).

Radially expanding trocars *versus* conventional trocars, n=2: reduction of epigastric pain in 1 of 2 studies.

Single studies showed a reduction of pain scores and/or analgesic use for: N₂O *versus* CO₂ pneumoperitoneum, humidified CO₂ insufflation *versus* standard CO₂ insufflation, and trans-umbilical *versus* standard laparoscopic cholecystectomy; but results were non-significant for helium *versus* CO₂ insufflation, and for day-procedure *versus* overnight stay surgery

Conclusion(s): Low-pressure CO₂ pneumoperitoneum (<10 mmHg) provides analgesic benefits, as does active removal of CO₂. Reducing the size of portal incisions also reduces pain, but the effects may be small and the cost and complexity of this technique should also be considered. No analgesic benefit was found for warming the insufflation gas or for a gasless approach. Further data are required to make conclusions about the analgesic benefit of N₂O, helium, humidification, trans-umbilical technique, early discharge and radially expanding trocars.