ONCOLOGIC OUTCOMES OF LAPAROSCOPIC AND OPEN COLORECTAL CANCER SURGERY
META-ANALYSIS AND CORRELATION WITH EXPERT OPINION

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BACKGROUND
• Laparoscopic surgery is increasingly used to treat colorectal cancer
• Survival and oncologic outcomes are most important in evaluating this technology
• Numerous RCTs have been conducted, but no good review of survival data
• Unclear whether surgeons adoption of this technology has relied upon survival evidence

STUDY CRITERIA
• Systematic review and meta-analysis
  Population: Patients with colorectal cancer
  Intervention: Laparoscopic surgery
  Control: Open surgery (laparotomy)
  Primary Outcome: Survival
  Secondary Outcomes: Operative, postoperative, long-term, QoL
  Study Types: RCTs, observational, reviews, guidelines, chapters

SEARCH STRATEGY
• Electronic search strategy devised with librarian, high sensitivity
• 6 major databases, 13 minor databases
• Snowball technique: manual reference list review and forward citation linkage since 2008
• 9 major textbooks (all editions since 1991)
• No language limitation

DATA MANAGEMENT
• Articles screened and reviewed for inclusion
• Included articles were abstracted into forms
• Non-English papers translated with Google Translate
• RCT data was synthesized and pooled where appropriate using standard methods
• RevMan 5, random effect models

META-ANALYSIS OF SURVIVAL DATA
• Time-to-event (survival) data difficult to pool, as must use hazard ratio (rarely available)
• Continuous or dichotomous outcomes not not reliable, difficult to interpret
• Used published methods to get estimates of ln(HR) and var(ln(HR)) from individual papers
• Pooled ln(HR) using inverse variance method and random effect model
ANALYSIS OF EXPERT OPINIONS

- Review articles as a measure of expert opinion
- Included article if addressed laparoscopy for colorectal cancer OR if addressed surgical treatment of colorectal cancer
- Used Likert scale to derive the author’s opinion regarding value of laparoscopy (in addressing the primary outcome)

<table>
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<tr>
<th>Likert Scale</th>
<th>1</th>
<th>2</th>
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<th>4</th>
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| Rated as...  | Not | Inferior to | Inadequate | Equivocal | Not adequate | Equivalent | Inferior to
| standard of care | open | open | open | open | standard of care | open | open |

STUDY FLOW CHART

- 5,799 articles identified in search
- 4,789 articles excluded after abstract review
- 919 articles reviewed in full text
- 671 articles included in review
- 42 articles on 25 RCTs
- 413 review articles

STUDY CHARACTERISTICS

- 25 trials from 15 countries
- Europe 48%, Asia 28%, US 16%, others 8%
- 6 multicenter trials (smallest 3, largest 48)
- Largest study 1,082 patients (COLOR trial), smallest study 28 patients (Brazil)

INCLUDED PATIENTS

- 6,488 patients with colorectal cancer
- 4,279 patients with colon CA (66%), but none with transverse
- 2,209 patients with rectal CA (34%), but only 633 (9.8%) with low anterior resections

OVERALL SURVIVAL

- Only 7 trials provided sufficient data for pooling of HR

Colon only: HR 0.98 [0.83, 1.15], not heterogeneous
Rectum only: HR 0.70 [0.49, 1.00], p<0.05, not heterogeneous

LYMPH NODE RETRIEVAL

- Colon only: mean difference -1.31 [-3.82, 1.20], significant heterogeneity
- Rectum only: mean difference 0.08 [-1.69, 1.84], less heterogeneous
CONCLUSIONS

• Laparoscopy for colon cancer appears equivalent to open surgery in terms of major oncologic outcomes – it can be utilized in general practice

• There is currently insufficient RCT data to support the routine use of laparoscopy for rectal cancer – further trials are required

• Expert opinion in the literature is supportive of laparoscopy for colon cancer, particularly since 2003

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