Complete mesocolic excision: is more better?

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14/02/2015
Overview

- **Complete mesocolic excision (CME)**
- Nodal spread in Colon Cancer (CC)
- Nodal count and survival in CC
- Local recurrence in CC
- CME: current clinical evidence
- Conclusions
Total mesorectal excision (TME)

Locally recurrent disease
TME

Lin M World J Surg 2009
CME for CC

1. Removal embryological mesocolon
2. Ligation close to main vascular trunk

Maximize lymph node harvest

Hohenberger Colorectal Disease 2009
• High ligation -> ↑ risk of bleeding
• Laparoscopic
• Damage to sympathetic autonomic nerves
CME

Local recurrence rate
Survival

?
Observed survival rates for 28,491 cases with adenocarcinoma of the colon

<table>
<thead>
<tr>
<th>Years from diagnosis</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>100.0</td>
<td>91.4</td>
<td>87.0</td>
<td>82.6</td>
<td>78.2</td>
<td>74.0</td>
</tr>
<tr>
<td>IIA</td>
<td>100.0</td>
<td>89.9</td>
<td>83.4</td>
<td>77.8</td>
<td>72.0</td>
<td>66.5</td>
</tr>
<tr>
<td>IIB</td>
<td>100.0</td>
<td>85.4</td>
<td>77.8</td>
<td>69.1</td>
<td>62.9</td>
<td>58.6</td>
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<td>IIC</td>
<td>100.0</td>
<td>66.0</td>
<td>52.5</td>
<td>45.3</td>
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<td>IIIA</td>
<td>100.0</td>
<td>98.3</td>
<td>88.0</td>
<td>83.6</td>
<td>79.1</td>
<td>73.1</td>
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<tr>
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<td>100.0</td>
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<td>70.8</td>
<td>59.3</td>
<td>51.7</td>
<td>46.3</td>
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<td>IIIC</td>
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<td>71.9</td>
<td>50.3</td>
<td>39.0</td>
<td>32.9</td>
<td>28.0</td>
</tr>
<tr>
<td>IV</td>
<td>100.0</td>
<td>39.9</td>
<td>19.7</td>
<td>11.3</td>
<td>7.6</td>
<td>5.7</td>
</tr>
</tbody>
</table>

Data from the SEER 1973-2005 Public Use File diagnosed in years 1998-2000. Stage I includes 7417; Stage IIA, 9956; Stage IIB, 997; Stage IIC, 725; Stage IIIA, 868; Stage IIIB, 1492; Stage III, 2000; and Stage IV, 5036.

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Graphic 81414 Version 9.0

91.4%

70.2%
CME

1. Mobilization of intact mesentery
   "good surgical practice"
2. Proximal vessel ligation
Overview

- Complete mesocolic excision (CME)
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- Conclusions
Biology of nodal spread in CC

Linear progression model

1st Lymph node metastasis

“Barriers”

Distant metastasis

Parallel progression model

Cancer is systemic disease from its onset

Therapeutic effect of lymphadenectomy

Halsted Ann Surg 1894

Fisher Cancer Res 2008
Evidence for the parallel progression model in CC
### Circulating tumor cells

<table>
<thead>
<tr>
<th>Authors</th>
<th>Detection method</th>
<th>Marker(s)</th>
<th>No. of patients</th>
<th>Colon/rectum</th>
<th>UCSS stage</th>
<th>Sampling site</th>
<th>Sampling time</th>
<th>CTC detection rate (%)</th>
<th>Outcome measure(s)</th>
<th>Prognostic impact of CTC detection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardingham et al.</td>
<td>RT-PCR</td>
<td>CK19, CK20, MUC2</td>
<td>94</td>
<td>NR</td>
<td>I-III</td>
<td>PB</td>
<td>Pre-op</td>
<td>20</td>
<td>DFS</td>
<td>Shorter, NE</td>
</tr>
<tr>
<td>Bessa et al.</td>
<td>RT-PCR</td>
<td>CEA</td>
<td>68</td>
<td>NR</td>
<td>I-III</td>
<td>PB</td>
<td>Pre-op</td>
<td>38</td>
<td>DFS, OS</td>
<td>No difference, Reduced OS</td>
</tr>
<tr>
<td>Ito et al.</td>
<td>RT-PCR</td>
<td>CEA</td>
<td>99</td>
<td>43/56</td>
<td>I-III</td>
<td>PB</td>
<td>Post-op</td>
<td>26</td>
<td>DFS, OS</td>
<td>No difference, Reduced OS</td>
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<tr>
<td>Akashi et al.</td>
<td>RT-PCR</td>
<td>CEA</td>
<td>80</td>
<td>NR</td>
<td>I-III</td>
<td>MPB</td>
<td>Intra-op</td>
<td>44</td>
<td>DFS</td>
<td>No difference, Reduced OS</td>
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<tr>
<td>Bessa et al.</td>
<td>RT-PCR</td>
<td>CEA</td>
<td>66</td>
<td>NR</td>
<td>I-III</td>
<td>PB</td>
<td>Post-op (24 hr after surgery)</td>
<td>54</td>
<td>DFS, OS</td>
<td>No difference, Reduced OS</td>
</tr>
<tr>
<td>Sadahiro et al.</td>
<td>RT-PCR</td>
<td>CEA</td>
<td>93</td>
<td>NR</td>
<td>I-III</td>
<td>MPB</td>
<td>Intra-op</td>
<td>39</td>
<td>DFS, OS</td>
<td>No difference, Reduced OS</td>
</tr>
<tr>
<td>Kanellos et al.</td>
<td>RT-PCR</td>
<td>CEA</td>
<td>108</td>
<td>NR</td>
<td>I-III</td>
<td>MPB</td>
<td>Intra-op</td>
<td>11</td>
<td>DFS, OS</td>
<td>No difference, Reduced OS</td>
</tr>
<tr>
<td>Koch et al.</td>
<td>RT-PCR</td>
<td>CK20</td>
<td>90</td>
<td>52/28</td>
<td>II</td>
<td>PB</td>
<td>All patients</td>
<td>52</td>
<td>DFS, OS</td>
<td>Shorter, Reduced OS</td>
</tr>
<tr>
<td>Lloyd et al.</td>
<td>RT-PCR</td>
<td>CEA, EphB4, MAT, LAMy2</td>
<td>125</td>
<td>48/34</td>
<td>I-II</td>
<td>PB</td>
<td>Pre-op</td>
<td>3</td>
<td>DFS</td>
<td>Shorter, Reduced OS</td>
</tr>
<tr>
<td>Allen-Mersh et al.</td>
<td>RT-PCR</td>
<td>CEA</td>
<td>113</td>
<td>NR</td>
<td>I-III</td>
<td>PB</td>
<td>Post-op (&lt;24 hr after surgery)</td>
<td>30</td>
<td>DFS</td>
<td>No difference, Reduced OS</td>
</tr>
<tr>
<td>Wang et al.</td>
<td>RT-PCR (MA)</td>
<td>CK19, CK20, CEA, hTERT</td>
<td>157</td>
<td>112/45</td>
<td>I-III</td>
<td>PB</td>
<td>Post-op (&gt;14 days after surgery)</td>
<td>57</td>
<td>DFS, OS</td>
<td>No difference, Reduced OS</td>
</tr>
<tr>
<td>Uen et al.</td>
<td>RT-PCR</td>
<td>CK19, CK20, CEA, hTERT</td>
<td>194</td>
<td>NR</td>
<td>II</td>
<td>PB</td>
<td>Post-op (&gt;7 days after surgery)</td>
<td>27</td>
<td>DFS</td>
<td>No difference, Reduced OS</td>
</tr>
<tr>
<td>Sadahiro et al.</td>
<td>RT-PCR</td>
<td>CEA</td>
<td>200</td>
<td>160/40</td>
<td>I-III</td>
<td>PB</td>
<td>Post-op (day 7-10 after surgery)</td>
<td>22</td>
<td>DFS</td>
<td>No difference, Reduced OS</td>
</tr>
<tr>
<td>Uen et al.</td>
<td>RT-PCR (MA)</td>
<td>CK19, CK20, CEA, hTERT</td>
<td>438</td>
<td>282/156</td>
<td>I-III</td>
<td>PB</td>
<td>Pre-op and post-op (7 days after surgery)</td>
<td>31</td>
<td>DFS</td>
<td>No difference, Reduced OS</td>
</tr>
<tr>
<td>Lu et al.</td>
<td>RT-PCR</td>
<td>CK19, CK20, CEA, hTERT</td>
<td>141</td>
<td>141/0</td>
<td>II-III</td>
<td>PB</td>
<td>Post-op (day 7, 28 after surgery)</td>
<td>36</td>
<td>DFS, OS</td>
<td>No difference, Reduced OS</td>
</tr>
<tr>
<td>Kimura et al.</td>
<td>RT-PCR</td>
<td>CEA, CK19, CK20, CD133</td>
<td>735</td>
<td>NR</td>
<td>I-III</td>
<td>PB</td>
<td>Pre-op</td>
<td>25</td>
<td>DFS</td>
<td>No difference, Reduced OS</td>
</tr>
</tbody>
</table>

**Abbreviations:** CEA, Carcinoembryonic antigen; CK8, Cytokeratin-8; CK19, Cytokeratin-19; CK20, Cytokeratin-20; DFS, Disease-free survival; EphB4, Ephrin receptor B4; HRR, Hepatic recurrence rate; hTERT, human telomerase reverse transcriptase; Intra-op, Intra-operatively; LAMy2, Laminin-5G2; MA, Membrane array; MAT, Matrilysin; MPB, Mesenteric-portal blood; MUC2, mucin-2; NE, Not evaluated; OS, Overall survival; NR, Not reported; PB, Peripheral blood; Post-op, Post-operatively; Pre-op, Pre-operatively; RFS, Relapse-free survival; RT, Reverse-transcriptase-PCR.
Growth rates

Primary CC resection → Metastatic disease

↑ Growth rate of metastases

Linear progression model

Synchronous metastases

Estimated growth rates of primary = liver mets

Finlay Br J Surg 1988
Stricking genetic disparity

Primary CC
Disseminated tumor cells
Established metastases

Early dissemination of genetically less-advanced clones
Incompatibility with linear progression model
Number of pLNvs vs level of pLNvs

- Retrospective
- N = 1,031
  - N = 118
  - LNC > 12
  - pLNvs

1-3 pLNvs vs 
≥ 4 pLNvs

Pericolic LNvs vs 
LNvs along major vessels

Suzuki JACS 2006
Aberrant drainage of sentinel lymph nodes

- N = 192
- Sentinel lymph node mapping
• Aberrant lymphatic drainage
  – 42 pts (22%) => extended surgery

• Extended surgery: 62% pLNs <-> 43%

• 19 pts (10%) positive sentinel in aberrant location
Conclusion: nodal spread in CC

Stochastic and early process

Nodal positivity => biological behaviour of the disease

Maximizing lymphadenectomy => not affect risk of systemic spread
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<table>
<thead>
<tr>
<th>Stage migration</th>
<th>Therapeutic effects of lymphadenectomy</th>
<th>Confounding variables</th>
</tr>
</thead>
</table>

Positive correlation between lymph node count and survival

- Bernhoff Colorectal Dis 2012
- Le Voyer J Clin Oncol 2013
- Swanson Ann Surg Oncol 2003
- Chen Ann Surg 2006
- Parsons JAMA 2011
- Vather Ann Surg Oncol 2009
Stage migration
More extensive lymph node evaluation

↑ Detection rate of node-positive disease

↑ Chemotherapy

↑ Overall survival

Feinstein 1985 N Eng J Med
### Table 1
Association between node count, node involvement and survival.

<table>
<thead>
<tr>
<th>Author</th>
<th>Year</th>
<th>Country</th>
<th>Design</th>
<th>Location</th>
<th>Stage (%)</th>
<th>N</th>
<th>Node count – node positivity relation</th>
<th>Node count – survival relation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prandi²⁵</td>
<td>2002</td>
<td>Italy</td>
<td>Retrospective multicenter cohort study</td>
<td>Colon</td>
<td>II: 50.3%; III: 49.7%</td>
<td>3,248</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Bui²⁶</td>
<td>2006</td>
<td>Canada</td>
<td>Retrospective multicenter cohort study</td>
<td>Colon</td>
<td>II; III; IIIIC</td>
<td>787</td>
<td>No</td>
<td>Not investigated</td>
</tr>
<tr>
<td>Wong²⁷</td>
<td>2007</td>
<td>USA</td>
<td>Retrospective multicenter cohort study</td>
<td>Colon</td>
<td>0-III</td>
<td>30,625</td>
<td>No</td>
<td>No</td>
</tr>
<tr>
<td>Baxter²⁸</td>
<td>2010</td>
<td>USA</td>
<td>Retrospective multicenter study</td>
<td>Colon</td>
<td>II; III; IIIIC</td>
<td>110,444</td>
<td>Yes, if node count is &lt; 5-7 nodes</td>
<td>Not investigated</td>
</tr>
<tr>
<td>Parsons²¹</td>
<td>2011</td>
<td>USA</td>
<td>Retrospective multicenter study</td>
<td>Colon</td>
<td>I-IV</td>
<td>86,394</td>
<td>No</td>
<td>Yes</td>
</tr>
<tr>
<td>Porter²⁹</td>
<td>2012</td>
<td>Canada</td>
<td>Retrospective multicenter study</td>
<td>Colon</td>
<td>I; II; III</td>
<td>1,583</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

No consistent relation
LNC and survival in stage III

Le Voyer JCO 2003

Parsons JAMA 2011

Chen Ann Surg 2006
### Nodal positivity constant

**Table 1** Selected international studies demonstrating constant nodal positivity rate for colorectal cancer

<table>
<thead>
<tr>
<th>Study</th>
<th>Years</th>
<th>Country</th>
<th>Node-positive*</th>
<th>Total no. of patients</th>
<th>Cancer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bui [41]</td>
<td>2006</td>
<td>Canada</td>
<td>334</td>
<td>787</td>
<td>Colon</td>
</tr>
<tr>
<td>Hohenberger [13]</td>
<td>2009</td>
<td>Germany</td>
<td>545</td>
<td>1,438</td>
<td>Colon</td>
</tr>
<tr>
<td>Kotake [42]</td>
<td>2011</td>
<td>Japan</td>
<td>7,722</td>
<td>16,865</td>
<td>Colon</td>
</tr>
<tr>
<td>Lemmens [43]</td>
<td>2006</td>
<td>Holland</td>
<td>798</td>
<td>2,163</td>
<td>Colon</td>
</tr>
<tr>
<td>Piso [44]</td>
<td>2004</td>
<td>Germany</td>
<td>160</td>
<td>337</td>
<td>Colon</td>
</tr>
<tr>
<td>Shen [45]</td>
<td>2008</td>
<td>USA</td>
<td>206</td>
<td>434</td>
<td>Colorectal</td>
</tr>
<tr>
<td>Goldstein [22]</td>
<td>2002</td>
<td>USA</td>
<td>1,122</td>
<td>2,427</td>
<td>Colorectal</td>
</tr>
<tr>
<td>Rullier [46]</td>
<td>2008</td>
<td>France</td>
<td>197</td>
<td>495</td>
<td>Colorectal</td>
</tr>
<tr>
<td>Akasu [47]</td>
<td>2008</td>
<td>Japan</td>
<td>48</td>
<td>120</td>
<td>Colorectal</td>
</tr>
<tr>
<td>Gunderson [48]</td>
<td>2009</td>
<td>USA</td>
<td>13,807</td>
<td>35,829</td>
<td>Rectal</td>
</tr>
<tr>
<td>Meguid [49]</td>
<td>2008</td>
<td>USA</td>
<td>28,792</td>
<td>73,324</td>
<td>Rectal</td>
</tr>
<tr>
<td>Wang [50]</td>
<td>2010</td>
<td>China</td>
<td>908</td>
<td>2,340</td>
<td>Colorectal</td>
</tr>
<tr>
<td>Evans [51]</td>
<td>2011</td>
<td>UK</td>
<td>95</td>
<td>213</td>
<td>Colorectal</td>
</tr>
<tr>
<td>Rosenberg [52]</td>
<td>2010</td>
<td>Germany</td>
<td>7,654</td>
<td>17,309</td>
<td>Colorectal</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td>97,971</td>
<td>240,081</td>
<td></td>
</tr>
</tbody>
</table>

* Overall nodal positivity rate = \( \frac{97,971}{240,081} \times 100 \% = 40.8 \% \)
Therapeutic effects of lymphadenectomy
Stage II

Extensive lymphadenectomy
isolated tumor cells

\[\text{Improved survival?}\]

Stage III
## Conventional vs extensive surgery

Conventional surgery versus extensive resection in terms of lymph node count, node positivity rate and survival.

<table>
<thead>
<tr>
<th>Author</th>
<th>Year</th>
<th>Country</th>
<th>Design</th>
<th>Location</th>
<th>Stage (%)</th>
<th>N</th>
<th>Surgical technique</th>
<th>Node count</th>
<th>Node positivity rate</th>
<th>Survival</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rouffet</td>
<td>1994</td>
<td>France</td>
<td>Prospective multicenter study</td>
<td>Left</td>
<td>I–IV</td>
<td>260</td>
<td>Left segmental colectomy vs left hemicolectomy</td>
<td>Not investigated</td>
<td>No difference</td>
<td>No difference</td>
</tr>
<tr>
<td>Tagliacozzo</td>
<td>1997</td>
<td>Italy</td>
<td>Retrospective single center study</td>
<td>Right</td>
<td>I: 24.3%</td>
<td>144</td>
<td>Right hemicolectomy vs right hemicolectomy + retropancreatic lymphadenectomy</td>
<td>More nodes after radical resection</td>
<td>No difference</td>
<td>No difference</td>
</tr>
<tr>
<td>Tentes</td>
<td>2007</td>
<td>Greece</td>
<td>Prospective single center study</td>
<td>Left</td>
<td>I: 10.5%</td>
<td>124</td>
<td>Left hemicolectomy vs left hemicolectomy + periaortic lymphadenectomy</td>
<td>More nodes after radical resection</td>
<td>No difference</td>
<td>No difference except longer survival after radical resection for stage III</td>
</tr>
<tr>
<td>West</td>
<td>2010</td>
<td>UK/Germany</td>
<td>Prospective and retrospective multicenter study</td>
<td>Colon</td>
<td>I–IV</td>
<td>89</td>
<td>Hemicolecotmy versus CME(^a)</td>
<td>More nodes after CME(^a)</td>
<td>No difference</td>
<td>Not investigated</td>
</tr>
<tr>
<td>Hashiguchi</td>
<td>2011</td>
<td>Japan</td>
<td>Retrospective single center study</td>
<td>Colon</td>
<td>I–IV</td>
<td>914</td>
<td>Left hemicolectomy with variable extent of lymph node dissection</td>
<td>More nodes after vertical dissection</td>
<td>No difference</td>
<td>Shorter if no vertical node dissection. No influence of main node removal or extent of horizontal node dissection</td>
</tr>
<tr>
<td>West</td>
<td>2012</td>
<td>Japan/Germany</td>
<td>Retrospective multicenter study</td>
<td>Colon</td>
<td>I–IV</td>
<td>254</td>
<td>D3 resection vs CME(^a)</td>
<td>More nodes after CME(^a)</td>
<td>No difference</td>
<td>Not investigated</td>
</tr>
</tbody>
</table>

\(^a\) CME, complete mesocolic excision.

Willaert Cancer Treat Rev 2013
Retrospective
N = 914
T2-T4 CC

Hashiguchi Br J Surg 2011
High tie vs low tie in CRC

- Meta-analysis:
- 11 non-randomized studies
- 4,281 **high tie** vs 4,385 **low tie**

Figure 8. Overall 5-year survival in patients undergoing colon resection.

Cirocchi Surg Oncol 2012
Confounding variables
Table 1 Variables confounding the association between nodal count and survival in colorectal cancer

<table>
<thead>
<tr>
<th>Confounding variables</th>
<th>Effect on LNC</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Patient characteristics</strong></td>
<td></td>
</tr>
<tr>
<td>Age, socioeconomic status, non-Caucasian race</td>
<td>↓</td>
</tr>
<tr>
<td>gender, body mass index</td>
<td></td>
</tr>
<tr>
<td><strong>Tumor characteristics</strong></td>
<td></td>
</tr>
<tr>
<td>Tumor diameter, T stage, overall cancer stage, lymphocytic infiltration, MSI-H phenotype</td>
<td>↑</td>
</tr>
<tr>
<td>Tumor grade</td>
<td>↓</td>
</tr>
<tr>
<td>Mucinous differentiation, lymphovascular and perineural invasion</td>
<td>↑</td>
</tr>
<tr>
<td><strong>Surgical factors</strong></td>
<td>None</td>
</tr>
<tr>
<td>Open vs minimally invasive resection</td>
<td></td>
</tr>
<tr>
<td>Colorectal vs general surgeons, advanced fellowship training</td>
<td>↑</td>
</tr>
<tr>
<td>Surgeon volume</td>
<td></td>
</tr>
<tr>
<td><strong>Institutional factors</strong></td>
<td></td>
</tr>
<tr>
<td>High-volume centers, teaching hospitals, significant CC surgical practice, academic pathology laboratories</td>
<td>↑</td>
</tr>
<tr>
<td>Preoperative radiochemotherapy for rectal cancer</td>
<td></td>
</tr>
<tr>
<td><strong>Factors related to pathology examination</strong></td>
<td></td>
</tr>
<tr>
<td>Xylene/alcohol fat clearance, embedding of the entire mesentery vs traditional dissection, ex vivo intra-arterial methylene blue injection, tattooing of neoplasms during colonoscopy, pathologists interested in CRC, use of a standardized protocol to evaluate CC specimens</td>
<td>↑</td>
</tr>
</tbody>
</table>
Conclusion: nodal count and survival in CC

*No evidence*: extensive surgery improves survival

**Therapeutic** effects of extensive lymphadenectomy are *unlikely* to explain the correlation between nodal count and survival
• Variations in LNC
  – the surgeon, pathologist and institutional level

• Unclear whose quality is being addressed

• Implementation of **standard procedures**
  – Resection
  – Pathology examination
Overview

• Complete mesocolic excision (CME)
• Nodal spread in Colon Cancer (CC)
• Nodal count and survival in CC
• **Local recurrence in CC**
• CME: current clinical evidence
• Conclusions
• 2,282 CC
  – Stage I-IIIC
• Local recurrence
  – Regrowth in or nearby the primary site
  – 127 (6.4 %) within 5y
• Risk factors
  – Left sided
  – T3 –T4
  – pLNs
  – No adjuv chemotherapy
• 994 CC; 844 RC
  – Curative resection
• Median FU: 61 months
• Recurrence rate
  – CC: 6.1%
  – RC: 11.3% \( P<0.001 \)
• Risk factors
  – pT stage
  – pN stage
  – Lymphovascular infiltration

Fig. 1 The distribution chart of local recurrences according to interval from surgery

Table 1 The distribution of local recurrences

<table>
<thead>
<tr>
<th>Type</th>
<th>Number of patients</th>
<th>Curative operation</th>
<th>Palliative operation</th>
<th>No operation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anastomosis or perianastomosis</td>
<td>45</td>
<td>27</td>
<td>7</td>
<td>10</td>
</tr>
<tr>
<td>Pelvic cavity</td>
<td>28</td>
<td>2</td>
<td>1</td>
<td>26</td>
</tr>
<tr>
<td>Regional LN</td>
<td>9</td>
<td>2</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Others(^a)</td>
<td>91</td>
<td>35</td>
<td>(8.8%)</td>
<td>48 (52.7%)</td>
</tr>
</tbody>
</table>

\(^a\)Abdominal 10% recurrence in LNs

Yun Int J Colorectal Dis 2008
Conclusion: local recurrence in CC

- Available data are very limited
- Seems to be a rare event
- Associated with advanced disease
- Risk of isolated recurrence due to incomplete mesenteric removal seems to be very low
Overview

- Complete mesocolic excision (CME)
- Nodal spread in Colon Cancer (CC)
- Nodal count and survival in CC
- Local recurrence in CC
- CME: current clinical evidence
- Conclusions
• Retrospective studies
• Few studies: CME <-> standard surgery
CME vs Standard resection

- CME: 49 vs Standard: 40
- CME:
  - More tissue removed ($P < 0.0001$)
  - Greater LNC ($P < 0.0001$)
  - No difference in pLNs
  - No survival data
CME vs Japanese D3 resection

- CME: 136 vs D3: 118
- D3
  - Smaller amount
    - men petroly (P < 0.001)
    - LNs (P < 0.001)
  - No difference in pLN
  - No survival data

West JCO 2012
CME vs D2 resection

- Hospital A:
  - N = 84
  - CME
  - Prospective

- Hospitals B and C
  - N = 105
  - D2
  - Retrospective

3y-OS: 88.1 %  
3y-DFS: 82.1 %

P = 0.003

3y-OS: 79.0 %  
3y-DFS: 74.3 %

P = 0.026

Storli Tech Coloproctol 2014
• Prospective vs retrospective data
• Short term results
• Stage III-IV excluded
• ≠ pathological fixation
CME vs standard resection

- Monocentric
- Right hemicolon
- CME (N = 45)
  - Prospective
- Standard (N = 58)
  - Retrospective

- CME:
  - ↑ LNC (P=0.0013)
- Recurrence
  - 13.3% vs 13.7% (P=0.26)
- Local recurrence
  - 21 vs 0 (P=0.034)
• Classic: more advanced pT stages
• Standard: mesocolic plane rate unknown
• RCT needed
Conclusion: CME: current clinical evidence

No robust conclusions regarding survival benefit from CME can be drawn

Introduction of CME highlights the importance of precise surgical management of CC and constitutes nothing more than good surgical practice

More extensive resection in order to prevent local recurrence is currently unfounded
Take home message

- Lymph node metastasis is an early process
- No evidence that extensive lymphadenectomy ↑ survival
- LNC ~ survival: confounded by several factors
- Aim of lymphadenectomy:
  - staging and estimation of prognosis