Pushing the limits

Simultaneous colon and liver resection

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Laparoscopy for CR cancer

The Long-term Results of a Randomized Clinical Trial of Laparoscopy-assisted Versus Open Surgery for Colon Cancer

Antonio M. Lacy, MD, PhD,* Salvador Delgado, MD, PhD,* Antoni Castells, MD, PhD,† Hubert A. Prins, MD, PhD,* Vicente Arroyo, MD, PhD,† Ainitze Ibarzabal, MD, PhD,* and Josep M. Pique, MD, PhD†

Laparoscopic Colectomy for Cancer Is Not Inferior to Open Surgery Based on 5-Year Data From the COST Study Group Trial

James Fleshman, MD,* Daniel J. Sargent, PhD,† Erin Green, BS,† Mehran Anvari, MD,‡ Steven J. Stryker, MD,§ Robert W. Beart, Jr, MD,¶ Michael Hellinger, MD,‖ Richard Flanagan, Jr, MD,** Walter Peters, MD,†† and Heidi Nelson, MD,§§ for The Clinical Outcomes of Surgical Therapy Study Group††

Randomized Trial of Laparoscopic-Assisted Resection of Colorectal Carcinoma: 3-Year Results of the UK MRC CLASICCC Trial Group

David G. Jayne, Pierre J. Guillou, Helen Thorpe, Philip Quirke, Joanne Copeland, Adrian M.H. Smith, Richard M. Heath, and Julia M. Brown
Minimally Invasive Liver Resection for Metastatic Colorectal Cancer

A Multi-Institutional, International Report of Safety, Feasibility, and Early Outcomes

Kevin Tri Nguyen, MD, PhD,* Alexis Laurent, MD, PhD,† Ibrahim Dagher, MD, PhD,‡ David A. Geller, MD,*
Jennifer Steel, PhD* Mark T. Thomas, MD,§ Michael Marvin, MD,¶ Kadiyala V. Ravindra, MD,¶
Alejandro Mejia, MD,‖ Panagiotis Lainas, MD,‡ Dominique Franco, MD, PhD,† Daniel Cherqui, MD,†
Joseph F. Buell, MD,¶ and T. Clark Gamblin, MD, MS**

Oncologic Results of Laparoscopic Versus Open Hepatectomy for Colorectal Liver Metastases in Two Specialized Centers

Denis Castaing, MD,*†‡ Eric Vibert, MD,*†‡ Luana Ricca, MD,*§¶ Daniel Azoulay, MD, PhD,* Rene Adam, MD, PhD,* and Brice Gayet, MD§¶ (Ann Surg 2009;250: 849–855)
Laparoscopy for CR metastases

The impact of laparoscopic versus open colorectal cancer surgery on subsequent laparoscopic resection of liver metastases: A multicenter study

Francesco Di Fabio, MD, EBSQ,a Leonid Barkhatov, MD,b,c Italo Bonadio, MD,b Eleonora Dimovska, MBBS,d Åsmund A. Fretland, MD,b,c Neil W. Pearce, DM, FRCS,d Roberto I. Troisi, MD, PhD, FEBS,e Bjørn Edwin, MD, PhD,b,c and Mohammed Abu Hilal, MD, PhD, FRCS,d Southampton, UK, Oslo, Norway, and Ghent, Belgium

Long-term and perioperative outcomes of laparoscopic versus open liver resection for colorectal liver metastases with propensity score matching: a multi-institutional Japanese study


Laparoscopic Versus Open Liver Resection for Colorectal Metastases in Elderly and Octogenarian Patients

A Multicenter Propensity Score Based Analysis of Short- and Long-term Outcomes

David Martínez-Cecilia, MD, PhD,* Federica Cipriani, MD,**† Shelat Vishaal, MD,* Francesca Ratti, MD,† Hadrien Tranchart, MD,‡ Leonid Barkhatov, MD,¶ Federico Tomassini, MD,**§ Roberto Montalti, MD,**§ Mark Halls, MBBS,* Roberto I. Troisi, MD, PhD,**§ Ibrahim Dagher, MD, PhD,**§ Luca Aldighetti, MD,**§ David M. Long, MD,† Bjørn Edwin, MD, PhD,¶|| and Mohammad Abu Hilal, MD, FRCS, FACS, PhD*
Laparoscopy for CR metastases

- Reduce parietal injury and adhesions in multioperated patients
- Facilitate a two-step surgery
- For synchronous liver metastases
Simultaneous CR and liver resections

Laparoscopic major hepatectomy can be safely performed with colorectal surgery for synchronous colorectal liver metastasis

Hadrien Tranchart¹, Papa Saloum Diop¹, Panagiotis Lainas¹, Guillaume Pourcher¹, Laurence Catherine², Dominique Franco¹,³ & Ibrahim Dagher¹,³

HPB 2011, 13, 46–50

Comparison of laparoscopic and open colorectal resections for patients undergoing simultaneous R0 resection for liver metastases

Jung Wook Huh · Yang Seok Koh · Hyeong Rok Kim · Chol Kyoong Cho · Young Jin Kim

DOI 10.1007/s00464-010-1158-z

Short-Term Outcomes of Simultaneous Laparoscopic Colectomy and Hepatectomy for Primary Colorectal Cancer With Synchronous Liver Metastases

Akira Inoue, Mamoru Uemura, Hirofumi Yamamoto, Masayuki Hiraki, Atsushi Naito, Takayuki Ogino, Ryoji Nonaka, Junichi Nishimura, Hiroshi Wada, Taishi Hata, Ichiro Takemasa, Hidetoshi Eguchi, Tsunekazu Mizushima, Hiroaki Nagano, Yuichiro Doki, Masaki Mori

Int Surg 2014;99:338–343
Lap Simultaneous CR and liver resections

Laparoscopic Simultaneous Resection of Colorectal Primary Tumor and Liver Metastases: Results of a Multicenter International Study

Stefano Ferretti¹ · Hadrien Tranchart¹ · Joseph F. Buell² · Constantino Eretta³ · Alberto Patriti⁴ · Marcello Giuseppe Spampinato⁵ · Jung Wook Huh⁶ · Luca Vigano⁷ · Ho Seong Han⁸ · Giuseppe Maria Ettorre⁹ · Elio Jovine¹⁰ · Thomas Clark Gamblin¹¹ · Giulio Belli¹² · Go Wakabayashi¹³ · Brice Gayet¹⁴ · Ibrahim Dagher¹

DOI 10.1007/s00268-015-3034-4
Lap Simultaneous CR and liver resections

All types of colorectal resection as well as all types of liver resection.

142 simultaneous resections.
Lap Simultaneous CR and liver resections

- 72.5% Right Hep (N=7)
- 15.5% Left Hep (N=5)
- 9.2% LLS (N=9)
- 2.8% Wedge+Segm (N=21)

- 32.4% Left Colon (N=19)
- 40.8% Right Colon (N=13)
- 26.8% Rectum (N=10)
Major Hepatectomy:

Left Hepatectomy

2 Right Colon Resection
1 Left Colon Resection
1 Rectal Resection

Right Hepatectomy

4 Right Colon Resection
9 Left Colon Resection
<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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<tbody>
<tr>
<td><strong>Age, y (range)</strong></td>
<td>66 (32-85)</td>
</tr>
<tr>
<td><strong>BMI, Kg/m² (range)</strong></td>
<td>24.3 (18.3-38)</td>
</tr>
<tr>
<td><strong>Liver Mets N° (range)</strong></td>
<td>1 (1-9)</td>
</tr>
<tr>
<td><strong>Largest Mets (range)</strong></td>
<td>5 cm</td>
</tr>
<tr>
<td><strong>Localization</strong></td>
<td>97 % unilobar</td>
</tr>
<tr>
<td><strong>Totally Laparoscopic, n (%)</strong></td>
<td>127 (89.4)</td>
</tr>
<tr>
<td><strong>Hand assisted, n (%)</strong></td>
<td>15 (10.6)</td>
</tr>
<tr>
<td><strong>Colorectal resection time, min (range)</strong></td>
<td>156 (80-405)</td>
</tr>
<tr>
<td><strong>Liver resection time, min (range)</strong></td>
<td>120 (35-600)</td>
</tr>
<tr>
<td><strong>Total operative time, min (range)</strong></td>
<td>292 (112-690)</td>
</tr>
<tr>
<td><strong>Stoma, n (%)</strong></td>
<td>5 (3.5%)</td>
</tr>
<tr>
<td><strong>Conversion, n (%)</strong></td>
<td>7 (4.9%)</td>
</tr>
<tr>
<td><strong>Blood loss, n (%)</strong></td>
<td>200 ml (0-1800)</td>
</tr>
</tbody>
</table>
Lap Simultaneous CR and liver resections

Table 4: Postoperative results for patients undergoing laparoscopic liver resection with simultaneous colorectal surgery for synchronous colorectal liver metastases

<table>
<thead>
<tr>
<th>Variable</th>
<th>Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mortality, n (%)</td>
<td>3 (2.1)</td>
</tr>
<tr>
<td>Specific morbidity, n (%)</td>
<td>22 (15.5)</td>
</tr>
<tr>
<td>Colorectal morbidity, n (%)</td>
<td>11 (7.7)</td>
</tr>
<tr>
<td>Leakage, n</td>
<td>8</td>
</tr>
<tr>
<td>Abdominal abscess, n</td>
<td>1</td>
</tr>
<tr>
<td>Segmental ischemic colitis, n</td>
<td>1</td>
</tr>
<tr>
<td>Prolonged ileus, n</td>
<td>1</td>
</tr>
<tr>
<td>Liver morbidity, n (%)</td>
<td>11 (7.7)</td>
</tr>
<tr>
<td>Ascites, n</td>
<td>1</td>
</tr>
<tr>
<td>Liver failure, n</td>
<td>1</td>
</tr>
<tr>
<td>Biliary collection, n</td>
<td>6</td>
</tr>
<tr>
<td>Hemorrhage, n</td>
<td>3</td>
</tr>
</tbody>
</table>

General morbidity, n (%)        22 (15.5)
Heart failure, n                1
Pulmonary, n                     7
Incisional abscess, n            3
Acute renal failure, n           1
Distal deep vein thrombosis, n   1
Urinary tract infection, n       2
Pancreatitis, n                  1
Cholangitis due to bile duct stone, n  1
Multi organ failure, n           1
Acute coronary syndrome, n       2
Central venous catheter infection, n  1
Unexplained fever, n             1

Clavien classification
Grades I, II, IIIa, IIIb, IVa, IVb, V  2/14/9/11/5/0/3
Reoperation, n (%)                11 (7.7)
First oral intake of solid food (d), median (range) 3 (1–20)
Intensive care unit stay (d), median (range) 1 (1–16)
Hospital stay (d), median (range) 8 (3–84)
Lap Simultaneous CR and liver resections

Follow up: 29 months (1-108)

Overall Survival

1-year: 98.8%
3-year: 82.1%
5-year: 71.9%

Disease-Free Survival

1-year: 85.6%
3-year: 65.9%
5-year: 63%
Laparoscopic simultaneous resection of colorectal primary tumor and liver metastases: a propensity score matching analysis

Hadrien Tranchart\textsuperscript{1,2} · David Fuks\textsuperscript{3} · Luca Vigano\textsuperscript{4,5} · Stefano Ferretti\textsuperscript{1,2} · François Paye\textsuperscript{6} · Go Wakabayashi\textsuperscript{7} · Alessandro Ferrero\textsuperscript{4} · Brice Gayet\textsuperscript{3} · Ibrahim Dagher\textsuperscript{1,2}

DOI 10.1007/s00464-015-4467-4
Laparoscopic simultaneous resection of colorectal primary tumor and liver metastases: a propensity score matching analysis

Hadrien Tranchart¹,² · David Fuks³ · Luca Vigano⁴,⁵ · Stefano Ferretti¹,² · François Paye⁶ · Go Wakabayashi⁷ · Alessandro Ferrero⁴ · Brice Gayet³ · Ibrahim Dagher¹,²

DOI 10.1007/s00464-015-4467-4

**Overall Survival**

- **Laparoscopic**
  - 1-year: 97%
  - 3-year: 78%

- **Open**
  - 1-year: 94%
  - 3-year: 65%

\[ p = 0.17 \]

**Disease-Free Survival**

- **Laparoscopic**
  - 1-year: 79%
  - 3-year: 64%

- **Open**
  - 1-year: 78%
  - 3-year: 52%

\[ p = 0.13 \]
Simultaneous laparoscopic liver and CR resections are feasible, safe and associated with good short-term results and oncological outcomes in highly selected patients and well-experienced centers.

By improving the tolerance of each procedure, laparoscopy should allow to expand indications for simultaneous liver and CR resections.
Pushing the limits

Simultaneous colon and liver resection

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