Early (or Late?) Diagnostics vs. Migration of CRC Patients in Therapeutic Burden of Comprehensive Cancer Centers

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Part I.

Introducing Faculty Hospital Brno and Its Cancer Burden
Faculty Hospital Brno can serve as a fully representative example of comprehensive cancer centers (CCCs) in the Czech Republic. Regional population in its tributary area fully corresponds to the demographic profile of the whole Czech population.
Epidemiology of colorectal cancer in South Moravia Region

Age of patients
period 2006 - 2010

Proportion according to age category (%)

Age
Mean 69 yrs
Median 70 yrs
Quartiles 61-78 yrs

Stage of the disease

N = 4,268

Period 2006-2010

<table>
<thead>
<tr>
<th>Stage</th>
<th>Annual number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stage I</td>
<td>174 (20.4%)</td>
</tr>
<tr>
<td>Stage II</td>
<td>187 (21.9%)</td>
</tr>
<tr>
<td>Stage III</td>
<td>181 (21.2%)</td>
</tr>
<tr>
<td>Stage IV</td>
<td>211 (24.7%)</td>
</tr>
<tr>
<td>Stage unknown - objective reasons</td>
<td>70 (8.2%)</td>
</tr>
<tr>
<td>Stage unknown - incomplete data</td>
<td>31 (3.6%)</td>
</tr>
<tr>
<td>Total</td>
<td>854 (100%)</td>
</tr>
</tbody>
</table>

Source: National Cancer Registry of the Czech Republic
First line treatment of cancer patients in FHB („hospital volume“; 2007-2010)

Faculty Hospital Brno is one of the biggest high volume cancer center in the Czech Republic which is the consequence of ever growing cancer burden in the region.

High therapeutic load requires specific managerial and economic conditions to maintain the care effective.

Source: National Cancer Registry of the Czech Republic
Part II.

Problems Associated with Comprehensive Care for CRC in the Czech Republic
Case mix of FHB in treated CRC patients:
benchmarking against epidemiological (population) data

FHB is overloaded by CRC patients in advanced clinical stage.
The same problem can be found in nearly all CCCs in the country.

Source: National Cancer Registry of the Czech Republic
High incidence of CRC patients coming with advanced disease is long term and stable. Advanced CRC is primarily diagnosed with the same incidence as less advanced stages I+II – this situation is really alarming.
PROBLEM II. Clinical and geographical migration of patients

<table>
<thead>
<tr>
<th>Clinical migration according to first line of treatment</th>
<th>Geographic migration according to place of living</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>South Moravia</td>
<td>Other region</td>
</tr>
<tr>
<td>A0: resident patients, all primary therapy in FHB</td>
<td>522 (16.4%)</td>
<td>42 (1.3%)</td>
</tr>
<tr>
<td>A1: patients migrating during primary therapy, part of therapy in FHB</td>
<td>395 (12.4%)</td>
<td>116 (3.6%)</td>
</tr>
<tr>
<td>A2-AT: anti-tumor therapy in hospital, primary therapy elsewhere</td>
<td>206 (6.5%)</td>
<td>97 (3.0%)</td>
</tr>
<tr>
<td>A2-CC: only continuing care in FHB, primary therapy elsewhere</td>
<td>1436 (45.0%)</td>
<td>374 (11.7%)</td>
</tr>
<tr>
<td>Celkem</td>
<td>2559 (80.3%)</td>
<td>629 (19.7%)</td>
</tr>
</tbody>
</table>

* only patients with known place of living

Migration of patients to the CCCs is expectable trend, which however opens new challenges for the management of cancer care:
- nearly **20%** of FHB patients come from the other regions (which have their own CCC !)
- **16%** of CRC patients migrate during the course of their primary therapy !
- further approx. **10%** of CRC patients migrate at the time of relapse of primary disease

Source: FHB data + National Cancer Registry of the Czech Republic
### PROBLEM II. Clinical and geographical migration of patients

#### CRC patients with stage 3+4 treated in Faculty Hospital Brno*

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<td>South Moravia</td>
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<tr>
<td><strong>A0:</strong> resident patients, all primary therapy in FHB</td>
<td>242 (17.2%)</td>
<td>23 (1.6%)</td>
</tr>
<tr>
<td><strong>A1:</strong> patients migrating during primary therapy, part of therapy in FHB</td>
<td>180 (12.8%)</td>
<td>63 (4.5%)</td>
</tr>
<tr>
<td><strong>A2-AT:</strong> anti-tumor therapy in hospital, primary therapy elsewhere</td>
<td>117 (8.3%)</td>
<td>48 (3.4%)</td>
</tr>
<tr>
<td><strong>A2-CC:</strong> only continuing care in hospital, primary therapy elsewhere</td>
<td>561 (39.8%)</td>
<td>177 (12.5%)</td>
</tr>
<tr>
<td><strong>Celkem</strong></td>
<td>1100 (78.0%)</td>
<td>311 (22.0%)</td>
</tr>
</tbody>
</table>

* only patients with known place of living

Migration of patients is even more apparent in CRC patients diagnosed with advanced disease. It further increases the load of the CCC in very demanding segment of cancer care.
Comprehensive cancer centers (CCC)

- 13 CCC in Czech Republic
- Covers the whole Czech region, that prevents migration
- Offers a comprehensive care to CRC´s patients
Case report

- Female 57 years old
- Family history: negative
- Personal history: hypertension, hemorrhoids, operation – 0
- Present status: spring 2011 – enterorrhagia occasionally
  autumn 2011 – diarrhea

**Regional Oncological Centre**

*Coloscopy with biopsy:* semicircular stenotic tumor in 7cm, extensive, partially necrotic, endoscope passable, polyps in 20-25cm

*Histology:* adenoCa of rectum, adenomous polyp of sigmoid colon

*US of abdomen:* multiple bilobar liver metastases, cholecystolithiasis

- **Primary indication:** paliative chemotherapy
CT of abdomen 12/2011 – meta S2/5, S6, S7, S8

- First investigation in CCC FN Brno 12/2011

- Tumor markers – CEA 11.63, Ca 19-9 12.8
Chemobiotherapy

- Xelox + Avastin => 4 cycles, finished 1.3.2012
- Restaging: CEA 5.7, Ca 19-9 in the standard,

- CT – RECIST – PR

- Multidisciplinary team consensus 26.3.2012:
  1. LIVER FIRST – staged resection with PVE
  2. Resection of primary rectal cancer
19.4.2012 – non-anatomical resection of segm. II/III
25.4.2012 – PVE (right portal vein branch)
• 25.5.2012
• Liver volume cca 2096 ml / Left lobe volume cca 850 ml (40%)

Volume 849.4 cc
2nd stage

- **6.6.2012** — right hepatectomy

- **07/2012** — short course radiotherapy

- **18.7.2012** — LAR, TME, protective loop ileostomy
  
  Histology: ypT3 ypN1b (3/7)

- **25.7.2012** — early loop ileostomy removal
• Department of Surgery Faculty Hospital Brno
  01/2010 – 12/2011

• Colorectal surgery (benign and malignant diseases) – 810

• Overall (colorectal cancer) – 252

• Elective – 206 (81.7%)

• Acute – 46 (18.3%)
  → ileus 36 (14.3%)
  → perforation 7 (3.0%)
  → bleeding 3 (1.2%)
• **Life-threatening disease** (co-morbidities, performance status, age, nutrition …)

• **Acute life–saving operation**
  - Increasing of morbidity and mortality *(no bowel preparation)*
  - Increasing of permanent and temporary o-stomies
  - Re-operations – staged operations (2,3–stages)

• **Higher risk of minor oncological radicality**
Statistics

• **Morbidity and Mortality**

The Clavien – Dindo Classification of Surgical Complications

• **Mortality** – 8 (17.4%) (elective 1%*)

  Etiology: generalization – 5x
  MODS – 2x
  Pulmonary embolism – 1x

• **Morbidity** – 23 (50%) (elective 10-40%*)

  **Surgical complications** – 13x
  SSI – 11x
  Colon perforation – 1x
  Anastomosis dehiscence – 1x

  **Non-surgical complications** – 10x
  Bronchopneumonia – 2x
  ARDS – 2x
  Urinary infection – 3x
  Myocardial infarction – 1x
  Hypertension – 2x

Part III.

Conclusions:

1. What is wrong in comprehensive care for CRC?
2. What should be changed?
3. What are the health care outcomes in current situation?
CONCLUSIONS

High and increasing cancer burden of comprehensive cancer centers should be supported with optimized economic plan – which is not true nowadays.

There is lack of collaboration among high volume and the other centers which increases proportion of migrating patients, searching for the care.

High incidence of advanced CRC disease is alarming and nearly unsustainable – effective support of early detection programmes is necessary.

BUT anyway, we can reach and maintain promising outcomes in survival of our patients ….although we cannot save lives when the CRC diagnosis is too late
One-year mortality of CRC patients treated in Faculty Hospital Brno: comparison with the whole Czech Republic (cohort 2005-2009)

"Age & stage" adjusted and age adjusted estimations are given for overall mortality and stage-specific mortality, respectively.

One-year mortality [%]

Overall:
One-year mortality (C18-C21)

Stage 1+2:
One-year mortality (C18-C21)

Stage 3+4:
One-year mortality (C18-C21)

Stage 1:
One-year mortality (C18-C21)

Stage 2:
One-year mortality (C18-C21)

Stage 3:
One-year mortality (C18-C21)

Stage 4:
One-year mortality (C18-C21)

Num. of patients

Difference Δ

558*  -4,1%

258  -3,1%

284  -4,9%

126  -3,3%

132  -2,6%

150  -0,5%

134  -11,2%

*Including 16 patients with unknown stage.
Five-year relative survival of CRC patients treated in Faculty Hospital Brno: comparison with the whole Czech Republic (period analysis 2005-2009)

“Age & stage” adjusted and age adjusted estimations are given for overall relative survival and stage-specific relative survival, respectively.

*Including 35 patients with unknown stage.
Thank you for your attention