Interactive Case Discussion

Nutrition multimodal support of an adult with oesophageal cancer

Roberto Biffi (Italy)
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Roberto Biffi, MD
Director
Division of Abdomino-Pelvic Surgery
European Institute of Oncology
Milano - ITALY
Oesophageal cancer - features

- The incidence of esophagus epidermoidal cancer is declining in the West, whereas adenocarcinoma of the lower esophagus is increasing, due to unknown risk factors, possibly involving Barrett’s metaplasia. Europe: >34,000 new cases/year. Italy: 2,000 (North-East).

- Overall 5-year survival rate is usually under 5%, depending on the initial stage of the disease. Surgery is the only cure for esophageal cancer, possibly integrated with radiation therapy and chemotherapy, both in adjuvant and neo-adjuvant settings.

- Surgical morbidity exceeds 40%, and surgery-related mortality rate is ranging between 5 and 10% in large clinical series and experience of leading centers.

- Variable degree of malnutrition is almost always associated to the disease, and it is a well known risk factor for outcome.
The medical history

• A 50-yr-old male patient presented with a 4-month history of dysphagia and slight upper abdominal pain.

• He had no drinking but previous smoking history. No evidence of previous GERD.

• There were no abnormalities noted on physical examination or laboratory blood and chemical findings (GP assessment).
The diagnosis

• G.I. barium series and oesophago-gastro-duodenoscopy showed a substenotic lesion of the distal esophagus, extending to gastro-oesophageal junction (Siewert type I lesion).

• Histology : moderately differentiated adenocarcinoma (G2).
The oncologic staging

- Preoperative ultrasonographic staging showed uT2 uN1 endo-esophageal lesion.

- CT scan did not show any distant deposits, confirming the presence of peri-oesophageal nodes.

- Stage II B
EUS image from the distal esophagus shows a view of the tumor (T) disrupting the normal 5 layers of the esophageal wall (arrows). Malignant lymph nodes (LN) are present around the tumor. A = aorta.
## UICC-TNM Staging System – Oesophageal cancer

<table>
<thead>
<tr>
<th>Stage</th>
<th>Description</th>
</tr>
</thead>
</table>
| **Stage 0**  
(Tis, N0, M0) | This is the earliest stage of esophageal cancer. This stage is also called *carcinoma in situ*, meaning that cancer cells are limited to the epithelium. |
| **Stage I**  
(T1, N0, M0) | Esophageal cancer has invaded from the epithelium into the lamina propria or the submucosa. The cancer has not grown any deeper and has not spread to lymph nodes or to distant sites. |
| **Stage IIA**  
(T2 or 3, N0, M0) | The cancer has invaded the muscularis propria and may extend through that layer into the adventitia, the connective tissue covering the outside of the esophagus. The cancer has not spread to lymph nodes or distant sites. |
| **Stage IIB**  
(T1 or 2, N1, M0) | The cancer may invade the lamina propria, submucosa, and the muscularis propria, but not the adventitia. However, it has spread to lymph nodes near the esophagus, but not to distant sites. |
| **Stage III**  
(T3, N1, M0; OR T4, N0 or 1, M0) | Cancers in this stage have spread to the adventitia and to lymph nodes near the esophagus, or they have spread beyond the adventitia into nearby organs, such as the trachea (windpipe), and may or may not have spread to the lymph nodes. The cancer has not spread to lymph nodes farther away from the esophagus or to distant sites. |
| **Stage IV A**  
(any T, any N, M1a) | This stage indicates that the esophageal cancer has spread to distant lymph nodes. If the esophageal cancer is in the upper part of the chest, it has spread to lymph nodes in the neck. For cancer of the lower part of the esophagus, it has spread to lymph nodes in the abdomen. |
| **Stage IVB**  
(any T, any N, M1b) | This stage indicates that the esophageal cancer has spread to more distant lymph nodes or other distant sites, such as the liver, bones, or brain. |
Therapeutic plan: 2 options

Surgery → Adjuvant CT → Follow-up

4 - 6 months

Neo-Adjuvant CT → Surgery → Adjuvant CT

3 months
Therapeutic plan: decision

Surgery  Adjuvant CT  Follow-up

4 - 6 months
Nutritional assessment

**BODY WEIGHT – BMI ** *

<table>
<thead>
<tr>
<th>Date</th>
<th>Body weight (kg)</th>
<th>BMI</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>July 2007</td>
<td>74</td>
<td>23.62</td>
<td>Usual body weight</td>
</tr>
<tr>
<td>October 2007</td>
<td>68.2 (-9.4%)</td>
<td>21.76</td>
<td>Body weight before surgery</td>
</tr>
</tbody>
</table>

* Height: 1.77 m
**SGA: Grade C**

### MEDICAL HISTORY

1. **Weight Change**
   - Clothing Size
   - No Change
   - Change
   - Overall loss in past month: ____________ 6 months ____________ 1 year
   - % Loss of usual weight
     - ____________ < 5%
     - ____________ 5-10%
     - ____________ > 10%
   - Change in past 2 weeks
     - ____________ Increase (gain)
     - ____________ No change (stabilization)
     - ____________ Decrease (continued loss)

2. **Dietary Intake**
   - Reduction
   - Unintentional
   - Intentional
   - Overall Change
     - ____________ No Change
     - ____________ Increase or Decrease
   - Duration
     - ____________ Weeks
     - ____________ Months
   - Diet Change
     - ____________ Suboptimal solids (i.e., 75%, 50%, 25% intake)
     - ____________ Full liquid diet
     - ____________ Hypocaloric fluids
     - ____________ NPO (starvation)

3. **Gastrointestinal Symptoms** *(persisting daily for > 2 weeks)*
   - ____________ None
   - ____________ Diarrhea
   - ____________ Dysphagia/Odynaphagia
   - ____________ Nausea
   - ____________ Vomiting
   - ____________ Anorexia

4. **Functional Impairment**
   - Overall impairment
     - ____________ None
     - ____________ Mild
     - ____________ Severe
   - Duration
     - ____________ Days
     - ____________ Weeks
     - ____________ Months
   - Type
     - ____________ Ambulatory (Walking or Wheelchair)
     - ____________ Bedridden

### PHYSICAL EXAMINATION

5. **Muscle Wasting**
   - ____________ Bicep
   - ____________ Tricep
   - ____________ Quadricep
   - ____________ Deltoid
   - ____________ Temple

6. **Subcutaneous Fat Loss**
   - ____________ Tricep
   - ____________ Chest
   - ____________ Eyes
   - ____________ Perioral
   - ____________ Interosseous
   - ____________ Palmar

7. **Edema**
   - ____________ Hands
   - ____________ Sacral
   - ____________ Lower extremity

**SGA Rating**

- **Well (A)**
- **Mild/Moderate Undernutrition (B)**
- **Severe (C)**
NRI - Nutritional Ratio Index

15.9 x serum albumin (g/dL) + 41.7 x (current weight/usual weight)

= 15.9 x 4.0 + 41.7 x (68.2 / 74)

= 63.6 + 41.7 x 0.92 = 96.8
Question 1

• Is this patient malnourished?

YES, he is.

Scoring:

Severe malnutrition
Question 2

• Is a nutritional support needed?

YES, it is.

Which kind of support is required?
<table>
<thead>
<tr>
<th>Study</th>
<th>Participants</th>
<th>Intervention</th>
<th>Nutritional Status</th>
<th>Duration Before and After Surgery</th>
<th>Complications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Braga 1999</td>
<td>206 pts. GI cancer</td>
<td>IEON vs standard</td>
<td>Well nourished 76%</td>
<td>1 L for 7 days before and 7 days after surgery</td>
<td>14% vs 35% (p=0.009)</td>
</tr>
<tr>
<td>Senkal 1999</td>
<td>154 pts. GI cancer</td>
<td>IEON vs standard</td>
<td>Nutritional risk ratio similar</td>
<td>1 L for 5 days before and 10 days after surgery</td>
<td>14% vs 27% (p=0.05)</td>
</tr>
<tr>
<td>Gianotti 2002</td>
<td>305 pts. GI cancer</td>
<td>IEON vs control</td>
<td>Weight loss &lt; 10%</td>
<td>1 L for 5 days before and 5 days before and after surgery</td>
<td>Complications 13.7% (IEON) vs 15.8% (pre and postop IEEN) vs 30.4% (control) p= 0.006 vs preop and 0.02 vs periop</td>
</tr>
</tbody>
</table>
Major oncology surgery on upper GI tract (oesophagus, stomach, pancreas)

- Weekly follow up

Body weight loss > 10% or SGA grade C

- No severe malnutrition
  - IEON (Arginine, omega-3 fatty acids and Nucleotides) for at least 5 days preop

- Severe malnutrition
  - Nutritional support preop – 10 days and postop - 7 days

Mod. from Senesse P et al, 2008
WHAT WE DID - preop

- Nutritional counselling started (dietary daily recall, specific diet indicated).

- Oral integration with liquid formulas covering 40% of the estimated caloric needs (60% covered by oral feeding).

- Ten days of this nutritional support planned and operation delayed accordingly. No immuno-enhanced nutrition planned in this setting.
SURGERY

• Distal oesophagectomy and tubulization of the stomach were performed (Ivor-Lewis distal oesophagectomy).

• FNCJ according to Delany’s technique was placed at the end of the procedure.

• Central line was positioned (central venous pressure monitoring, fluids and drugs administration).
Distal oesophagectomy and Intrathoracic oesophago-gastric anastomosis (Ivor-Lewis’ procedure)
Total oesophagectomy. “High” anastomosis of tubulised stomach with cervical oesophagus. Three accesses: videoassisted thoracotomy, laparotomy and left cervical (Orringer’s technique).
Fine needle catheter jejunostomy

Complications and long-term outcome of 80 oncology patients undergoing needle catheter jejunostomy placement for early postoperative enteral feeding.


## Jejunostomy-related complications

<table>
<thead>
<tr>
<th>Author</th>
<th>patients</th>
<th>% complications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strickland - 1986</td>
<td>114</td>
<td>0.8</td>
</tr>
<tr>
<td>Smith - 1991</td>
<td>217</td>
<td>0.9</td>
</tr>
<tr>
<td>Sarr - 1999</td>
<td>500</td>
<td>1.6</td>
</tr>
<tr>
<td>Myers - 1995</td>
<td>2022</td>
<td>1.7</td>
</tr>
<tr>
<td>Eftinck - 1983</td>
<td>210</td>
<td>1.9</td>
</tr>
<tr>
<td>Page - 1979</td>
<td>199</td>
<td>2.0</td>
</tr>
<tr>
<td>Gerndt - 1994</td>
<td>523</td>
<td>2.1</td>
</tr>
<tr>
<td>Braga - 2001</td>
<td>402</td>
<td>2.7</td>
</tr>
<tr>
<td>Bruining - 1983</td>
<td>165</td>
<td>3.0</td>
</tr>
<tr>
<td>Delany - 1977</td>
<td>110</td>
<td>3.6</td>
</tr>
<tr>
<td>Weltz - 1992</td>
<td>100</td>
<td>5.0</td>
</tr>
<tr>
<td>Al-Shehri - 1990</td>
<td>133</td>
<td>10.5</td>
</tr>
<tr>
<td>Eddy - 1996</td>
<td>122</td>
<td>13.9</td>
</tr>
<tr>
<td>Smith-Choban - 1988</td>
<td>144</td>
<td>16.0</td>
</tr>
<tr>
<td>OVERALL</td>
<td>4961</td>
<td>2.9</td>
</tr>
</tbody>
</table>
PATHOLOGY REPORT

Poorly differentiated G3 adenocarcinoma of the lower esophagus extending to peri-oesophageal tissues. Nodal metastases to 14 out of 25 lymph-nodes (including coeliac nodes).

Pathology stage: pT3 pN2 M1A (lymph) stage IV A
WHAT WE DID - postop

• From day 0 immuno-enhanced nutrition was initiated via a fine needle catheter jejunostomy (10 ml/h), until a nutritional goal of 80 ml/h on postop day 5 was reached.

• Parenteral nutrients were administered to cover nutritional needs from day 0 to postop day 4.
WHAT WE DID
Adjuvant treatment and follow up

• Hospital discharge on postop day 12 after uneventful course.
• Enteral nutrition maintained via fine needle catheter jejunostomy (1000 Kcal/day, overnight), to fully cover nutritional requirements.
• Adjuvant Chemotherapy started on postop day 45. 4 cycles of ECF were planned.
CLINICAL COURSE

• After completion of adjuvant CT, patient developed painful bone metastases (dorsal-lumbar spine) and mediastinal nodes involvement.
• Radiation therapy was successfully administered to D6 and L1.
• TCF chemotherapy was initiated with partial response (less than 50% of CT scan-based reduction in diameter of lymph-nodes).
Question 3

• Is a nutritional follow up required in this case?

YES, it is.

WHY?
ESPEN guidelines:
Surgery and Transplantation

“Regular assessment of nutritional status and, if necessary, continuation of nutritional support, is advised for patients who have received nutritional support perioperatively”.

Delmi M, Lancet 1990 (bone)
Keele AM, Gut 1997 (GI)
Beattie AH, Gut 2000 (GI)
MacFie J, Nutrition 2000 (GI)
Espaulella J, Age Ageing 2000 (bone)
Smedley F, Br J Surg 2004 (CR)
Oral postoperative intake

Colorectal resection (# 30)

Inappropriate oral intake (> 1000 kcal) after POD 10: 2 pts. (6.6%)

Courtesy of M. Braga
Oral postoperative intake

Pancreato-duodenectomy (# 16)

Inappropriate oral intake (>1000 kcal) after POD 10: 12 pts. (75%)

Courtesy of M. Braga
Oral postoperative intake

Oesophago-gastrectomy (# 16)

Inappropriate oral intake (>1000 kcal) after POD 10: 12 pts. (75%)

Courtesy of M. Braga
41 pts. Clinical outcome - follow up 1

<table>
<thead>
<tr>
<th>Duration (mean, mo., r.)</th>
<th>14.2 (0.7- 41.3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deceased (%)</td>
<td>10 (24.4)</td>
</tr>
<tr>
<td>Surgical mortality + others</td>
<td>3 + 2</td>
</tr>
<tr>
<td>Cancer recurrence</td>
<td>5</td>
</tr>
<tr>
<td>NED alive</td>
<td>28 (68.2)</td>
</tr>
<tr>
<td>Alive with recurrence</td>
<td>3 (7.3)</td>
</tr>
<tr>
<td>Exclusive oral nutrition</td>
<td>27 (65.8)</td>
</tr>
<tr>
<td>(Nutritional needs met)</td>
<td></td>
</tr>
<tr>
<td>Artificial support (oral, HEN)</td>
<td>5 (12.1)</td>
</tr>
</tbody>
</table>
41 pts. Clinical outcome - follow up 2

Patients requiring a nutritional support during 3-mo. period after surgery 30/38 (79%)

HEN (FNCJ) vs oral supplements 18 vs 12 (34.4%)

HEN after 90th p.o. day 9 (21.9%)

Oral suppl. after 90th p.o. day 4 (9.7%)
HOME ENTERAL NUTRITION (HEN) IN MALNOURISHED PATIENTS AFTER MAJOR SURGERY FOR GASTROINTESTINAL MALIGNANCY.
A prospective randomised clinical trial (INT + IEO/MI)

SURGERY + FNCJ + PO-EN

R

HEN
COUNSELLING

Primary end-point: maintenance of nutritional status after hospital discharge
Secondary end-point: quality of life
ability to undergo adjuvant treatments
CLINICAL COURSE

• Nine months after esophageal surgery patient was re-admitted because of main biliary duct obstruction, causing jaundice. Hyperbilirubinemia (27.37 mg/ml).

• A fluorangiography-guided intrabiliary stent was then successfully positioned.
Conclusions - 1

• All oncology patients with a therapeutic option of surgery w/w-out adjuvant/neoadj. treatment should undergo a full nutritional assessment before planning any treatment. Decision-making should be accordingly modulated.

• Malnourished patients should receive a nutritional support before surgery, in agreement with multidisciplinary evaluation and related decisions.
Conclusions - 2

• Nutritional intervention should be maintained for all surgical period; enteral nutrition (immuno-enhancing diet) is feasible, safe and cost-effective in postop. course, and PN should be limited to particular cases.

• Nutritional follow up should be continued after hospital discharge, especially in patients who are candidate for adjuvant postsurgical treatments.
Conclusions - 3

• RCT’s are needed to better define the role of immunonutrition in severely malnourished surgical patients candidate for major surgery.

• Ongoing trials will clarify the role of prolonged home enteral nutrition support in patients who underwent major GI surgery and candidate for adjuvant treatments (CT and/or RT).

• Prolonged Home Enteral Nutrition via jejunostomy is reliable and safe in this clinical setting.
Thank you for your attention

Roberto Biffi, MD - Director
Dept. of Abdomino-pelvic Surgery
European Institute of Oncology
Milano, Italy

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