Case discussion: oesophagectomy

H. van Veer (BE)
Esophageal cancer: an ongoing quest for nutrition

ESPEN case presentation

H. Van Veer, MD
Department of thoracic surgery
Disclosure for **Hans Van Veer**

In compliance with COI policy, ESPEN requires the following disclosures to the session audience:

<table>
<thead>
<tr>
<th>Category</th>
<th>No relevant conflicts of interest to declare</th>
</tr>
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<tbody>
<tr>
<td>Shareholder</td>
<td></td>
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<tr>
<td>Grant / Research Support</td>
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<td>Consultant</td>
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<td>Employee</td>
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<td>Paid Instructor</td>
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<td>Speaker bureau</td>
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<td>Other</td>
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</table>

Presentation includes discussion of the off-label use of a medical device: V.A.C. (KCI ®)
• ♂, 55 y
• 160 cm, 47.4 kg; BMI 18.52 kg/m²

• Past medical history:
  – Ethanol abuse – Emergency Psy Unit admission
  – Conisation
  – Appendectomy

• Familial history:
  – Father † 1999 gastric cancer
  – Mother † 2009 malignant pleural mesothelioma
  – Son 1999 † RTA
Patient presentation (2)

- No allergies

- Medication:
  - disulfiram 400mg (Antabuse®) od
  - venlafaxine HCl 75mg (Efexor®) od
  - trazodon 100mg (Trazolan®) od
  - omeprazole 40mg od
Disease history (1)

- 5/2013: vague mid-thoracic pain; mild intermittent dysphagia; weight loss +/- 4kg
- squamous cell carcinoma mid-esophagus (28cm from the incisors)
Disease history (1)

- 5/2013: vague mid-thoracic pain; mild intermittent dysphagia; weight loss +/- 4kg
- squamous cell carcinoma mid-esophagus (28cm from the incisors)

MDT: neo-adjuvant chemo-radiotherapy
Question

- Is this patient already malnourished?
  - BMI 18.5
**Patient Data at Time of Diagnosis**

- Age 55 y
- BMI 18.52 kg/m²
- WL +/- 4 kg before diagnosis

**Fact box:** Two alternative ways to diagnose malnutrition. Before diagnosis of malnutrition is considered it is mandatory to fulfil criteria for being “at risk” of malnutrition by any validated risk screening tool.

**Alternative 1:**
- BMI <18.5 kg/m²

**Alternative 2:**
- Weight loss (unintentional) > 10% indefinite of time, or >5% over the last 3 months combined with either
- BMI <20 kg/m² if <70 years of age, or <22 kg/m² if >70 years of age or
- FFM1 <15 and 17 kg/m² in women and men, respectively.
Questions

• Which (specific) laboratory data as a part of the nutritional assessment?
  – Albumin? Transthyretin?
  – Vitamins?
  – Oligo-elements?

• Need for specific anthropometric measurements?
Neo-adjuvant protocol

Case presentation - Esophageal Cancer

Radiotherapy
45Gy in
1.8Gy * 25fct

Chemotherapy
Cis 50mg/m²
5-FU 400mg/m²

Chemotherapy
Cis 80mg/m²
5-FU 800mg/m²

Restaging
OGD, EUS, PETCT

Surgery
Disease history (1)

• **Problems during neo-adjuvant therapy**
  – Nausea, esophageal monoliasis and stomatitis after course 1
  – Intolerance for RT; skipped last 3 RT sessions
  – Skin toxicity
  – Body weight ↓ - 6kg since start chemotherapy
  – Radio-oesophagitis → Swallow disorders, odynophagia and vomiting → admission for **12 days of TPN 7gN/24h**
Questions

• Could the side-effects of the chemotherapy be more pronounced in this patient?
• Nutrition status and effect on clinical outcomes?
Fig. 3. Box plot showing average difference in skeletal muscle surface area (cm²) between patients with and without toxicity.
Postoperative outcome after oesophagectomy for cancer: Nutritional status is the missing ring in the current prognostic scores

B. Filip a,b,c, M. Scarpa b,c,e, F. Cavallin b, M. Cagol b, R. Alfieri b, L. Saadeh b, E. Ancona b, C. Castoro b

a Department of Surgery, University of Medicine and Pharmacy, Iasi, Romania
b Surgical Oncology Unit, Veneto Institute of Oncology (IOV-IRCCS), Padua, Italy

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Abstract

Background: Several prognostic scores were designed in order to estimate the risk of postoperative adverse events. None of them includes a component directly associated to the nutritional status. The aims of the study were the evaluation of performance of risk-adjusted models for early outcomes after oesophagectomy and to develop a score for severe complication prediction with special consideration regarding nutritional status.

Methods: A comparison of POSSUM and Charlson score and their derivatives, ASA, Lagarde score and nutritional index (PNI) was performed on 167 patients undergoing oesophagectomy for cancer. A logistic regression model was also estimated to obtain a new prognostic score for severe morbidity prediction.

Results: Overall morbidity was 35.3% (59 cases), severe complications (grade III–V of Clavien–Dindo classification) occurred in 20 cases. Discrimination was poor for all the scores. Multivariable analysis identified pulse, connective tissue disease, PNI and potassium as independent predictors of severe morbidity. This model showed good discrimination and calibration. Internal validation using standard bootstrapping techniques confirmed the good performance.

Conclusions: Nutrition could be an independent risk factor for major complications and a nutritional status coefficient could be included in current prognostic scores to improve risk estimation of major postoperative complications after oesophagectomy for cancer.

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Questions

• What about the nutritional care plan and timing in the neo-adjuvant phase?
  – Dietetic intervention and follow-up?
  – Tube-feeding (HEN?) before/during chemo?
    • PEG?
    • Laparoscopic (preoperative) jejunostomy?
  – TPN (HPN?) before/during neoadjuvant chemotherapy?
Problems during neo-adjuvant therapy
- Nausea, esophageal monoliasis and stomatitis after course 1
- Intolerance for RT; skipped last 3 RT sessions
- Skin toxicity
- Body weight ↓ - 6kg since start chemotherapy
- Radio-esophagitis → Swallow disorders, odynophagia and vomiting → admission for 12 days of TPN 7gN/24h
Questions

• What about the intrahospital TPN-regimen?
• How long?
• (H)PN until surgery?
• Place/timing for (oral) immunonutrition?
• Minimal invasive esophagectomy in prone position

• Thoracoscopic mobilisation
• Laparoscopic gastrolysis & tubulisation
• Neck anastomosis
Question

• Indication for a needle jejunostomy for early EN and later HEN?
Impact of home enteral nutrition in malnourished patients with upper gastrointestinal cancer: A multicentre randomised clinical trial

Patients and methods: Patients with upper GI cancer and candidate to major surgery were included in the protocol when the nutritional risk screening (NRS 2002) score was ≥3. All patients were supported with enteral nutrition through a jejunostomy after surgery and randomly assigned to continue enteral nutrition or receiving nutritional counselling after discharge. Nutritional and performance status, quality of life (QoL) and tolerance to cancer treatment have been evaluated at 2 and 6 months after discharge.

Results: Seventy-nine patients were randomised; 38 continued enteral nutrition at home and 41 patients received nutritional counselling only. After 2 months, patients on HEN maintained their mean body weight, while patients in the nutritional counselling group showed a weight loss of 3.6 kg. Patients supported on HEN had a higher chance to complete chemotherapy as planned (48% versus 34%). QoL was not worsened by HEN. No complications were reported.
Postoperative course

- Respiratory insufficiency at POD 5 → ICU 5 days
- Parenteral nutritional support
- Further uneventful recovery
- Gastroparesis
- Discharge at POD 21 on oral nutrition and on gastroprokinetics
  - domperidone
  - erythromycin
Questions

• When and how transition to oral fluids/feeding after surgery?
  – Consistency? (liquid-soft-solid)
  – Frequency of the meals?
  – Avoiding foods or beverages?
• Problem of gastroparesis
  – Domperidone/Erythromycine?
    • Dose? Duration?
    • Long-term effects?
    • Side-effects?
• Reflux-problem?
Bilateral vagotomy

- Gastroparesis → delayed gastric emptying
- Pyloric stenosis → delayed gastric emptying
- Disturbance upper GI pacemaker
- Dumping syndrome (or -like symptoms)

September 11, 2017

Case presentation - Esophageal Cancer
• **Dumping syndrome**
  – Symptoms?
  – How to reduce with the diet?
Evolution postop

• 6 wks: 39kg
• 3mo:
  – 43kg
  – Dumping like symptoms; investigations negative
  – Pyloric dilation
• 4 mo:
  – 41kg
  – Fatigue, lack of energy
  – Admission for parenteral nutrition & pyloric dilation
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Case presentation - Esophageal Cancer

02-05-2013 diagnosis
24-05-2013 start CT
01-07-2013 start RT
07-10-2013 Oesophagectomy
Evolution postop (2)

- 6 months:
  - Ongoing cramps; further weight decline to 39kg
  - 4/2014: explorative laparoscopy
    - Reduction of internal small bowel herniation through mesocolon
    - Feeding jejunostomy @ 1000 kCal/d support + (limited) oral intake

- 7 months: weight gain +3kg

- 9 months: weight stagnation @ 42kg
  - R/ increase of J-feeds to 1600 kCal/d + (limited) oral intake
  - R/ start of mirtazapine
Evolution postop (3)

Statlock + suturewing

Close to entry
Questions

• Needle jejunostomy or lager (Fr 14) tube?
• Nocturnal tube feeding (1000 Kcal)?
• Mirtazapine?
  – Effect? EB? Dose?
Presence and Persistence of Nutrition-Related Symptoms During the First Year Following Esophagectomy with Gastric Tube Reconstruction in Clinically Disease-Free Patients

E. B. Haverkort · J. M. Binnekade · O. R. C. Busch · M. I. van Berge Henegouwen · R. J. de Haan · D. J. Gouma

DOI 10.1007/s00268-010-0786-8

Table 3 Percentage of patients who experienced the five most frequent nutrition-related complaints during the one-year follow-up

<table>
<thead>
<tr>
<th>Complaint</th>
<th>1 week (n = 80)</th>
<th>3 months (n = 76)</th>
<th>6 months (n = 69)</th>
<th>12 months (n = 59)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Early satiety</td>
<td>71 (89)</td>
<td>66 (87)</td>
<td>60 (87)</td>
<td>53 (90)</td>
</tr>
<tr>
<td>Postprandial dumping syndrome</td>
<td>59 (74)</td>
<td>59 (78)</td>
<td>54 (78)</td>
<td>44 (75)</td>
</tr>
<tr>
<td>Inhibited passage due to high viscosity</td>
<td>42 (53)</td>
<td>48 (63)</td>
<td>41 (59)</td>
<td>37 (63)</td>
</tr>
<tr>
<td>Reflux of food/fluid</td>
<td>48 (60)</td>
<td>41 (54)</td>
<td>45 (65)</td>
<td>36 (61)</td>
</tr>
<tr>
<td>Absence of hunger</td>
<td>61 (76)</td>
<td>43 (57)</td>
<td>39 (57)</td>
<td>30 (51)</td>
</tr>
</tbody>
</table>

^a All values are expressed as n (%)
Prospective Study of Malabsorption and Malnutrition After Esophageal and Gastric Cancer Surgery

Helen M. Heneghan, MD, PhD, Alexandra Zaborowski, MD, Michelle Fanning, BSc, Aisling McHugh, BSc, Suzanne Doyle, PhD, Jenny Moore, RN, Nayarasamy Ravi, MD, and John V. Reynolds, MD

FIGURE 1. The severity of pancreatic insufficiency (mild, moderate, severe), as defined by fecal elastase levels preoperatively, at 6 months and at 18 to 24 months postoperatively.

TABLE 3. Changes in Nutritional Parameters and Micronutrients Postoperatively

<table>
<thead>
<tr>
<th></th>
<th>Preoperatively</th>
<th>1 mo Postoperatively</th>
<th>6 mo Postoperatively</th>
<th>18–24 mo Postoperatively</th>
<th>P*</th>
</tr>
</thead>
<tbody>
<tr>
<td>Albumin, g/dL</td>
<td>42.8 ± 2.8</td>
<td>36.8 ± 5.7</td>
<td>41.1 ± 5.9</td>
<td>43.1 ± 3.9</td>
<td>0.965</td>
</tr>
<tr>
<td>Hemoglobin, g/dL</td>
<td>12.8 ± 1.9</td>
<td>11.3 ± 1.7</td>
<td>12.2 ± 1.3</td>
<td>12.9 ± 1.5</td>
<td>0.792</td>
</tr>
<tr>
<td>Lymphocyte count</td>
<td>1.6 ± 1.2</td>
<td>1.5 ± 0.7</td>
<td>1.7 ± 1.1</td>
<td>1.7 ± 1.1</td>
<td>0.417</td>
</tr>
<tr>
<td>Ferritin, µg/L</td>
<td>105.7 ± 109</td>
<td>137.0 ± 233</td>
<td>76.6 ± 110</td>
<td>92.6 ± 183</td>
<td>0.617</td>
</tr>
<tr>
<td>Folate (red cell)</td>
<td>526 ± 395</td>
<td>582 ± 160</td>
<td>526 ± 158</td>
<td>513 ± 157</td>
<td>0.867</td>
</tr>
<tr>
<td>Vitamin B12, ng/L</td>
<td>491 ± 365</td>
<td>407 ± 149</td>
<td>527 ± 519</td>
<td>502 ± 388</td>
<td>0.989</td>
</tr>
<tr>
<td>Vitamin A, µmol/L</td>
<td>1.7 ± 0.6</td>
<td>1.6 ± 0.4</td>
<td>1.5 ± 0.6</td>
<td>1.2 ± 0.4</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Vitamin D, nmol/L</td>
<td>49.3 ± 36.9</td>
<td>41.7 ± 25.1</td>
<td>53.3 ± 26.7</td>
<td>58.4 ± 31.3</td>
<td>0.481</td>
</tr>
<tr>
<td>Vitamin E, µmol/L</td>
<td>27.6 ± 7.0</td>
<td>23.8 ± 6.3</td>
<td>23.1 ± 8.5</td>
<td>20.0 ± 7.1</td>
<td>0.001</td>
</tr>
<tr>
<td>Visceral fat mass, cm²</td>
<td>175.1 ± 95.6</td>
<td>–</td>
<td>–</td>
<td>83.7 ± 71.0</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Subcutaneous fat mass, cm²</td>
<td>173.8 ± 88.8</td>
<td>–</td>
<td>–</td>
<td>109.5 ± 95.7</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Total body fat-free mass, cm²</td>
<td>54.5 ± 11.3</td>
<td>–</td>
<td>–</td>
<td>49.4 ± 10.5</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Skeletal muscle index, cm²/m²</td>
<td>31.9 ± 6.1</td>
<td>–</td>
<td>–</td>
<td>29.0 ± 5.7</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

*Comparing preoperative to 18- to 24-month postoperative time periods.
Large vs. small bore jejunostomy**

Nelaton (n=236)

- 71% onverwikkeld
- 29% dislocatie

- 10% fractuur/beschadiging/lekkage vanuit katheter
- 1% lekkage rond katheter
- 1% verstopping
- 1% andere

Vygon (n=57) (12/2013 and onwards)

- 74% onverwikkeld
- 26% dislocatie

- 4% intentionele dislocatie
- 4% fractuur/beschadiging/lekkage vanuit katheter
- 4% verstopping
- 14% andere

O.D. 14F
I.D. 9 F

p=0.69

O.D. 9,8F
I.D. 6 F

**unpublished data
Dpt. of Thoracic Surgery, University Hospitals Leuven
Evolution postop (3)

2014

2015

2016

Placement of FJT

replacement of FJT

September 11, 2017

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37
Evolution postop (4): weight after JT

Weight Evolution with start EN

- 11-04-2014 laparoscopic internal herniation + 1st jejunostomy
- 16-07-2014 jejunostomy
- 12-09 jejunostomy
- 28-11 jejunostomy
- 05-03-2015 jejunostomy
- 18-05 jejunostomy
- 17-06 jejunostomy
- 24-10 jejunostomy

Lapsc intern Hernia + 1st
Hernia + 1st jejunostomy

1000kCal + oral
1600kCal + oral
New event 02-2016

• Presentation at ER
  – Cough
  – Dyspnea
  – Rhonchi
  – CRP 420mg/dl
  – Creatinin 1,22
  – Ox to 64%

• Pneumonia RLL

• Admission to ICU
• Further investigations

Tracheo-esophageal fistula at 18cm, just proximal to the anastomosis
New event 02-2016: TOF

- R/ Silicone trachea stent
- R/ NPO + JTF increase @ 2.400kCal
New event 02-2016: TOF

- Evaluation 8 & 12 weeks post-stent insertion

Persisting TOF
New event 02-2016: TOF

• 06-2016: home-made Esosponge® application intragastric → revitalizing of fistula edges

After 6x: no progress
Failure of conservative R/

- 08-2016: transtracheal resection of fistula with SCM flap
08-2016: Closure SCM flap
• Uneventfull recovery
• Resume oral intake D5
• Continuation of JTF @ 1600 kCal

• 3 weeks postop:
  – Weight gain to 50 kg
  – Full oral intake
  – Removal of JT on pt request
• 2 months postop: - 3 kg (47,2kg)
• Ongoing cough; worries about recurrent TOF
  – No TOF demonstrated

• Pain, worries, weight loss
  → ethanol use…
  → Further weight loss
  → Emergency psychiatry admission…
• 4 months postop: another - 3 kg (44,1kg)
• Iatrogenic Hyperthyroidism
  – R/ correction

• Another 3 weeks later: 42 kg…
  – ➔ new JT 01/2017 and restart JTF support @ 1000 kCal

• 6 weeks after JTF: +2,5kg…
The patient’s quest…

Weight Evolution

- 02-05-2013 diagnosis
- 24-05-2013 start CT
- 01-07-2013 start RT
- 07-10-2013 OP
- 11-04-2014 lapsc intern hern + 1st jeju
- 16-07-2014 jejunostomy
- 12-09 jejunostomy
- 28-11 jejunostomy
- 05-03-2015 jejunostomy
- 18-05 jejunostomy
- 17-06 jejunostomy
- 24-10 jejunostomy
- 15-04-2016 jejunostomy
- 10-06 tem 01-07 endoVAC
- 25-08 Sx closure fistula
- 26-01-2017 NEW jejunostomy
The end…?

- 3,5 years after diagnosis, patient is cancer free

- 4 years oncological FU mark? PET CT was postponed because of RUL bronchopneumonia…

- TBC…
Conclusions

• Esophagectomy patients are or often already malnourished or at high risk at the time of diagnosis and in the postoperative follow-up.

• Attention to nutrition throughout the process of diagnosis, treatment, and postoperative care is essential for optimal care of the esophagectomy patient.