# VRAAG 2A: NUT VAN PET/CT ALS AANVULLING VAN CT EN/OF EUS

## Diagnostische studies

| Study ID | Method | Patient characteristics | Intervention(s) | Results primary outcome | Results secondary and other outcomes | Critical appraisal of study quality |
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| Han D 2012 [1] | • Prospective cohort study<br>• Funding/CoI: not reported<br>• Setting: single university centre, China<br>• Sample size: N=22<br>• Duration: 3/2008-1/2009 | • Eligibility criteria: patients with a first diagnosis of biopsy-proven SCC of the thoracic esophagus eligible for esophageal resection and extensive regional lymph node dissection (no metastasis to distant organs or definite direct tumour invasion of adjacent organs on imaging); no prior anticancer treatment, no diabetes mellitus or inflammatory lung disease; exclusion of those ineligible for surgery for medical reasons<br>• Patient characteristics:<br>○ Mean age 60y<br>○ Male: 59%<br>• Prevalence of disease: 73% patients with positive lymph nodes | Index test:<br>(1) FLT PET/CT<br>(2) FDG PET/CT<br><br>Reference standard:<br>Histopathology of resection specimen (standard hematoxylin–eosin technique and examined with light microscopy) | Detection of positive lymph nodes: FLT PET/CT<br><br>• Se 74%<br>• Sp 99%<br>• PPV 92%<br>• NPV 97% | Detection of positive lymph nodes: FDG PET/CT<br><br>• Se 83%<br>• Sp 96%<br>• PPV 74%<br>• NPV 98% | Level of evidence: B<br><br>• Moderate risk of bias<br>• Consecutive inclusion<br>• No blinding<br>• Stage M1a carcinoma (i.e. metastasis to cervical lymph nodes in patients with upper esophageal carcinoma or to celiac lymph nodes in patients with lower esophageal carcinoma) was not considered to be a contraindication to surgery<br>• Only per-lesion analysis: 424 dissected lymph nodes |
| Hu Q 2009 [2] | • Prospective cohort study<br>• Funding/CoI: not reported<br>• Setting: single centre, China<br>• Sample size: N=34<br>• Duration: 11/2005-10/2007 | • Eligibility criteria: patients with a diagnosis of biopsy-proven SCC of the thoracic esophagus; no distant metastasis or local tumour invasion; no candidates treated with chemotherapy and radiotherapy<br>• Patient characteristics:<br>○ Mean age 61.7y<br>○ Male: 68%<br>• Prevalence of disease: 82% patients with positive lymph nodes | Index test:<br>FDG-PET<br><br>Reference standard:<br>Histopathology of resection specimen (not further specified) | Detection of positive lymph nodes: early image (SUV 2.5)<br><br>• Se 76%<br>• Sp 85%<br>• PPV 56%<br>• NPV 93% | Detection of positive lymph nodes: RI = 10<br><br>• Se 89%<br>• Sp 92%<br>• PPV 73%<br>• NPV 97% | Level of evidence: B<br><br>• Moderate risk of bias<br>• Consecutive inclusion<br>• No blinding: physicians were aware of CT or MRI results, no information on blinded pathology review<br>• Only per-lesion analysis: 354 dissected lymph nodes |
| Noble F 2009 [3] | • Prospective cohort study<br>• Funding/CoI: supported and sponsored by the upper GI tumour panel | • Eligibility criteria: patients with newly diagnosed histologically confirmed esophageal cancer (or involving the GEJ) who | Index test:<br>FDG-PET/CT<br><br>Reference standard:<br>Biopsy or clinical | Detection of distant metastasis:<br><br>• Se 91%<br>• Sp 94% | | Level of evidence: B<br><br>• High risk of bias<br>• Potential selection bias (based on |

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| | of the South West Cancer Intelligence Service<br>• Setting: multicentre study, 12 NHS trusts, UK<br>• Sample size: N=191<br>• Duration: 11/2006-10/2007 | underwent PET/CT imaging; at the time of their PET/CT, candidates for potentially curative treatment of their tumours<br>• Patient characteristics:<br>  ○ 36-54y: 12%; 55-64y: 32%; 65-74y: 36%; 75+: 20%<br>  ○ Male: 78%<br>• Prevalence of disease: 12% patients with distant M+ | course / further imaging (not further specified) | • PPV 68%<br>• NPV 99% | | receiving of index test)<br>• Differential verification<br>• Probably no blinding |
| Okada M 2009 [4] | • Retrospective (?) cohort study<br>• Funding/CoI: not reported<br>• Setting: single university centre, Japan<br>• Sample size: N=18<br>• Duration: 4/2006-3/2007 | • Eligibility criteria: patients with esophageal cancer, not previously started therapy prior to radical surgery, sufficient reference CT imaging data<br>• Patient characteristics:<br>  ○ Mean age: 68y<br>  ○ Male: 78%<br>• Prevalence of disease: 72% patients with positive lymph nodes | Index test:<br>(1) FDG PET/CT<br>(2) CE-CT<br><br>Reference standard:<br>Histopathology of resection specimen (not further specified) | Detection of positive lymph nodes, PET/CT (positive = FDG-uptake above the background):<br><br>• Se 60%<br>• Sp 99%<br>• PPV 94%<br>• NPV 95%<br><br>No patient with distant metastasis. One patient with false-positive uptake in left adrenal gland. | Detection of positive lymph nodes, CE-CT (protocol A: positive is >7 mm for all regional LNs):<br><br>• Se 60%<br>• Sp 95%<br>• PPV 63%<br>• NPV 95%<br><br>Detection of positive lymph nodes, CE-CT (protocol B: positive is >10 mm for paratracheal LNs and >7 mm for all other regional LNs):<br><br>• Se 56%<br>• Sp 97%<br>• PPV 74%<br>• NPV 94% | Level of evidence: B<br><br>• High risk of bias<br>• Out of 180 consecutive patients, only 18 patients were included; inclusion criteria not described in detail, but receiving of index test seems to be amongst them)<br>• Blinding of imaging review, but unclear for pathology review<br>• Only per-lesion analysis |
| Yu W 2011 [5] | • Prospective cohort study<br>• Funding/CoI: no CoI, funding not reported<br>• Setting: single university centre, China<br>• Sample size: N=16<br>• Duration: 5/2007-1/2008 | • Eligibility criteria: patients with histologically proven thoracic esophageal SCC and KPS score of >80; no previous treatment with radiotherapy or chemotherapy, no evidence of visceral metastatic disease in their routine pre-treatment evaluations; patients with diabetes mellitus and those ineligible for surgery for medical reasons were excluded, as were patients who refused | Index test:<br>(1) FDG PET/CT<br>(2) CE-CT<br><br>Reference standard:<br>Histopathology of resection specimen (standard hematoxylin–eosin technique and examined with light microscopy) | Detection of positive lymph nodes, PET/CT (using SUV cut-off of 2.36):<br><br>• Se 76%<br>• Sp 96%<br>• PPV 76%<br>• NPV 96% | Detection of positive lymph nodes, CE-CT:<br><br>• Se 33%<br>• Sp 94%<br>• PPV 50%<br>• NPV 89% | Level of evidence: B<br><br>• Moderate risk of bias<br>• Consecutive, prospective inclusion<br>• Blinded imaging review, unclear for pathology<br>• Only per-lesion analysis |

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| | | surgery<br>• Patient characteristics:<br>  ○ Median age: 57y<br>  ○ Male: 88%<br>• Prevalence of disease:<br>  56% patients with positive<br>  lymph nodes | | | | |

Abbreviations: 95%CI: 95% confidence interval; CE: contrast-enhanced; CoI: conflicts of interest; CT: computed tomography; FDG: fluoro-deoxy glucose; FLT: fluorothymidine; GEJ: gastro-esophageal junction; KPS: Karnofsky Performance Status; LN: lymph node; M+: metastasis; MRI: magnetic resonance imaging; NPV: negative predictive value; PET: positron-emission tomography; PPV: positive predictive value; RI: retention index; SCC: squamous cell cancer; Se: sensitivity; Sp: specificity; SUV: standardized uptake value.

References

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