toxicity was seen between patients with SCN involvement and those without,irrespective of the location of the primary tumor.

**Conclusion:** In esophageal cancer treated with definitive chemoradiation, number of affected lymph nodes is an important prognostic factor, while involvement of a supraclavicular lymph node is not. The supraclavicular lymph node should beconsidered a regional lymph node and treated with curative intend if the total number of involved lymph nodes is limited, irrespective of the site of the primary tumor.

**PO-0707**

**The impact of dose on survival in adjuvant chemoradiation pancreatic cancer**

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**Purpose or Objective:** To define the role of radiation dose on overall survival (OS) in pancreatic adenocarcinoma (PAC) patients treated with adjuvant chemoradiotherapy (CRT).

**Material and Methods:** A total of 518 patients from different centers, completely resected with macroscopically negative margins (R0-1) for PAC (T1-3; N0-1; M0) and treated with adjuvant CRT, were retrospectively reviewed. Patients with metastatic or unresectable disease at surgery, macroscopic residual disease (R2), treated with intraoperative radiotherapy (IORT), dead within 60 days of surgery and without a histological diagnosis of ductal carcinoma were excluded. Only 142 patients received adjuvant chemotherapy.

**Results:** With 35 months of median follow-up, median OS was 23.0 months after adjuvant CRT with dose ≥ 45 Gy versus 13.0 months with dose < 45 Gy (p < 0.001); 5-year OS was 21.9% versus 3.8%, respectively. Among prognostic factors, higher Ca19-9 levels (>90; p<0.001), higher tumor grade (G3-4, p = 0.017), R1 resection (p = 0.003), higher pT stage (p = 0.002) and positive nodes (p < 0.001) can be identified as negative. Multivariate analysis (HR: 0.52, 0.34-0.77; p = 0.001) proved the positive impact of higher dose.

**Conclusion:** A significant impact of CRT dose on OS was pointed out by the results of this analysis. The randomized trials on adjuvant CRT in PAC, in which a relatively low-dose of radiation (40 Gy, split course) was used, may have had conflicting results due to this bias.

**PO-0708**

**Advanced age is no contraindication for chemoradiotherapy with curative intent in oesophageal cancer**

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**Purpose or Objective:** To compare long-term outcomes of chemoradiotherapy between young and elderly (≥70 years) oesophageal cancer patients treated with curative intent.

**Material and Methods:** Oesophageal cancer patients treated between 1998 and 2013 in our institute with neoadjuvant (nCRT) or definitive (dCRT) chemoradiotherapy were retrospectively analysed. nCRT consisted of 36-50Gy with concurrent 5-fluorouracil/cisplatin or 41.4Gy with concurrent carboplatin/paclitaxel. dCRT consisted of 50Gy with concurrent fluorouracil/cisplatin or 50.4Gy with concurrent carboplatin/paclitaxel. Overall survival (OS), disease-free survival (DFS) and locoregional control (LRC) were compared between older (>70 years) and younger patients (< 70 years). Cox models were used to obtain adjusted hazard ratios (HR) and 95% confidence intervals (CI).

**Results:** The cohort consisted of 253 patients with a median follow up of 4.3 years. A group of 182 patients (72%) was < 70 years (median age 60). The remaining 71 patients were >70 years (median age 75). The two age groups (younger vs. older) differed significantly regarding smoking (59% vs. 31%; $p$<0.001), alcohol abuse (64% vs. 46%; $p$=0.007), Charlson comorbidity index (median 0 vs. 1; $p$=0.001) and weight loss prior to CRT (median 4 vs. 3 kgs; $p$=0.038). Most patients had stage IIA-IIIA disease (82%). Distribution of tumour stages was similar in the two age groups (stage IIA: 27% vs. 24%, stage IIB: 4% vs. 4%, stage IIIA: 51% vs. 55%).
Initial treatment was nCRT with the intent to proceed to surgery in 169 patients, whereas 84 patients were planned for dCRT. Although surgery was the intent, 15% of the younger nCRT patients were not operated versus 35% of the older nCRT patients ($p$=0.01). Reasons to withhold surgery in the younger versus older patients were tumour progression (10% vs. 14%), toxicity (2% vs. 11%) or patient's own choice (3% vs. 11%), $p$=0.01. At baseline, there was a significant difference in the distribution of the final treatment given (nCRT + surgery, dCRT or nCRT without surgery; $p$<0.001).
For the entire study population, OS at 3-years was 42%. In the multivariable analysis, no difference was found in OS between the two age groups (old vs. young; HR 0.72, 95% CI 0.49–1.07, $p$=0.10). In the older age group, DFS (HR 0.66, 95% CI 0.45–0.98, $p$=0.04) and LRC (HR 0.43, 95% CI 0.23–0.82, $p$=0.01) were significantly better than in the younger age group.

**Conclusion:** Elderly oesophageal cancer patients (>70 years) treated with neoadjuvant chemoradiotherapy followed by surgery or definitive chemoradiotherapy had long-term outcomes which did not differ from the outcomes of their younger counterparts. For oesophageal cancer patients, advanced age alone should not be a contraindication for chemoradiotherapy as a part of treatment with curative intent.

**PO-0709**

**Interobserver variation of CT and FDG-PET based GTV for oesophageal cancer: a Dutch nationwide study**

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**Purpose or Objective:** Interobserver variation in target definition is a major contributor to geometric uncertainty in radiotherapy and consistent GTV delineation is crucial in dose escalation studies for oesophageal cancer. The routine use of FDG-PET for target delineation in oesophageal cancer patients treated with chemoradiation is debated in the literature. The aims of this study were to evaluate the interobserver variation of GTV delineation in The Netherlands and the impact of adding FDG-PET to CT images on interobserver variability in patients with oesophageal carcinoma.

**Material and Methods:** Six cases were included from a prospective database of oesophageal carcinoma patients. All cases underwent a planning FDG-PET/CT scan in treatment position. Twenty upper gastro-intestinal dedicated radiation oncologists from 14 institutes in The Netherlands independently delineated the GTV first on CT, using additional clinical and diagnostic information. Secondly, they adjusted this GTV after CT and FDG-PET images were fused. As general metrics for interobserver variability, volumes and generalized conformity indices were calculated. For visual comparison of interobserver variation observer count maps were generated for each case, i.e. maps of voxels showing the number of enclosing observer delineations. To quantify the interobserver variation at the cranial and caudal border, the distance along the z-axis that contains 5-95% of the observers was used.

**Results:** Significant differences in delineated GTV volumes were observed in 4 out of 6 cases after addition of FDG-PET to CT (Table 1). In 3 cases there was a significant volume reduction, whereas in one case a significant volume increase was found by PET, caused by unsuspected continuation of the tumour in the stomach. Generalized conformity indices were comparable for CT and FDG-PET/CT (Table 1). Count maps revealed that interobserver variation was mainly located at the cranial and caudal border (Figure 1A). The median observer variation was 26 mm (range 6-36 mm) at the cranial border and 18 mm (range 3-30 mm) at the caudal border (Figure 1B). Even after addition of PET interobserver variation remained more than 20 mm in 4 out of 6 cases (Figure 1B). In 2 cases a reduced interobserver variation was seen with PET/CT at the cranial border and in another 2 cases only at the caudal border. An increased variation was seen with PET/CT compared with CT at the caudal border for the case with the unsuspected FDG uptake in the stomach.

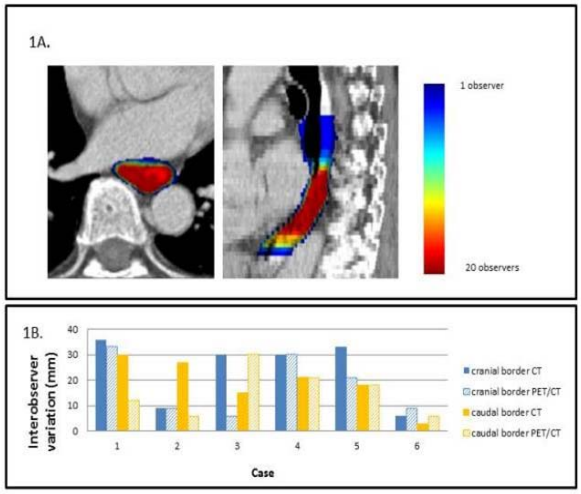


**Figure 1A.** Observer variation of CT based delineations of 20 observers in case 5, displayed as observer count map overlay on CT. Axial and sagittal view. **1B.** Interobserver variation at the cranial and caudal border of CT based and of FDG-PET/CT based delineations. Interobserver variation was defined as the distance along the z-axis that contains 5-95 % of the observers.

Table 1. Comparison of CT and PET/CT based delineations in 6 oesophageal cancer patients

| | Mean volume in cm³ (SD) | | CIgen ¹ | |
|---|---|---|---|---|
| Case | CT | PET/CT | CT | PET/CT |
| 1 | 51.0 (12.3) | 53.1 (11.4) | 0.67 | 0.69 |
| 2 | 54.2 (9.4) | 49.2 (8.7)* | 0.76 | 0.77 |
| 3 | 65.8 (7.6) | 76.7 (12.1)* | 0.66 | 0.69 |
| 4 | 52.0 (13.6) | 45.0 (12.7)* | 0.62 | 0.65 |
| 5 | 28.3 (7.5) | 26.8 (7.5) | 0.58 | 0.56 |
| 6 | 13.3 (2.3) | 12.4 (2.0)* | 0.75 | 0.76 |

* $p < 0.05$, pairwise t-test

¹ CIgen = generalized conformity index [Kouwenhoven et al. 2009]

**Conclusion:** This nationwide Dutch contouring study in oesophageal cancer demonstrated that in daily clinical practice considerable GTV delineation variation is present, with variations up to 36 and 30 mm at the cranial and caudal border, respectively. Although FDG-PET significantly impacted the delineated volume in two-thirds of the patients, the addition of PET did not translate into an observer variation below 20 mm in 4 out of 6 cases.

**PO-0710**

**Large interobserver variation of delineated target volumes of pancreatic cancer in the Netherlands**

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