0 to 1. The median radiation dose was 50.4 cGy (range, 45 to 59.4 cGy); 51% of patients received PF while 49% received PT. Most patients had adenocarcinoma (93%) of the esophagus and were male (86%) with a median age of 65 (range, 29 to 78). Follow-up assessments were examined, and perioperative complications were categorized as composite toxicity (hospital readmission) or acute toxicities in the pulmonary, cardiac, and gastrointestinal systems.

There was no difference in overall survival in PF versus PT patients (76% vs 70%; $P = .70$). Pathologic complete response was similar in patients treated with PF and PT (24% vs 25%; $P = .91$). There were also comparable rates of locoregional recurrence (18% vs 10%; $P = .28$) and distant metastases (22% vs 18%; $P = .65$).

There were no significant differences in baseline characteristics between the 2 groups or in pulmonary, cardiac, or gastrointestinal complications. However, patients treated with PF were readmitted more often than patients treated with PT (42% vs 22%; $P = .04$).

This study showed that PT nCRT and PF nCRT have comparable effects on a variety of outcomes. The authors concluded that reduced readmission rates suggest that PT may produce less composite toxicity during nCRT of LAEC.

Radiation Method Comparison for Esophageal Carcinoma

Written by Emma Hitt Nichols, PhD

Esophageal carcinoma treatment response to intensity-modulated radiation therapy (IMRT) was not significantly different from 3-dimensional conformal radiation therapy (3DCRT). Jie Kong, MD, Department of Radiation Oncology, The Fourth Hospital of Hebei Medical University, Shijiazhuang, China, presented results from this retrospective analysis.

IMRT and 3DCRT are common radiation methods used to treat patients with esophageal cancer at Dr Kong's institution. This retrospective study examined differences in patient response and the extent of dosage to organs at risk (OAR) of these targeted radiation techniques.

Treatment response, overall survival, and dosage of OAR were assessed in 510 consecutive patients. Most patients had squamous cell esophageal carcinoma (92.8%). At the discretion of the radiation oncologist, IMRT was administered to 66 patients and 3DCRT to 444 patients. Regardless of method, patients received roughly 2 Gy per day, 5 days a week and may have received concurrent and/or subsequent chemotherapy.

There were no significant differences in any of the measured outcomes between IMRT and 3DCRT. Overall survival rates were similar (27.3% vs 23.4%), as were 1-year (72.7% vs 68.2%) and 5-year (32.3% vs 25.5%) survival rates. Although the complete response rate for patients treated with IMRT was slightly higher than 3DCRT (60.6% vs 53.2%), it was not statistically different.

The dosage of OAR in the lung and heart showed no overall differences, but there was less variation for IMRT vs 3DCRT. The median percentage of pulmonary volume receiving radiation >20 Gy for IMRT) was similar to 3DCRT (25.2 vs 24) but showed less variation (Q1–Q3 range, 22.6–26.9 for IMRT vs 18.6–27.4 for 3DCRT). The V40 for the heart was also more variable with IMRT (median 20.2; range, 5.9–28.4) compared with 3DCRT (median 17.3; range, 11.2–40.4).

Dr Kong concluded that IMRT was no more effective than 3DCRT, but further investigation of the variability of dosage of OAR may be warranted.

Invasive Mediastinal Staging Is Not Necessary for Early-Stage NSCLC Before SBRT

Written by Emma Hitt Nichols, PhD

Invasive mediastinal staging methods did not provide added outcome benefits over positron emission tomographic (PET) imaging alone in patients with non–small cell lung cancer (NSCLC). Roy Decker, MD, PhD, Yale University School of Medicine, New Haven, Connecticut, USA, presented data from this retrospective analysis.

Stereotactic body radiotherapy (SBRT) is a treatment option for patients with NSCLC who are not eligible for surgical intervention. The staging workup for patients with NSCLC receiving stereotactic SBRT requires an initial PET imaging. However, in some cases, nodal status is confirmed by mediastinoscopy or endobronchial ultrasonography. The supplementary information obtained by these invasive mediastinal procedures has not been well studied in NSCLC. This study assessed whether additional staging improved outcomes in patients with NSCLC.

A total of 286 patients with early-stage NSCLC who received either PET-only (68%) or PET-plus-invasive mediastinal staging (32%) were included in the analysis. Patients with larger tumors (>3 cm), synchronous primary lesions, and central lesions were more likely to receive PET-plus-invasive mediastinal staging. Survival distributions and hazard ratio analyses were completed in this assessment.

Overall survival (OS) for both groups was similar; median OS for PET-only patients was 26.8 months compared with 22.4 months in PET-plus-invasive mediastinal staging ($P = .28$). Both groups had similar rates of local recurrence-free survival (82.5% vs 89.6%), regional recurrence-free survival (89.5% vs 81.9%), and distant recurrence-free survival (78.2% vs 85.6%).

Neither pretreatment staging method was predictive of OS or recurrence-free survival. Regression analysis showed that staging method type, prior cancer, age, and the presence of synchronous tumors were not significant predictors of OS or recurrence-free survival ($P > .05$). However, central location (HR, 1.46) and advanced tumor stage (HR, 1.49) were factors that predicted worse OS ($P < .05$).

The authors concluded that because of the similar clinical outcomes, more invasive mediastinal staging might be unnecessary for patients with early-stage NSCLC receiving SBRT.

Table 1. Late-Phase Adverse Events in the Radiation Therapy Oncology Group 0126 Study

Toxicity: Grade	Dose Group, %		HR (95% CI)	*P* Value
	High	Low		
GI				
2+	22	16	1.40 (1.10 to 1.77)	.0063
3+	5	4	NR	.035
GU				
2+	15	10	1.70 (1.23 to 2.33)	.001
3+	3	3	NR	.14

GI, gastrointestinal; GU, genitourinary; NR, not reported.

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High-Dose RT Does Not Improve OS in Prostate Cancer

Written by Mary Mosley

A phase 3 dose escalation study of radiation therapy (RT) in patients with localized prostate cancer was terminated early and did not find an improvement in the primary outcome of overall survival (OS). The Radiation Therapy Oncology Group 0126 study, presented by Jeff Michalski, MD, Washington University School of Medicine, St Louis, Missouri, USA, found significant improvements in the rates of local control, distant metastases, and biochemical disease-free survival.

The intermediate-risk patients were randomized to a high or low dose of RT (79.2 Gy in 44 fractions, n = 748; 70.2 Gy in 39 fractions, n = 751). They were stratified by Gleason score (GS; 6 vs 7), prostate-specific antigen level (PSA; between 10 and 20 ng/mL vs < 15 ng/mL), and treatment (3D conformal radiation therapy vs intensity-modulated radiotherapy). At baseline, the median age was 71 years, and the tumor stage was T1 and T2 in 57% and 43% of each group, respectively. Most patients (83% of low dose and 85% of high dose) had a GS of 7, and most (70%) had a PSA < 10 ng/mL. Of the low- and high-dose groups, 85% and 83% had a GS 7 and a PSA < 15 ng/mL. The median follow-up was 7.0 years in all patients.

The OS was 66.7% and 65.6% in the high- and low-dose groups, respectively (HR, 0.98; 95% CI, 0.79 to 1.21; log-rank $P = .87$). Death due to prostate cancer was uncommon, at 13%, while death from other cancer was 22% and other causes, 46%, based on a blinded review. Time to prostate cancer death was similar, at 3.5% and 5.6% in the high- and low-dose groups, respectively (HR, 0.61; 95% CI, 0.33 to 1.11; Gray test, $P = .11$).

An important and significant difference was seen in biochemical failure at 10 years. Based on the ASTRO consensus definition, it was 30% and 45% in the high- and low-dose groups, respectively (HR, 0.59; 95% CI, 0.49 to 0.70; Gray test, $P < .0001$), and based on the Phoenix definition, it was 26% and 43%, respectively (HR, 0.59; 95% CI, 0.48 to 0.72; Gray test, $P < .0001$).

A significant improvement in the rates of local progression and distant metastases was seen at 10 years. With high- versus low-dose RT, the local progression rates were 4% and 8% (HR, 0.42; 95% CI, 0.24 to 0.73; Gray test, $P = .0059$), and the distant metastasis rates were 5% and 8% (HR, 0.60; 95% CI, 0.37 to 0.98; Gray test, $P = .026$). Salvage therapy was more common in the low-dose group (20.6% vs 13.5% in the high-dose group; $P = .0002$).

The rate of acute adverse events was similar in both groups. The incidence of genitourinary (GU) and gastrointestinal (GI) grade 2+ toxicity in the high- and low-dose groups was 2.4% and 2.8% ($P = .64$) and 11.1% and 12.8% ($P = .31$), respectively. The incidence of GU plus GI toxicity was 12.3% and 13.7% ($P = .42$). The rate of late-phase toxicity was higher at 10 years in the high- versus low-dose group (Table 1).

Dr Michalski stated that, compared with the other published trials of dose escalation of RT in patients