**SUPPLEMENTARY TABLES**

**Supplementary table 1:** Baseline and treatment characteristics of the patients in the

expansion cohort

|  |  |  |
| --- | --- | --- |
| **Characteristic** | **Sub-category** | **Patient number (%)** |
| Age | <70 years | 10 (58.8%) |
| ≥70 years | 7 (41.2%) |
| Gender | Male | 10 (58.8%) |
| Female | 7 (41.2%) |
| Ethnicity | Caucasian | 16 (94.1%) |
| Other  | 1 (5.9%) |
| ECOG performance status | 0-1 | 15 (88.2%) |
| 2 | 2 (11.8%) |
| Smoking status | Current | 3 (17.6%) |
| Previous | 14 (82.4%) |
| Histology | Squamous cell carcinoma | 8 (47.1%) |
| Adenocarcinoma | 9 (52.9%) |
| Disease status | De-novo  | 16 (94.1%) |
| Recurrent  | 1 (5.9%) |
| TNM stage group (7th AJCC edition (1)) | I | 1 (5.9%) |
| II | 0 (0%) |
| IIIA | 8 (47.1%) |
| IIIB | 6 (35.3%) |
| IV | 2 (11.8%) |
| Treatment | Radiotherapy alone | 3 (17.6%) |
| Sequential chemoradiation  | 13 (76.5%) |
| Concurrent chemoradiation  | 1 (5.9%) |
| Radiotherapy planning | 3D CT | 3 (17.6%) |
| 4D CT | 14 (82.4%) |
| Radiotherapy dose and fractionation | 55 Gy in 20 fractions | 14 (82.4%) |
| 60 Gy in 30 fractions | 2 (11.8%) |
| 66 Gy in 33 fractions | 1 (5.9%) |

**Supplementary table 2:** Summary of patient safety, tolerability and MRI scan data quality assurance

|  |  |
| --- | --- |
| **Category** | **Details** |
| Safety | Adverse events not seen in any patient |
| Tolerability | * Examination terminated due to request for comfort break (*n*=1)
* Participant withdrawn from study after first scan (which was well tolerated) due to unrelated chemotherapy toxicity (*n*=1)
 |
| Data quality assurance\* | 40/44 acquired and completed OE-MRI scans passed all quality assurance checks and were analysed:* OE-MRI wrap artefact (*n*=1)
* OE-MRI data were loss due to operator error (*n*=3)
* OE-MRI could not be registered to DCE-MRI with sufficient accuracy to permit combined OE-MRI/ DCE-MRI analysis (*n*=2 tumors)
 |

\*: These numbers pertain to scans, not patients (in contrast to supplementary figure 4)

**Supplementary table 3:** ICC, CoV (with 95% CI) and Bland-Altman analysis results for the imaging parameters. Further details on methods for quantifying imaging parameters can be found in methods section

|  |  |  |  |
| --- | --- | --- | --- |
| **Parameter** | **ICC** | **CoV (%)** | **Bland-Altman** |
| **Single measure** | **95% CI** | **Mean value** | **95% CI** | **Bias** | **Lower LoA** | **Lower LoA** |
| *Perfused Oxy-R* volume (cm3) | 0.961 | 0.858-0.990 | 25.880 | 8.020-43.750 | -1.660 | -10.500 | 7.220 |
| *ΔR1* (s-1) | 0.771 | 0.400-0.924 | 19.700 | 10.940-28.470 | 0.001 | -0.012 | 0.013 |
| Median *IAUC*60 (s mmol/l) | 0.881 | 0.707-0.955 | 16.200 | 8.250-24.140 | -0.801 | -5.370 | 3.770 |

**Reference**

1. Edge S. American Joint Committee on Cancer, American Cancer Society. AJCC cancer staging handbook: from the AJCC cancer staging manual. Springer, New York **2010**;19:718.