

111 Quality of life after treatment for brain metastases: interim data from the MRC QUARTZ clinical trial. Part two, symptoms, quality of life and data completion

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Background: QUARTZ looks to answer a longstanding clinical question, namely what role does whole brain radiotherapy (WBRT) play in the treatment of patients with inoperable brain metastases from non-small cell lung cancer (NSCLC). In QUARTZ, all patients are treated with steroids and optimal supportive care (OSC), and are randomised to determine whether they also receive WBRT. Despite widespread support, recruitment was lower than anticipated and the trial was under threat of closure. It was felt that a change of approach was required to improve trial recruitment, and so the decision was made to release some early trial data.

Methods: Data from the first 151 patients entered into QUARTZ were analysed and presented to participating centres, in order to provide investigators with further information upon which to base trial decisions and discussions.

Results: Of the first 151 patients randomised, 78% reported moderate or severe symptoms at baseline, most commonly tiredness (47%). 70% reported problems with mobility, 73% problems with performing their usual activities, and 50% problems with pain and/or discomfort.

80% of patients received the full course of WBRT, although 11 (15%) patients experienced rapid progression and did not begin WBRT. Treatment with WBRT did not appear to have an obvious effect on quality of life. The average daily dose of dexamethasone throughout the study was 6mg in both arms.

Despite the poor prognosis of patients with brain metastases, data completion is excellent, with the majority of patients able to fully complete telephone assessments throughout their time on the study.

Conclusions: Patients entering QUARTZ report a wide range of symptoms at baseline, and have various impairments to their quality of life. Further data are required to fully explore the effect on quality of life of treatment with WBRT, and QUARTZ remains a vital clinical trial.

112 Set-up corrections for lung stereotactic body radiotherapy (SBRT) patients determined by online cone beam CT image guidance

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Introduction: Stereotactic body radiotherapy (SBRT) has become an internationally accepted treatment option for patients with medically inoperable peripherally located early stage non small cell lung cancers. Since relatively few, high dose, ablative fractions are delivered to a small target volume the consequences of a geometric miss are potentially very significant.

Methods: Set-up data was collected from the Elekta Synergy cone beam CT system for seventeen patients immobilised using the Bodyfix system. Images were acquired on the linac at initial patient set-up, following any position correction and post treatment, and matched to the localisation CT scan using the XVI software.

Results: In total, 71 fractions were analysed for set-up errors. The mean vector error at initial set-up was 5.2–2.8mm which was significantly reduced to 1.3–0.7mm following image guided correction. Following treatment the corresponding values were 2.0–1.3mm. The use of the Bodyfix abdominal compression plate (4 cases), to reduce the range of tumour excursion during

respiration, produced mean longitudinal set-up corrections of –4.4–4.5 mm compared to –0.8–2.5 mm without.

Conclusion: Patients treated with lung SBRT using a Bodyfix vacuum bag immobilisation technique are well immobilised, with intra fraction movement small after initial set-up correction using Cone beam CT image guidance. Our data suggests that lung SBRT should not be delivered without image guidance to correct initial set-up errors due to the small size of the lesions treated and the large dose delivered each fraction. The risk of a geographical miss would certainly be increased unless larger margins were used to account for the increased set-up uncertainty. Differences between initial patient set-up in the longitudinal and vertical directions were seen between patients having abdominal compression and those without. Abdominal compression led to greater variation in set-up errors and a shift in the mean set-up errors in these two directions.

113 Cone beam computed tomography (CBCT) based adaptive radiotherapy for lung cancer? The Christie experience

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Introduction: CBCT is used in many UK centres to improve treatment set-up accuracy. However, CBCT is not widely used for plan adaptation despite the potential benefits of correcting for changes in tumour size and position, patient anatomy, systematic rotational errors or weight loss during radiotherapy (RT). We describe our approach to CBCT based adaptive RT.

Methods: All lung cancer patients who underwent CBCT review during radical RT between December 2006 and September 2010 were included in this retrospective analysis. Besides the verification of the accuracy of set-up, the aims of the CBCT reviews are to ensure that: i) the intended planning target volume (PTV) coverage remains satisfactory; ii) the dose to PTV remains within 2% of the prescribed dose; iii) doses to the organs at risk (OAR) do not exceed tolerance. Our policy is not to shrink the Gross Target Volume if tumour regression is noted during RT.

Results: 62 patients were referred for CBCT review, of which 18 (29%) had their plans adapted: 2 displayed tumour progression; 8 displayed tumour regression; 2 displayed collapse of a lobe/lung, 6 showed tumour displacement or increased motion relative to the radiotherapy planning (RTP) scan. On average, 34.3% of the prescribed fractions had been delivered when the decision to adapt the RT plans was made.

In these 18 patients the CBCT review led to: (i) repeat plans based on CBCT fused with the original RTP scan (n=9); (ii) repeat plans based on a new RTP scan (n=3); (iii) reduction of monitor units by up to 4% (n=5); (iv) switch to palliative radiotherapy (n=1).

Conclusion: CBCTs are routinely used at our institution to adapt lung RT plans. This ensures more accurate treatment delivery and OAR avoidance. The impact of this technique on local control should be evaluated in further studies.

114 Lung stereotactic body radiotherapy (SBRT) for medically inoperable peripheral stage 1 non-small cell lung cancer (NSCLC): updated results from St James's Institute of Oncology, Leeds

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Background: Lung Stereotactic Body Radiotherapy (SBRT) was introduced at St. James's Institute of Oncology (SJIO) in May 2009 and is our standard of care for peripheral inoperable Stage 1 NSCLC