Materials and Methods: Radiotherapy (SABR) due to inability to respect dose-volume heart are not typically amenable for radical Stereotactic Ablative University of Manitoba, Winnipeg, MB Catharine Bromilow, Gordon Buduhan, Larry Tan, Biniam Rashi Kulshrestha, David Sasaki, Sankar Venkataraman. AN ANALYSIS

Purpose: Pulmonary tumours located in close proximity to the heart are not typically amenable for radical Stereotactic Ablative Radiotherapy (SABR) due to inability to respect dose-volume tolerances of cardiac tissues. We developed and delivered a novel methodology for safe SABR delivery for a lung tumour located 3mm adjacent to the heart.

Materials and Methods: A 66-year-old male with a 3.2x2.8cm left lower lobe lung (LLL) tumour located 3mm adjacent to his heart was assessed for image-guided SABR using a standard free-breathing 4DCT simulation scan and volumetric modulated arc therapy (VMAT) treatment planning however, cardiac constraints could not be met. A multidisciplinary team at CancerCare Manitoba designed a more precise SABR simulation and delivery technique. Three endobronchial radiofrequency tumour tracking beacons (Calypso™, Varian Medical Systems) were implanted in the small airways surrounding the LLL tumour. Custom immobilization setup with prone neck rest and full body vacuum lock bag was built, and CT simulation scan was obtained in Deep Inspiration Breath Hold (DIBH). Gated SABR (54Gy/3#) was delivered with telemetry confirming proper tumour positioning during DIBH with a 3mm PTV margin. Post-SABR position telemetry was collected for analysis.

Results: Prone DIBH SABR was delivered using 10MV Volumetric Modulated Arc Therapy (2400MU/min) over 6 to 8 breath holds per fraction with median duration of 25s per breath hold. Cone-beam images confirmed an acceptable heart-tumour separation as well as beacon location. Calypso telemetry revealed an average change in beacon position during DIBH for all fractions of 0.6, 0.3 and 0.7mm in the lateral, Superior-Inferior and Anterior-Posterior directions respectively. Interestingly, in the prone DIBH position, the LLL tumour to heart separation was observed to increase to a closest point of approach of 8mm, thereby increasing the therapeutic ratio of the SABR treatment. SABR was well tolerated and no severe acute or late toxicity was experienced.

Conclusions: Prone DIBH SABR with tumour localizing beacons is a highly precise method of SABR delivery with submillimetric levels of accuracy. Potential future applications of this technique include tumours located in close proximity to sensitive organs at risk. Further assessments of this technique are warranted.

198 STEREOTACTIC ABLATIVE RADIOTHERAPY (SABR) IN OLIGOMETASTATIC AND OLIGOPROGRESSIVE GYNECOLOGIC CANCERS: CLINICAL OUTCOMES OF A SINGLE INSTITUTION ANALYSIS

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Purpose: The role of stereotactic ablative radiotherapy (SABR) for gynecologic malignancies has not been clearly defined despite recent clinical uptake. This study evaluates the outcomes of SABR in patients with metastatic gynecologic cancer at a single institution.

Materials and Methods: Patients with gynecologic cancers treated from 2009-2019 were extracted from an institutional SABR database. Descriptive statistics were used to report patient and treatment characteristics. Toxicity and chemotherapy-free interval. Local recurrence-free survival (LRFS), distant progression-free survival (DPFS), and overall survival (OS) probabilities were calculated using Kaplan-Meier methods. The relationship of primary site, tumour grade, dose of radiotherapy, and disease free interval (DFI) to LRFS and DPFS were assessed using Cox regression methods for multivariable analysis (MVA).

Results: One hundred nine lesions in 77 patients with gynecologic cancer were treated with SABR. Median age was 63 and follow up after SABR was 16.4 months (1-79.6). Patients were treated with SABR for oligoprogressive disease (n=58), oligometastatic disease (n=34), or for local progression in critical areas (n=17). Primary site included cancers of the endometrium (n=36), cervix (n=19), ovary (n=15), and vulva or vaginal (n=7). Median DFI was 22.3 months (1.6-143.3) from diagnosis to metastasis. Treatment was delivered to lesions in the lung (n=25), pelvis (n=23) spine (n=17), para-aortic (n=16) and distant nodes (n=7), abdominal organs (n=13), and bone (n=8). Radiotherapy doses ranged from 25-60Gy (median 35Gy) in 2-5 fractions. Patients had between one and six lesions treated. Thirteen lesions recurred locally (11.9%) at a median of 7.6 months (range 0.5-17.6), and 76% of patients eventually had a distant recurrence after SABR. Median DPFS was 7.8 months (95% CI 3.6-11.9), and OS 31.5 months (95% CI 12.2-45.7). At 2 years, LRFS was 77.6%, DPFS was 19.6%, and OS was 51.9%. Thirty-two patients eventually required chemotherapy at median six months (range 1-37). There were no Grade 3-5 acute or late toxicities reported. On MVA, primary site, tumour grade, dose of radiotherapy and DFI were not significantly associated with LRFS or DPFS.

Conclusions: This cohort of patients had excellent LRFS and DPFS when treated with SABR for oligoprogressive, oligometastatic and locally progressive disease. SABR also has the potential to delay time to chemotherapy in patients with gynecologic cancers. Prospective multicentre trials will be critical to establish which primary disease sites and characteristics procure the greatest benefit from SABR use, to delineate optimal dose regimens, and to define the ideal time to implement SABR with other oncologic treatments.