Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

brain stem, spinal cord, parotid, and submandibular glands; higher than 0.5 dice for esophagus, oral cavity, larynx, and lips. Submitted segmentation with the dice coefficient lower than the established threshold often has missing slices, redundant slices, or erroneous overlapping with other structures. The detection specificity was found to be higher than 0.9. Due to the irregular shape of the pharynx and its overlapping with the target volume, the auto-segmentations have not achieved sufficient accuracy (with dice below 0.2).

Conclusion: Both commercial and in-house models demonstrate high specificity for submitted contour error detection for all the HN005 required OARs except for the pharynx. Comparison between AI and expert reviews will be included in future studies.

Author Disclosure: H. Geng: None. K. Men: None. S.S. Yom: Research Grant; Genentech, Merck, Bristol-Myers Squibb, BioMimetix. Honoraria; ASTRO. Co-Chair for Radiation Oncology; National Cancer Institute.; American Society for Radiation Oncology, American Radium Society. P. Xia: None. Y. Xiao: None.

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Quality Metric to Assess Adequacy of Hydrogel Rectal Spacer Placement for Prostate Radiotherapy and Association of Metric Score With Dosimetric and Gastrointestinal Toxicity Outcomes

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Purpose/Objective(s): Hydrogel rectal spacer placement (HSP) has been shown to minimize rectal dose during prostate cancer radiotherapy, yet its potential benefit for modulating rectal toxicity could in large part depend upon the quality of prostate-rectal separation achieved from HSP. We therefore developed a practical quality metric to evaluate HSP, validating its association with rectal dose reduction, as well as physician- and patient-reported rectal toxicity using a prospective dataset of men treated with prostate stereotactic body radiotherapy (SBRT).

Materials/Methods: Using the axial T2-weighted MRI images from a small pilot cohort of men with HSP who had been treated at our institution with prostate SBRT, a hydrogel spacer quality metric was devised from prostate-rectal space thickness (PRST) measurements. A score of 0, 1, or 2 was assigned to a PRST of < 0.3 cm, 0.3-0.9 cm, or ≥ 1 cm, respectively; an overall spacer quality score (SQS) was computed from individual scores (total of 9) at rectal midline and 1 cm to the right and left, located at the level of the prostate base, midgland, and apex. This quality metric was then applied to MRI simulation scans of 43 men with low/intermediate risk prostate cancer who had been enrolled on a multi-institutional phase II study to assess safety and efficacy of HSP during prostate SBRT. Associations between SQS and rectal dosimetry, late gastrointestinal (GI) toxicity, and EPIC bowel quality of life were quantified in these men treated with 45 Gy in 5 fractions.

Results: Among this cohort, the majority had a SQS of 1 ($n = 18$; 42%) or 2 ($n = 18$; 42%). SQS was associated with maximum rectal point dose (rectal Dmax; $P = 0.001$), maximum dose to 1 cc of rectum (D1cc; $P = 0.003$), and volume of rectum receiving $\geq 100\%$ of prescription dose (V45; $P = 0.03$). For those with SQSs of 0, 1 and 2, the median rectal Dmax (cGy) was 4683, 4600, and 3921, respectively. SQS was associated with incidence of late GI toxicity ($P = 0.03$) and highest late GI toxicity score ($P = 0.02$). Among the 20 men who developed late GI toxicity, 57%, 67% and 22% with Grade ≥ 1 had a SQS of 0, 1, and 2, respectively. Men with SQSs of 2 compared to 0-1 had 1.36 times lower odds of an increased rectal Dmax (95% CI: 1.14-1.63); and 1.20 times lower odds of an increased rectal D1cc (95% CI: 1.07-1.34). Men with SQSs of 2 versus 0-1 had 3.30 times lower odds of a higher late GI toxicity score (95% CI: 1.18-9.28). While evidence of a significant difference in baseline EPIC bowel summary score between SQSs was not observed ($P = 0.07$) as expected, men with SQSs of 2 compared to 0-1 had 3.52 times higher odds (95% CI: 0.91-13.64) of a superior bowel summary score 12 months from prostate SBRT.

Conclusion: We developed a reliable, easy to use, and informative metric for assessing HSP, which appears to be associated with rectal dosimetry and late GI toxicity in men treated with prostate SBRT.

Author Disclosure: C.E. Grossman: None. M.R. Folkert: Research Grant; Medtronic, Inc., Augmenix, Inc. Travel Expenses; Varian, Inc., Boston Scientific, Inc. S. Lobaugh: None. N.B. Desai: Research Grant; Boston Scientific. N. Hassan Rezaeian: None. M.A. Kollmeier: None. D. Gorovets: None. D. Shasha: None. S. McBride: Research Grant; Astra Zeneca, Janssen, Roche. Honoraria; Astra Zeneca. R.D. Timmerman: Research Grant; Varian Medical Systems, Accuray, Inc, Elekta Oncology. R. Hannan: Research Grant; Dendreon Corporation, Prometheus Laboratories. Y. Lotan: None. Z. Zhang: None. M.J. Zelefsky: Consultant; Alpha Tau- Radiopharmaceuticals, Boston Scientific. Advisory Board; Boston Scientific. Editor in Chief; Brachytherapy.

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Impact of the COVID-19 Pandemic on Radiation Treatment Termination Patterns at a Large Multi-Center Institution

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Purpose/Objective(s): Premature discontinuation of radiation therapy (RT) is a significant challenge portending inferior outcomes, particularly with curative intent RT. This study measures the impact of the COVID-19 pandemic compared to prior treatment terminations (TTs) from a multi-institutional health system in the New York Metropolitan area.

Materials/Methods: TT data was collected from the internal quality assurance records of a multicenter radiation oncology department for the September 2019-February 2020 pre-pandemic interval (BP) and the March 2020-August 2020 post-pandemic interval (AP). We measured aggregate and monthly CT simulations (CT sims), TTs, and terminations with zero fractions of radiation given (0Fx), the latter stratified by palliative vs. curative intent (0Fx-P vs. 0Fx-C). AP TTs attributed to COVID-19 anxiety were also obtained. The data were analyzed as aggregate ratios with monthly weighting of TTs/CT sims, 0Fx/CT sims, and 0Fx/TTs. Ratio statistics were employed and 95% confidence intervals generated. 0Fx-P and 0Fx-C were tested for association with BP and AP by chi-square analysis.

Results: For BP and AP respectively: TTs/CT sims were 8.1% (95% CI 5.2%-11.0%) and 11.2% (95% CI 9.2%-13.3%); 0Fx/CT sims were 1.4% (95% CI 0.16%-2.70%) and 2.5% (95% CI 1.49%-3.6%); 0Fx/TTs were 15.8% (95% CI 6.35%-25.21%) and 22% (95% CI 16.0%-27.9%). The association of 0Fx-P and 0Fx-C with BP and AP yielded chi-square = 0.43, $P = 0.51$. TTs attributed to COVID-19 anxiety comprised 3.9% of TTs in AP.

Conclusion: The endpoints for TTs in the BP and AP periods in our study cohort were suggestive of a COVID impact on patients discontinuing radiation therapy, but without statistical significance. Given the subtleties of TT dynamics and uncertainties such as the count of COVID-19 anxiety-related terminations, along with a relatively small sample size, it is reasonable to infer that this review was underpowered. Moreover, direct statistical attribution of TTs to COVID understates knock-on effects, e.g., the

case of a 0Fx TT that would have occurred regardless of COVID but under the stress of the pandemic exacerbates the harm of the waste of resources. At the patient care level, understanding how COVID affects TT patterns may enable interventions that facilitate completion of care as intended by the treating physician. At the health system level, such understanding may elucidate a plausible mechanism of COVID's cascading downstream influence on oncologic outcomes. Nevertheless, it will require a multi-institutional cohort to quantitatively discern the impact of the pandemic on TT dynamics.

Author Disclosure: D. Koffler: None. D.C. Ma: None. J. Eckstein: None. B.U. Sidiqi: None. N. Adair: None. S. Joseph: None. B.F. Bloom: None. L. Potters: None. S. Teckie: None. W. Chen: None.

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Significant Incidental Findings Unrelated to the Primary Cancer on CT Simulation Treatment Planning Scans

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Purpose/Objective(s): Incidental tumor findings on radiographic imaging are rare and often do not manifest symptoms such as a lump or associated pain. These tumors may represent major clinically relevant findings that need additional imaging and testing. Although some studies published metastatic disease of the primary cancer, we are not aware of publications in the U.S. focusing solely on major, significant findings, and unrelated to the primary disease during radiotherapy planning. In this paper, we introduce several cases where CT planning images revealed significant clinical findings unrelated to the primary cancer that required further investigation. All patients with these major findings were followed-up for diagnostic imaging, examination, and proper referral.

Materials/Methods: To simulate real-life situation when CT treatment planning is performed in a radiation oncology department, the radiation oncologist reviewed a total of 115 patients with CT treatment planning that was performed during the 2-year period of 2017-2018. These CTs were performed during routine radiotherapy planning for curative purposes: brain tumors (n = 10 or 9%), head and neck cancer (n = 15 or 13%), lung cancer (n = 30 or 26%), breast cancer (n = 35 or 30%), prostate cancer (n = 25 or 22%).

Results: We report incidental but significant findings on radiotherapy planning CT scans unrelated to the primary cancer. A total of 4 abnormal findings (3 neoplasms and 1 benign) were discovered from a total of 115 CT scans done for radiotherapy planning. The 3 neoplasms were: hepatocellular carcinoma, thyroid cancer, and large adrenal adenoma. The one benign finding was extensive eventration of the left hemi-diaphragm.

Conclusion: CT planning scans are routinely performed separately in the radiation oncology department for proper treatment mapping of cancer patients. These CT images are usually stored in the RO department server and not in radiology PACS system. At the present time, it is not known how many percent of radiation oncologists routinely check CT scans for incidental findings. The 4 case reports stated in this article demonstrate that although rare, there are malignancies/abnormalities unrelated to the primary cancer that could be missed in the CT planning process. We therefore recommend that radiation oncologists take charge of this issue and implement a method of proper interpretation of CT simulation images by either the radiation oncologists responsible for the case, or designated diagnostic radiologists (if such arrangement exists), to ensure that incidental findings are not missed. In any radiation oncology (RO) department, a routine QA (quality assurance) checklist often includes: consultation note, verification of pathology, consent form, verification of dosimetry, verification of physics report etc., we believe that proper interpretation of CT simulation images for incidental findings should be part of the QA checklist in a modern RO department

Author Disclosure: C. Nguyen: None. N. Dietz: None. A. Singh: None.

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Effects of Bladder Filling and Rectal Gas on Number of CBCT Scans and Treatment Time for Prostate Cancer Patients Undergoing EBRT

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Purpose/Objective(s): Prostate cancer patients undergoing EBRT may be treated with a full bladder and empty rectum to maintain a consistent prostate position. To optimize setup for hypofractionated regimens, cone beam CT (CBCT) scans may be performed to assess the level of bladder filling and the amount of rectal gas before each treatment. However, achieving a precise bladder volume and minimizing rectal gas prior to radiation treatment can be difficult and time-consuming. This process often leads to repeated CBCT scans, treatment delays, and an unpleasant patient experience. We prospectively evaluated the interplay between bladder filling, rectal gas, number of CBCT scans, and the total in-department time. We evaluated whether there was sufficient clinical evidence to justify the use of an alternative imaging technique to reduce the number of CBCT scans and improve treatment efficiency.

Materials/Methods: For bladder and bowel preparation, patients drank 8 oz of water 45-60 mins prior to CBCT scans and took simethicone twice daily and psyllium supplementation daily throughout the treatment course in addition to a saline enema 2-3 hours before CBCT. Inadequate bladder filling prompted oral administration of 8 oz of water and a 20-30-minute delay. Excess rectal gas was passed either voluntarily or via a rectal tube. Relevant data, such as patient arrival time, the number of CBCT scans, and total in-department time, were recorded.

Results: We evaluated 475 individual treatments among 194 patients. A total of 34.3% of treatments had bladder filling events, 17.7% had rectal gas events, and 10.5% had both events. The number of CBCT scans had a right-skewed Poisson distribution, with mean 1.43 $\pm$ 0.88 (range 0-5). 47.4% of treatments had 1 CBCT scan, 31.8% had 2 CBCT scans, 7.8% had 3 CBCT scans, 1.7% had 4 CBCT scans, and 0.4% had 5 CBCT scans. The distribution of the number of retries (taken off the table) heavily clustered in 0 and 1. 66% of treatments had 0 retries, 19% had 1 retries, 13% had 2 retries, and 2% had 3 retries. The mean and median actual in-department times were 68.9 $\pm$ 41.9 and 60.0 mins, while the mean and median scheduled appointment times were 30.1 $\pm$ 16.6 and 20 mins. The actual in-department time had a range of 18-245 mins. The median actual in-department time was significantly different from the median scheduled appointment time (P = 2.2e-16). The difference between the two was 40.0 mins.

Conclusion: Our findings demonstrate that the level of bladder filling affected the number of CBCT scans, number of retries, and ultimately the total in-department time. There was sufficient clinical evident to support the use of an alternative imaging technique, such as bladder ultrasound, to reduce the number of repeat CBCT scans and improve the overall treatment efficiency of prostate cancer.

Author Disclosure: Y. Song: None. W. Ko: None. P. Tamas: None. H. Hsu: None. B.A. Mueller: None. L.Z. Braunstein: None. D.M. Guttmann: None. L.R. Pike: None. A.J. Tamas: None.

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Improving Radiation Oncology (RO) Quality and Workflow by Implementation of a Standardized Daily Huddle

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