

Journal club November - December 2021

- Turner K, Brownstein NC, Thompson Z, El Naqa I, Luo Y, Jim HSL, Rollison DE, Howard R, Zeng D, Rosenberg SA, Perez B, Saltos A, Oswald LB, Gonzalez BD, Islam JY, Tabriz AA, Zhang W, Dilling TJ. **Longitudinal patient-reported outcomes and survival among early-stage non-small cell lung cancer patients receiving stereotactic body radiotherapy.** Radiother Oncol. 2021 Dec;167:116-121. doi: 10.1016/j.radonc.2021.12.021.

Longitudinal changes in patient reported outcomes are associated with increased mortality.

- Ganesan G, Ponniah S, Sundaram V, Marimuthu PK, Pitchaikannu V, Chandrasekaran M, Thangarasu J, Kannupaiyan G, Ramamoorthy P, Thangaraj B, Govindaraj HS, Raguram SV. **Whole lung irradiation as a novel treatment for COVID-19: Final results of the prospective randomized trial (WINCOVID trial).** Radiother Oncol. 2021 Dec;167:133-142. doi: 10.1016/j.radonc.2021.12.024.

First prospective, randomized trial comparing low dose radiotherapy plus pharmacological therapy vs pharmacological therapy alone for moderate to severe COVID-19.

- Groen VH, van Schie M, Zuithoff NPA, Monninkhof EM, Kunze-Busch M, de Boer JCJ, van der Voort van Zijp J, Pos FJ, Smeenk RJ, Haustermans K, Isebaert S, Draulans C, Depuydt T, Verkooijen HM, van der Heide UA, Kerkmeijer LGW. **Urethral and bladder dose-effect relations for late genitourinary toxicity following external beam radiotherapy for prostate cancer in the FLAME trial.** Radiother Oncol. 2021 Dec;167:127-132. doi: 10.1016/j.radonc.2021.12.027.

Dose to the bladder and urethra is related to GU toxicity. Urethral dose-effect relations for hypofractionated schemes should be analyzed.

- Martin T, Neylon J, Casado M, Sharma S, Sheng K, Low D, Yang Y, Steinberg ML, Lamb J, Cao M, Kishan AU. **Dosimetric impact of interfraction prostate and seminal vesicle volume changes and rotation: A post-hoc analysis of a phase III randomized trial of MRI-guided versus CT-guided stereotactic body radiotherapy.** Radiother Oncol. 2021 Dec;S0167-8140(21)09085-X. doi: 10.1016/j.radonc.2021.12.037.

Prostate volume consistently increased during the course of prostate SBRT. Interfraction prostatic rotation was minimal. Rotation of the proximal seminal vesicle was considerable.

- Wennerberg J, Gebre-Medhin M, Nilsson P, Brun E, Kjellén E, Carlwig K, Reizenstein J, Kristiansson S, Söderkvist K, Wahlgren M, Zackrisson B; ARTSCAN study group. **Results from a prospective, randomised study on (accelerated) preoperative versus (conventional) postoperative radiotherapy in treatment of patients with resectable squamous cell carcinoma of the oral cavity - The ARTSCAN 2 study.** Radiother Oncol. 2021 Nov;166:26-32. doi: 10.1016/j.radonc.2021.11.008.

A randomized controlled trial on preoperative radical radiotherapy with accelerated fractionation versus postoperative conventionally fractionated (\pm chemo-) radiotherapy in squamous carcinoma of the oral cavity.

- Sheikh S, Chen H, Sahgal A, Poon I, Eler D, Badellino S, Dagan R, Foote MC, Louie AV, Redmond KJ, Ricardi U, Biswas T. **An analysis of a large multi-institutional database**

reveals important associations between treatment parameters and clinical outcomes for stereotactic body radiotherapy (SBRT) of oligometastatic colorectal cancer. *Radiother Oncol.* 2021 Dec;167:187-194. doi: 10.1016/j.radonc.2021.12.018.

A biological equivalent dose of ≥ 120 Gy led to an improvement in local recurrence. A larger total PTV size (≥ 17.5 cc) was associated with worse overall survival, progression free survival, and widespread progression.

- Navarra P, Pessina F, Clerici E, Bellu L, Franzese C, Franzini A, Simonelli M, Bello L, Santoro A, Politi LS, D'agostino GR, Casarotti A, Fernandes B, Torri V, Scorsetti M. **Re-irradiation for recurrent high grade glioma (HGG) patients: Results of a single arm prospective phase 2 study.** *Radiother Oncol.* 2021 Dec;167:89-96. doi: 10.1016/j.radonc.2021.12.019.

Re-irradiation has proven to be a safe and effective treatment for recurrent high grade glioma. No impairment in neurocognitive functions has been recorded follow re-irradiation.

- Dong X, Huang Y, Yu X, Huang M, Jiang W, Chen D, Wang G, Zhuo S, Chi P, Yan J. **Collagen score in the tumor microenvironment predicts the prognosis of rectal cancer patients after neoadjuvant chemoradiotherapy.** *Radiother Oncol.* 2021 Dec;167:99-108. doi: 10.1016/j.radonc.2021.12.023.

Collagen score of the tumor margin minus tumor center was proposed and analyzed using multiphoton imaging. It was an effective prognostic predictor in advanced rectal cancer.

- Ramesh S, Chokkara S, Shen T, Major A, Volchenboum SL, Mayampurath A, Applebaum MA. **Applications of Artificial Intelligence in Pediatric Oncology: A Systematic Review.** *JCO Clin Cancer Inform.* 2021 Dec;5:1208-1219. doi: 10.1200/CCI.21.00102.

Machine learning continues to be a growing area of focus in pediatric oncology, particularly in areas such as diagnostics, decision making, and disease monitoring.

- Vogelbaum MA, Brown PD, Messersmith H, Brastianos PK, Burri S, Cahill D, Dunn IF, Gaspar LE, Gatson NTN, Gondi V, Jordan JT, Lassman AB, Maues J, Mohile N, Redjal N, Stevens G, Sulman E, van den Bent M, Wallace HJ, Weinberg JS, Zadeh G, Schiff D. **Treatment for Brain Metastases: ASCO-SNO-ASTRO Guideline.** *J Clin Oncol.* 2021 Dec;JCO2102314. doi: 10.1200/JCO.21.02314.

This guideline provides recommendations, with comprehensive review and analyses of the relevant literature for each recommendation for patients with brain metastases from solid tumors.

- Mignot F, Quero L, Guillerm S, Benadon B, Labidi M, Cuvier C, Giacchetti S, Lorphelin H, Cahen-Doidy L, Teixeira L, Espie M, Hennequin C. **Ten-year outcomes of hypofractionated postmastectomy radiation therapy of 26 Gy in 6 fractions.** *Int J Radiat Oncol Biol Phys.* 2021 Dec;S0360-3016(21)03426-X. doi: 10.1016/j.ijrobp.2021.12.154.

Hypofractionated postmastectomy radiation therapy of 26 Gy in 6 fractions over 5 weeks seems safe but locoregional recurrence seems slightly higher than those observed in the literature.

- Wang Y, Zhang T, Huang Y, Li W, Zhao J, Yang Y, Li C, Wang L, Bi N. **Real-world Safety and Efficacy of Consolidation Durvalumab after Chemoradiotherapy for Stage III Non-**

small-cell Lung Cancer: A Systematic Review and Meta-analysis. Int J Radiat Oncol Biol Phys. 2021 Dec; S0360-3016(21)03422-2. doi: 10.1016/j.ijrobp.2021.12.150.

The safety and short-term efficacy of consolidation durvalumab in real-life use align with the PACIFIC trial.

- Smet S, Spampinato S, Pötter R, Jürgenliemk-Schulz IM, Nout RA, Chargari C, Mahantshetty U, Sturdza A, Segedin B, Bruheim K, Hoskin P, Rai B, Huang F, Cooper R, Van der Steen-Banasik E, Sundset M, Van Limbergen E, Tan LT, Lutgens LCHW, Villafranca E, Pieters BR, Tanderup K, Kirchheiner K; EMBRACE Collaborative Group. **Risk Factors for Late Persistent Fatigue After Chemoradiotherapy in Patients With Locally Advanced Cervical Cancer: An Analysis From the EMBRACE-I Study.** Int J Radiat Oncol Biol Phys. 2021 Nov;S0360-3016(21)03220-X. doi: 10.1016/j.ijrobp.2021.11.022.

Late persistent fatigue occurs in a considerable number of patients after chemoradiotherapy, and is associated with patient-related factors, the size of volumes irradiated to intermediate and high EBRT and brachytherapy doses, and other persistent organ-related morbidity.

- Tinganelli W, Sokol O, Quartieri M, Puspitasari A, Dokic I, Abdollahi A, Durante M, Haberer T, Debus J, Boscolo D, Voss B, Brons S, Schuy C, Horst F, Weber U. **Ultra-High Dose Rate (FLASH) Carbon Ion Irradiation: Dosimetry and First Cell Experiments.** Int J Radiat Oncol Biol Phys. 2021 Nov;S0360-3016(21)03129-1. doi: 10.1016/j.ijrobp.2021.11.020.

Authors provide a guideline on how to perform FLASH experiments at a heavy ion synchrotron and report the in vitro experiment's results aimed at detecting the differences between FLASH and conventional irradiations on a biological level.

- Cook A, Modh A, Ali H, Sheqwara J, Chang S, Ghanem T, Momin S, Wu V, Tam S, Money S, Han X, Fakhoury L, Movsas B, Siddiqui F. **Randomized Phase 3, Double-blind, Placebo-controlled Study of Prophylactic Gabapentin for the Reduction of Oral Mucositis Pain During the Treatment of Oropharyngeal Squamous Cell Carcinoma.** Int J Radiat Oncol Biol Phys. 2021 Nov;S0360-3016(21)03121-7. doi: 10.1016/j.ijrobp.2021.11.012.

Prophylactic gabapentin is not effective in improving treatment-related oral mucositis symptoms.

- Cellini F, Di Franco R, Manfrida S, Borzillo V, Maranzano E, Pergolizzi S, Morganti AG, Fusco V, Deodato F, Santarelli M, Arcidiacono F, Rossi R, Reina S, Merlotti A, Jereczek-Fossa BA, Tozzi A, Siepe G, Cacciola A, Russi E, Gambacorta MA, Scorsetti M, Ricardi U, Corvò R, Donato V, Muto P, Valentini V. **Palliative radiotherapy indications during the COVID-19 pandemic and in future complex logistic settings: the NORMALITY model.** Radiol Med. 2021;126(12):1619-1656. doi: 10.1007/s11547-021-01414-z.

A comprehensive summary of the literature guideline indications for PRT during COVID-19 pandemic. Authors proposed the “No cOmpRoMise on quality of life by pAlliative radIoTherapY” (NORMALITY) model.

- Francolini G, Stocchi G, Detti B, Di Cataldo V, Bruni A, Triggiani L, Guerini AE, Mazzola R, Cuccia F, Mariotti M, Salvestrini V, Garlatti P, Borghesi S, Ingrosso G, Bellavita R, Aristei C, Desideri I, Livi L. **Dose-escalated pelvic radiotherapy for prostate cancer in definitive or postoperative setting.** Radiol Med. 2021 Nov; doi: 10.1007/s11547-021-01435-8.

Pelvic irradiation and boost on positive nodes are effective approaches in clinically node-positive (cN1) prostate cancer.

- Valeriani M, Detti B, Fodor A, Caini S, Borghesi S, Trippa F, Triggiani L, Bruni A, Russo D, Saldi S, Di Staso M, Francolini G, Lancia A, Marinelli L, Di Muzio N, Aristei C, Livi L, Magrini SM, Ingrosso G. **Radiotherapy at oligoprogression for metastatic castration-resistant prostate cancer patients: a multi-institutional analysis.** Radiol Med. 2021 Nov; doi: 10.1007/s11547-021-01424-x.

Radiotherapy in oligoprogressive metastatic castration-resistant prostate cancer (mCRPC) is safe, effective and seems to prolong the efficacy of androgen receptor-target therapy (ARTT) in patients who otherwise would have gone systemic treatment switch, positively affecting disease progression.