second, what is the role of human papilloma virus (HPV) in outcomes after retreatment?

Regarding the first inquiry, it is true that GTV is prognostic and worth considering when selecting patients for retreatment. Our analysis includes patients treated in both the postoperative and definitive setting, with GTV difficult to apply across settings. In the definitive setting alone, we would refer to the accompanying analysis by Vargo et al (2), which used a GTV cutoff of 25 cm^3 in subset comparisons. When stratifying by recursive partitioning analysis (RPA) class (Vargo Fig. 1D-E), the 25 cm^3 cutoff did seem to affect survival, but not to the degree of the RPA class (2). For these reasons, we tend to consider RPA class to be a broad classification and GTV a "minor" but important factor useful to add nuance.

Regarding the question of HPV, we would note that oropharynx and oral cavity tumors performed significantly worse than the arbitrary reference category of nasopharynx or base-of-skull recurrences. In fact, oral cavity patients experienced the worst outcomes of any disease site. Here we would also refer to the companion article investigating dose, volume, and fractionation by Caudell et al (Supplement Fig. E2) (3), which plots overall survival among recurrent or second primary oropharynx cancers stratified by HPV status. In the 65 patients with known HPV status, improved survival was noted in the HPV+ patients, but this difference did not meet statistical significance. It would seem, therefore, that although HPV may play a role in outcome after retreatment, HPV status may not be a key factor given the aggressive and distinct nature of recurrent or second primary cancers.

In conclusion, we would agree that there is an array of variables that influence patient selection. Our hope is that the RPA will provide a broad overview by identifying 3 homogeneous cohorts which practitioners can use as a starting point for the nuanced decision process required in these challenging scenarios.

Matthew C. Ward, MD
Radiation Oncology
Southeast Radiation Oncology Group, PA
Charlotte, North Carolina

Shlomo A. Koyfman, MD
Department of Radiation Oncology
Taussig Cancer Institute
Cleveland Clinic
Cleveland, Ohio

https://doi.org/10.1016/j.ijrobp.2018.05.014

References

1. Yildirim BA, Topkan E. In regard to Ward et al. *Int J Radiat Oncol Biol Phys* 2018;101:1273.
2. Vargo JA, Ward MC, Caudell JJ, et al. A multi-institutional comparison of SBRT and IMRT for definitive reirradiation of recurrent or second primary head and neck cancer. *Int J Radiat Oncol Biol Phys* 2018;100:595-605.
3. Caudell JJ, Ward MC, Riaz N, et al. Volume, dose, and fractionation considerations for IMRT-based reirradiation in head and neck cancer: A multi-institution analysis. *Int J Radiat Oncol Biol Phys* 2018;100:606-617.

The Radiation Safety of 5G Wi-Fi: Reassuring or Russian Roulette?

To the Editor: The impending rollout of fifth-generation (5G) Wi-Fi in mobile phones, augmenting the current fourth-generation (4G) technology toward making global interconnectivity between devices a reality, has been touted as a significant improvement of speed compared to current and previous wireless signaling (1). Less well explored are the potential consequences associated with this need for speed: namely, the substantial increase in biologic exposure to radiofrequency electromagnetic fields from the 1900-2100 MHz associated with 4G to the 3500 MHz estimated median bandwidth of 5G (2).

While studies of human lymphocytes have indicated no impact of short-term (30-minute) 900 MHz exposure on DNA integrity, animal studies have demonstrated that long-term exposure to 900-1800 MHz via second-generation mobile phone radiation (48 min/d for 30-180 days) induces hippocampal damage. In fact, a recent investigation of human neuroblastoma cells revealed enhanced susceptibility to oxidative stress even after 1800 MHz exposure for only 10 minutes, with concomitantly increasing reactive oxygen species levels at 30- and 60-minute exposures (3-5). Due to safety concerns of the doubling of dosage from these levels associated with 5G adoption, a worldwide consortium of physicians and scientists from more than 35 countries has recommended a moratorium on 5G rollout pending further safety investigation (1).

What is the role of the medical community (particularly radiation oncology) in this arena? Are we to remain silent while focusing only on optimizing care of our immediate patients, or do we have a responsibility to utilize our clinical knowledge of radiation safety and efficacy to aid in preventing corporate profit from being the primary determinant of acceptable radiation exposure from wireless networks?

Shearwood McClelland, III, MD
Jerry J. Jaboin, MD, PhD
Department of Radiation Medicine
Oregon Health and Science University
Portland, Oregon

https://doi.org/10.1016/j.ijrobp.2018.04.051

Conflict of interest: none.

References

1. Hertsgaard M, Dowie M. How big wireless made us think that cell phones are safe: A special investigation. Available at: https://www.thenation.com/article/how-big-wireless-made-us-think-that-cell-phones-are-safe-a-special-investigation/. Accessed April 2, 2018.
2. GSMA. Considerations for the 3.5 GHz IMT range: getting ready for use. May 2017. Available at: https://www.gsma.com/spectrum/wp-content/uploads/2017/06/Considerations-for-the-3.5-GHz-IMT-range-v2.pdf. Accessed April 2, 2018.
3. Danese E, Lippi G, Buonocore R, et al. Mobile phone radiofrequency exposure has no effect on DNA double strand breaks (DSB) in human lymphocytes. *Ann Transl Med* 2017;5:272.
4. Mugunthan N, Shanmugasamy K, Anbalagan J, et al. Effects of long term exposure of 900-1800 MHz radiation emitted from 2G mobile phone on mice hippocampus—a histomorphometric study. *J Clin Diagn Res* 2016;10:AF01-AF06.
5. Marjanovic Cermak AM, Pavicic I, Trosic I. Oxidative stress response in SH-SY5Y cells exposed to short-term 1800 MHz radiofrequency radiation. *J Environ Sci Health A Tox Hazard Subst Environ Eng* 2018;53:132-138.