

Treatment-related toxicity in lung cancer: Radiation induced or radiation attributed?

Sir,

We read with great interest the article by Pulle *et al.* concerning two rare complications, esophageal perforation and aortic rupture, in a single patient with lung cancer that was attributed to radiation therapy.^[1] We would like to congratulate the authors on the successful management of these dreadful complications and also raise some points.

Radiation injury of mediastinal structures following stereotactic body radiation therapy (SBRT) is a well-recognized toxicity and has led to the introduction of the “no-fly” zone.^[2] This is an area around the proximal bronchial tree, heart, major vessels, and esophagus where SBRT is avoided due to life-threatening toxicity. However, this patient received fractionated radiotherapy, not SBRT, and at a relatively moderate dose of 54 Gy. In a retrospective study from Singh *et al.*, in 207 patients with lung cancer undergoing fractionated radiotherapy, no case of Grade 3–5 esophageal toxicity occurred when the maximal point dose to the esophagus was <58 Gy.^[3] Regarding aorta dose tolerance, we have some data from re-irradiation cohorts. Thirty-five patients who received two courses of radiation therapy for thoracic tumors, with daily fraction 1.2–3.0 Gy, had 0% risk for Grade 5 aorta toxicity when the composite dose to the aorta was 120.0 Gy, as a raw dose, and 90.0 Gy when the dose was corrected for long-term recovery during the retreatment interval.^[4] Another re-irradiation study with 33 patients had a single Grade 5 event with an aorto-esophageal fistula after receiving an estimated aortic 2 Gy equivalent composite maximum dose of 200 Gy.^[5] Besides dose, the timing of complications’ manifestation is not congruent with radiation-induced toxicity, particularly the esophageal perforation that occurred immediately after the completion of radiotherapy. Finally, the patient underwent two major operations in the thorax (a lobectomy and a pneumonectomy), with adjuvant chemotherapy and a local recurrence in between, all of which could have contributed to tissue damage. Therefore, we think that the etiopathogenesis of the complications is multifactorial in nature, and although radiotherapy likely triggered these dramatic events, it was not exclusively responsible for them.

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Conflicts of interest

There are no conflicts of interest.

**Efstathios Kamperis, Chionia Kodona¹,
Vasileios Giannouzakos**

Departments of Radiation Oncology and ¹Medical Physics,
Papageorgiou General Hospital, Thessaloniki, Greece.
E-mail: ekamperi@gmail.com

References

1. Pulle MV, Puri HV, Asaf BB, Kumar A. Two rare complications in a single patient of lung cancer: Radiation-induced spontaneous esophageal perforation and aortic rupture and their successful management. *Ann Thorac Med* 2019;14:213-5.
2. Timmerman R, McGarry R, Yiannoutsos C, Papiez L, Tudor K, DeLuca J, *et al.* Excessive toxicity when treating central tumors in a phase II study of stereotactic body radiation therapy for medically inoperable early-stage lung cancer. *J Clin Oncol* 2006;24:4833-9.
3. Singh AK, Lockett MA, Bradley JD. Predictors of radiation-induced esophageal toxicity in patients with non-small-cell lung cancer treated with three-dimensional conformal radiotherapy. *Int J Radiat Oncol Biol Phys* 2003;55:337-41.
4. Evans JD, Gomez DR, Amini A, Rebueno N, Allen PK, Martel MK, *et al.* Aortic dose constraints when reirradiating thoracic tumors. *Radiother Oncol* 2013;106:327-32.
5. Kilburn JM, Kuremsky JG, Blackstock AW, Munley MT, Kearns WT, Hinson WH, *et al.* Thoracic re-irradiation using stereotactic body radiotherapy (SBRT) techniques as first or second course of treatment. *Radiother Oncol* 2014;110:505-10.

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