Screening for Head and Neck Tumors in Childhood Irradiation

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ABSTRACT

It is estimated that over 1 million individuals in the U.S. received radiation exposure as children for benign conditions of the head and neck. In 2011, we documented the clinical presentation of a person who underwent childhood irradiation for adenoid hypertrophy and subsequently developed bilateral acoustic neuromas. We hypothesized that head and neck irradiation for benign disease may lead to long-term complications.

Hypothesis: Childhood head and neck irradiation for benign disease has been abandoned since the 1960s, knowledge of its long-term persistence continues to be of interest.

Methods: Four patients who each demonstrated three or more potentially radiation induced tumors of the head and neck are described. Each patient's cancer history was described following the literature describing the relationship between these tumors and childhood irradiation. We present a small case series of patients with multiple potentially radiation induced head and neck tumors. This case series is used to screen and evaluate patients for head and neck radiation that includes the variables at risk of radiation induced trajectories.

RESULTS

Our cases highlight the correlation between childhood radiation exposure and multiple head and neck tumors. It is well documented that childhood radiation exposure increases the chance that a person will develop both benign and malignant thyroid nodules. In addition to thyroid we report cases of salivary tumors, acoustic neuromas and basal cell carcinoma.

Four patients with a history of childhood radiation exposure who presented with three or more head and neck tumors are presented to demonstrate the variable presentation of this phenomenon. Only patient three was able to recover medical documents relating to childhood radiation administered, which is noted to have occurred in 1946 for “enlarged tonsils” with three treatments over a 10-week period for a total of 1,800 roentgens. The estimated “absorbed” dose to the thyroid was 65 cGray.

We propose an algorithm to evaluate patients who present with a history of childhood radiation exposure. The algorithm is designed to screen for thyroid, parathyroid, salivary, and skin pathology.

We aim to not only raise awareness about the need to evaluate patients with childhood irradiation for malignancies and head and neck malignancies as a consequence of radiation exposure, but to also apply and incorporate this algorithm in the evaluation of patients with a history of radiation for all the aforementioned tumors.

DISCUSSION

The following screening algorithm is proposed for patients with a remote history of childhood irradiation given for benign conditions of the head and neck. Three of the four individuals are now more than 40 years post-radiation exposure. We also suggest this algorithm may be used if patients have a known history of childhood radiation for other reasons, such as Hodgkin’s disease.

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CONCLUSION

Patients with a history of childhood irradiation present a risk for a multitude of head and neck neoplasms and need thorough screening and evaluation. The proposed screening algorithm is designed to screen for thyroid, parathyroid, salivary, and skin pathology.

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REFERENCES