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Second Primary Cancer after Irradiation of Carcinoma Glottis

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ABSTRACT

Laryngeal carcinomas accounts for approximately 1.7 percent of all newly diagnosed cancer which is 25 percent of head and neck malignancies and among that ,90 percent is squamous cell carcinoma[1].The majority of laryngeal carcinomas are squamous cell carcinoma. Cancer of the larynx is most often found in males over the age of 50. It is often associated with heavy tobacco and alcohol use . The most common treatment options for laryngeal cancer patients are radiotherapy, surgery and chemotherapy. [2]

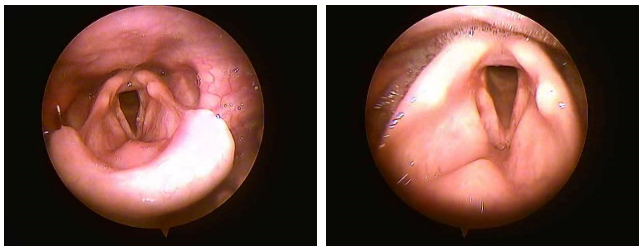
In this article, we present a case of second primary carcinoma glottis (Left vocal cord) who presented to us following radiotherapy 15years back for carcinoma glottis (Right vocal cord). Our discussion is mainly towards radiotherapy itself being a cause for this second primary.

Case report

Our patient is a 40 year old male with a known history of well differentiated squamous cell carcinoma of Right vocal cord, treated with surgery (Microlaryngeal Excision) followed by external radiotherapy 60Gy in 6weeks in 30 cycles,15years ago and was on regular follow up, presented to us with complaints of hoarseness of voice and foreign body sensation in throat for 1month.He is a non-smoker and non-alcoholic and plumber by occupation.

On physical examination no cervical lymph nodes were palpable . Laryngoscopic examination showed a irregularity on the left vocal cord ,in the junction of anterior 1/3 and posterior 2/3. He underwent microlaryngeal excision and the growth in the left vocal cord was excised.

A diagnosis of squamous cell carcinoma was established by histopathological examination. It showed the tissue bits were lined by stratified squamous epithelium with radiotherapy induced vacuolation.



Laryngoscopic examination showing a) left vocal cord irregularity b) post operative bilateral vocal cords normal and mobile.

Discussion

This report supports the theory that, radiotherapy itself being a cause for late second primary laryngeal carcinoma. In early stages of laryngeal cancer, endolaryngeal surgery followed by radiotherapy is the treatment of choice .There is evidence of many radiotherapy cohort studies showing excellent success rates for early laryngeal cancer .There may also be a limited role in low volume recurrences following radiotherapy.[9,10] Larynx cancer is the most common form of head and neck squamous cell carcinoma (HNSCC).

Radiotherapy is a major treatment modality and is implicated in the possible formation of second primary tumours (SPT). Ionising radiation, which includes X- and gamma rays, is considered carcinogenic. This biological ability to break DNA strands, cause mutations, chromosomal aberration and cell damage is used in external beam radiotherapy . In the head and neck area, however, this adverse carcinogenic effect has not been as clear .[5]

Case studies in literature have shown that irradiated cases have formed new laryngeal or laryngopharyngeal malignancies and explanations for radiation induced carcinogenesis suggested that supervoltage radiation directed to the laryngeal mucosa may produce second primary carcinoma.[4]

There is evidence in literature showing that radiation induced second primary laryngeal carcinoma occurs at the interval of 5–18 years (mean 9.9 years) between the primary and recurrent cancers. All the second cancers were found in the previously irradiated area, late recurrences are extremely rare and histological examination clearly shows that the second carcinoma originates from the squamous epithelium and not from dormant nests in the deeper layers of the vocal cord [3].There is association between the sites of primary and second tumor[8].

The incidence of second primary malignancies occurring after radiotherapy were reviewed in studies and cumulative incidence of SPM was as high as 20% and SPM observed in tissues having absorbed more than 2 cGy,the incidence increases with dose.[6]

There are studies explaining about other second primary head and neck cancer following radiotherapy like in cases of lymphoma. Progress of therapeutic modalities in recent decades have considerably improved the prognosis of malignant lymphoma, on the other hand, development of therapy-related second cancer as a late complication of treatment has became obvious [12-15]. The risk of Head and Neck cancers have significantly increased after radiotherapy for early-stage Non Hodgkins Lymphoma.[16]

The use of re-irradiation in patients with locoregional recurrence of head and neck cancer may have a higher probability of achieving local control than other treatments.[11] There is also evidence in literature stating appearance of carcinoma in the postcricoid and hypopharyngeal regions from 7 to 12 years after successful therapeutic irradiation for carcinoma of the endolarynx.[17]

Recommendation

In many countries, recommendations on screening for SMN have been issued for selected high-risk survivor groups. However, most guidelines are consensus- rather than evidence-based. Therefore, research is needed on the diagnostic value of screening tests in this specific population and the ultimate effect of screening on mortality. Effective screening is only possible with better understanding of the pathogenesis of treatment-related SMNs.[7] Currently, such knowledge is lacking, so there is a strong need for studies investigating the mechanisms by which different treatments affect SMN pathogenesis, the clinicopathological characteristics of treatment-related SMNs and their prognosis.

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