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Review

Re-irradiation for head and neck squamous cell carcinoma

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KEYWORDS

Squamous cell carcinoma;
Recurrent;
Re-irradiation;
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Abstract *Introduction:* Local recurrences after curative treatment have a potential for cure with salvage surgery or with re-irradiation.

Methods: We reviewed the PubMed for articles published in English with key words squamous cell carcinoma, recurrent, re-irradiation, prognostic factors to find relevant articles describing prognostic factors, re-irradiation, and outcome for recurrent head and neck squamous cell carcinoma.

Results: Various factors including age, performance status, time for recurrence, previous radiation dose volume and site of recurrence, previous use of chemotherapy are all prognostic factors in recurrent head and neck squamous cell carcinoma. Surgery is feasible in very select subgroup of patients and must be done when feasible. Re-irradiation with the aid of modern sophisticated technology is safe and confers durable and clinically meaningful survival benefit. Re-irradiation in head and neck recurrent squamous cell carcinoma may provide an expected median survival of 10–12 months. Chemotherapy may be added along with radiation in the recurrent setting.

Conclusion: Treatment approaches may have to be personalized. Re surgery must be done in all patients in whom it is feasible. In patients in whom surgery is not feasible, re-irradiation must be evaluated as a therapeutic option especially in patients with limited volume recurrence.

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Introduction

Head and neck squamous cell carcinoma (HNSCC) is the sixth most common cancer globally [1]. The advances in surgical and radiotherapy techniques have contributed tremendously toward improved outcome with less morbidity in these patients [2]. Despite the advances in the last two decades, 35–40% of patients recurs locally or loco-regionally and poses a significant health burden. Second primary cancers in the head and neck region further add to this burden, which can be as high as 20–25% in a long term [3]. The treatment of recurrent/second primary HNSCC is always challenging and is associated with significant morbidity [4]. A balance has to be achieved between local control and treatment related morbidity and mortality. Salvage surgery alone has yielded dismal results as has systemic chemotherapy alone [4,5–8]. Median survival with both these approaches has ranged from 5 to 9 months. In addition, many patients are found unsuitable for surgery because of disease extent or morbidity associated with such approach. Re-irradiation of such cases has been tried in the recent practice with promising results. Understanding of the molecular biology and genetic aberrations has paved for newer targeted drugs and are being increasingly tried for the treatment of such cases. However, there is limited prospective data about the management of recurrent/second primary HNSCC (rHNSCC). Hence, management of these tumors varies widely across institutes and based on local perception, available resource. The non-availability of prospective data also precludes comparing one modality to the other and finds the optimum based treatment option. In this review we intend to look into current status of re-irradiation for the treatment of recurrent/second primary HNSCC (rHNSCC).

Search methodology

We performed a comprehensive search of the PubMed, SCOPUS and Google Scholar with the following MesH terms: “reirradiation in head and neck cancer, radiation in recurrent head and neck cancer, reirradiation AND recurrent head and neck cancer AND treatment, survival” to find all possible publications pertaining to rHNSCC. We also conducted a detail

search of the references in the available article to retrieve missing articles and conducted a hand search in Google to find any possible publication. After a thorough search the duplicates were removed and the remaining articles were looked into detail.

Investigations

As patients with local or nodal recurrence would undergo a salvage surgery or salvage re-irradiation it is important to rule out any other site of disease that is not evident clinically. An indirect laryngoscopy and upper gastrointestinal endoscopy must be done in all patients and suspected abnormal areas must be biopsied. A contrast enhanced magnetic resonance imaging (MRI) of the head and neck may be superior to contrast enhanced computed tomography (CT) depending on the tumor subsite and tumor extensions. Soft tissue delineation of the disease may be better appreciated in an MRI than a CT. In addition the perfusion and diffusion-weighted MRI helps in differentiating recurrent cancer from post radiation changes [9]. PET scan also is of great help in this scenario and is associated with a high predictive value in patients with recurrence post chemoradiation [10].

The need for a re-biopsy is sometimes debated in a recurrent head and neck cancer patient. It may be avoided in some patients in whom recurrence occurred early and have a diffuse metastatic disease that is clinically correlating with the natural course of the disease. This is particularly important in these patients due to the field cancerization phenomenon that occurs in head and neck cancers [11]. It is also of significance as the patient might have developed a radiation induced second primary which is usually a sarcoma, which should be salvaged surgically [12,13].

Prognostic factors in recurrent Head and neck squamous cell carcinoma

Prognosis with salvage treatment depends on disease related factors or treatment related factors. Balancing toxicity and disease control becomes an important issue in re-irradiation. Disease related factors are site of recurrence, previous response

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