

Case report

Radical radiotherapy for early laryngeal cancer in a patient with human immunodeficiency virus: no evidence of increased toxicity

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Abstract. There are very few reported cases of laryngeal squamous cell carcinoma (SCC) in patients with a background of human immunodeficiency virus (HIV) infection. We report a case of a 42-year-old man who developed a T2 N0 left vocal cord well differentiated SCC with an 11 year history of HIV infection. He successfully completed a course of radical radiotherapy 66 Gy in 33 fractions over 47 days. During his treatment he experienced only a grade 1 Radiation Therapy Oncology Group (RTOG) acute toxicity reaction to the larynx and no weight loss. At 32 months follow up he remains disease free and has no significant late morbidity. Prior to his radiotherapy his CD4 count was 350 cells mm⁻³; we discuss the view that the treatment chosen needs to be individually tailored with respect to the patient's immune status.

Squamous cell carcinoma (SCC) of the larynx is uncommon in patients under the age of 45 years and only approximately 3% of cases occur in this age group [1]. It has been postulated that there is an increased incidence in human immunodeficiency virus (HIV) positive patients [2] and that these tumours may be more advanced and aggressive [3], and that this may relate to an impairment of the normal immune surveillance mechanisms secondary to HIV. Many HIV infected individuals are co infected with other immunomodulatory viruses, *e.g.* cytomegalovirus (CMV), Epstein-Barr virus (EBV), human T-cell lymphotropic virus type 1 (HTLV-1) and human papilloma virus (HPV), which may also affect the development of malignancy and response to therapy. The published data on management of SCC in the head and neck and HIV is scanty but it been reported that there is increased toxicity in patients undergoing chemoradiation for SCC in the anal canal when HIV is present [4]. The decreased immune function may also make recovery post-surgery more problematic so treatment decisions in these patients are difficult. The following report concerns a case of SCC of the larynx in a patient with HIV managed by definitive radiotherapy.

Case report

A 42-year-old white male presented in June 2000 with a 3 month history of a hoarse voice. On microlaryngoscopy he was found to have a T2 lesion on the posterior quarter of the left vocal cord spreading to the subglottis. There was full mobility of the vocal cords. Biopsy showed this to be a well-differentiated keratinizing SCC. He had previously been diagnosed with HIV in 1989 and been on various antiviral treatments since 1991. He had a past

medical history of syphilis infection 1982, acute hepatitis B 1987, herpes zoster 1990 and 1993, recurrent oral candida and herpes simplex type 1, recurrent bacterial chest infections and asthma. His anti-viral treatment at the time was combivir, efavirenz and acyclovir and he was also taking combivent and ventolin inhalers. His viral load was less than 50 (copies per ml) and his latest CD4 count was 350 cells mm⁻³. He had smoked 20 cigarettes per day for 25 years and drank approximately 30 units of alcohol per week. He was otherwise very well with a Karnofsky's performance status (KP) of 90. The treatment options of radiotherapy and surgery were discussed with the patient in the multidisciplinary clinic and the decision was made to treat with radical radiotherapy.

Radiotherapy technique

The patient was treated with radical external beam radiotherapy using 4 MV photons. He was treated with a lateral wedged parallel opposed pair at 100 cm surface-to-skin distance with a fixed field size of 5.5 cm long by 5 cm wide and received 66 Gy to the midline in 2 Gy once daily fractions over 6 and a half weeks. We decided to use a longer conventional fractionation (compared with our standard 3 to 4 weeks) in order to monitor acute toxicity during a significant proportion of the treatment course. He was reviewed weekly and fibre-optic laryngoscopy was performed at each visit to monitor the acute reaction and disease status. This would have enabled us to curtail the treatment early if any exaggerated acute reaction had occurred.

Results

The radiotherapy was completed without interruption resulting in grade 1 erythema; the patient continued to

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smoke throughout his treatment. The mild acute reaction was controlled with paracetamol mucilage, mucaïne and aspirin with papaveretum. On weekly laryngoscopy the only reaction visible was erythema over the false cords, which developed after 16 fractions and continued for the duration of the radiotherapy. He managed a soft oral diet throughout his treatment and maintained his original weight.

On review 1 month after completion of radiotherapy the vocal cords appeared clear and the radiotherapy reaction had completely resolved. 32 months later there is no sign of recurrence. He still continues to smoke.

Discussion

There has been remarkable progress in treatment for HIV infected patients and those who present with malignancy are often likely to survive longer than in the past. Most of the literature on radiotherapy in patients with HIV concerns SCC of the anus and lymphoma. In head and neck cancer the majority of information concerns kaposi's sarcoma of the oral cavity. An increase in acute mucosal toxicity has been reported in HIV patients with oral kaposi's sarcoma treated with radiotherapy at doses of only 10 Gy to 18 Gy in 1.5–3 Gy fractions [5]. This may be due to the presence of the HIV virus or to the kaposi's sarcoma itself. It has also been reported that patients become more radiosensitive as their disease progresses [6] and it has been postulated that this may be due to falling levels of glutathione, which may protect against the free radical damage caused by radiation [7].

The CD4 (T-helper cells) count is felt to be important and is thought to be linked to the development of the patient's acute radiotherapy reaction. The HIV virus infects CD4 cells and eventually destroys them, so the number of T-helper cells gradually decreases as the disease progresses. The normal CD4 count in adults ranges from 500 to 1200 cells mm⁻³ and is a marker of the level of a patient's cell-mediated immune function. Published data suggest that HIV patients with a CD4 count of less than 200 cells mm⁻³ experience increased therapy related acute toxicity when treated with chemoradiation for anal cancer [8]. Our patient's CD4 count of 350 cells mm⁻³ was above this level and in view of this it was decided to treat him radically. There is little data on what dose can be safely tolerated but a paper published in 1999 reported 3 cases of SCC head and neck in patients with HIV treated with

radical radiotherapy doses ranging from 50 Gy to 71 Gy in 2 Gy fractions. The radiotherapy was shown to be well tolerated and at least at partial response was achieved in all patients [9]. It was therefore elected to treat our patient with standard curative radiotherapy in 2 Gy per day fractions to 66 Gy to allow time for modification of dose if an excessive acute reaction occurred. This may not have been possible with shorter regimens because the acute reaction tends to occur towards the end of the treatment course.

Conclusion

The grade 1 RTOG acute reaction and excellent response to treatment seen in this patient provides more evidence suggesting that patients with HIV and a good performance status can be safely treated with standard radical radiotherapy if the CD4 count is over 200 cells mm⁻³.

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