

Management of head and neck radiation therapy complications

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Abstract

Cancer is considered a public health problem and affects thousands of people around the world. The incidence of head and neck cancer has been increasing and this disease causes serious damage to the patient, mainly due to the location of the lesions.

Treatment consists of surgery, when it is possible, radiotherapy and chemotherapy. This combination has serious consequences for the patient, many complications resulting from this treatment. Surgery can leave irreparable sequelae, radiotherapy causes serious damage not only to cancer cells, but also to healthy cells, which can lead to complications such as: radiation caries, xerostomia, mucositis, candidiasis and osteoradionecrosis. In this review, the main forms of treatment for these outcomes that are so harmful to patients will be addressed, affecting not only the treatment as a whole, but their quality of life.

Introduction

Head and neck cancer (HNC) is used to describe a group of several malignant tumors in the upper part of the aero digestive tract, covering at least 30 diseases, according to the World Health Organization (WHO) [1]. A common site of occurrence is the oral cavity, with more than 40% of cases. Other common sites for the primary tumor include the pharynx, larynx, nasal cavity and paranasal sinuses. Squamous cell carcinoma being the most prevalent [2].

Patients who are undergoing treatment for head and neck cancer, can be treated through surgery, to remove the tumor, with safety margins, chemotherapy, as an adjuvant and radiotherapy, which damages normal cells, especially those that are less able to repair the damage caused [3]. In the oral cavity, these cells can be from the mucosa, underlying tissues, tooth, periosteum, bone, glands and vessels, resulting in specific radiation complications, of which the following stand out: radiation caries, xerostomia, mucositis, candidiasis and osteoradionecrosis [4].

These patients need specific care, not only after radiotherapy, but before, where an adequacy and preparation of oral health must be carried out, during, where one seeks to alleviate or minimize the consequences of treatment and after, where the quality of oral health is maintained, and the control of the sequelae resulting from the treatment is made [5]. Therefore, the present study aims to make a review on the management of these patients who have complications of head and neck radiotherapy.

Radiation carie and xerostomia

They are complications, with varying prevalence, from 20 to 70% depending on the type of study and are closely linked. Xerostomia causes functional problems in the oral cavity, affecting speech and taste, in addition to causing difficulties in chewing and swallowing. In addition, hyposalivation increases the risk of developing infections

such as candidiasis, gingivitis, in addition to increasing the risk of radiation caries [4].

Systemic care to prevent xerostomia only occurs in research. The most appropriate conduct begins with good oral hygiene, which decreases the effect of dry mouth and its consequences. Salivary substitutes are used to relieve symptoms, such as artificial saliva and constant mucosal irrigation. sialogues like chewing gum are also used to stimulate salivary glands [6].

Radiation caries is a unique, rapidly progressing disease that can be seen within several months of starting treatment, is painless and affects teeth that are normally resistant to caries, such as incisors. They usually start in the cervical areas and progress through the entire crown of the tooth, leaving it fragile [7].

To act in the treatment of radiation caries, the dental surgeon must understand that he may face additional difficulties such as trismus and dental fragility itself, caused by the destruction of its structure [3].

Some studies indicate that alterations induced by radiation, in the enamel and dentin, can compromise the bonding of adhesive materials, although there is still no consensus [8]. Glass ionomer cements (GICs) enjoy simpler bonding procedures and good chemical adhesion, in addition to the release of fluoride, which can reduce recurrent caries. Some studies have pointed out the effectiveness of this material, showing significantly less recurrent caries, so they should be

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the material of choice for restorations, which can be conventional or resinous [9].

Mucositis

Oral mucositis is one of the most significant and prevalent complications of the treatment of HNC [10]. Pathogenesis is complex and is also related to xerostomia. It can occur during and after treatment, with effects that can vary from severe pain, difficulties in eating and performing oral hygiene, compromising quality of life and can even lead to suspension of cancer treatment, increasing the risk of death [11].

Mucositis may appear with erythema in its initial manifestation, followed by scaling white plaques, which can turn into ulcers, causing severe pain [12]. The most affected regions are the buccal floor, lateral border of the tongue, buccal mucosa and palate [13]. Difficulty in hygiene due to pain and lack of follow-up can worsen the condition [14].

Many interventions have been tried, which have some positive effects in the treatment of oral mucositis. Of which stand out: aloe vera, amphotericin antibiotic pastille / paste and sucralfate, laser and even cryotherapy, with ice application, that can cause some relief in symptoms [15].

The use of codeine can be useful as intermediate pain relievers. It is likely that the worsening of symptoms requires strong opioids such as morphine [5]. A study carried out in Brazil, using propolis gel, obtained excellent results, both in decreasing prevalence and in relieving symptoms of mucositis, but additional studies must be carried out to better support this evidence [16].

Candidiasis

Patients undergoing radiotherapy have a higher prevalence of oral candidiasis. It is an opportunistic infection, produced by fungi of the genus *Candida* (*candida* spp.) [17]. Oral candidiasis can be categorized into three types. Pseudomembranous oral candidiasis is characterized by the appearance of white moss, erythematous oral candidiasis by the eruption of erythema, and hyperplastic oral candidiasis by mucosal hyperplasia. Symptoms may be absent or include burning pain, difficulty swallowing, dysgeusia and halitosis. The diagnosis of oral candidiasis is fundamentally clinical, microbiological techniques are used when the clinical diagnosis needs to be confirmed and biopsies, in turn, are more indicated in patients with hyperplastic candidiasis [18].

Persistent candidiasis can be treated with antifungals. There is evidence to suggest that nystatin should not be used at the same time as chlorhexidine, as they may inhibit the action of the other. Should use occur, at least one hour apart [5]. Systemic ketoconazole may also be effective. Care with oral hygiene is also important in its prevention, as well as in the use of salivary substitutes, avoiding alcohol and smoking. Treatment may also include topical miconazole and fluconazole, available at. When systemic therapy, the first line medication is oral fluconazol [3].

Osteoradionecrosis

It is one of the most serious and important complications resulting from radiotherapy treatment, occurring mainly late. Initially, it appears as asymptomatic bone changes, such as decreased bone density, delayed healing and destruction of the cortical bone, in addition to ulcers and oral fistulas. Pain, stench and difficulty in chewing are also found [19].

Preventive measures are the best way to fight osteoradionecrosis. For this reason, the adequacy of the oral environment and the preparation of patients before the beginning of radiotherapy is essential, where teeth with problems and possible complications are removed. Broad-spectrum prophylactic antibiotics also help prevent [5].

Hyperbaric oxygen is used to increase the blood-tissue oxygen gradient, which enhances the diffusion of oxygen into hypoxic tissues. The increase in oxygen supply stimulates fibroblast proliferation, angiogenesis and collagen formation. HBO therapy (HBOT) involves breathing oxygen under increased atmospheric pressure in a specially designed chamber [20]. Some studies indicate this method as effective in combating osteoradionecrosis.

More recent treatments indicate good results with the synergy between pentoxifylline (PTX) and tocopherol (vitamin E). Antioxidant agent PTX, facilitates microcirculation, and inhibits the inflammatory mechanisms, promotes fibroblast proliferation and the formation of extracellular matrix. Tocopherol protects the cell membrane against peroxidation. These are accessible, well tolerated and safe drugs [21].

Conclusions

Complications resulting from radiotherapy are varied and aggressive. There are several methods to prevent and treat these diseases. In many cases, they are just palliative therapies, to relieve pain and more serious symptoms. The main objective in the care of these patients is to maintain a good quality of life and support the continuation of therapy against cancer. Many patients have to abandon therapy if proper management is not carried out. Prevention and dental care before, during and after radiotherapy are essential for successful care with these patients.

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Authorship

Author IFP contributed in the planning, literature review and writing. BCdoEV contributed with critical review, read and approved the final manuscript.

Conflict of interest

No.

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