Other full case

Management of trismus following radiation therapy by cost-effective approach

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Summary

Radiotherapy when used in head and neck cancer treatment can produce side effects in patients such as the trismus. If allowed to progress trismus can become so severe that the patient becomes debilitated due to lack of nutrition. Furthermore, trismus and limited oral access present a challenge to the clinician for dental treatment. This article describes a simple and cost-effective appliance for management of trismus.

BACKGROUND

Trismus is a prolonged spasm of the jaw muscles by which normal opening of the mouth is restricted.¹ Trismus patients may experience a marked restriction of jaw movements which can hamper overall physical and mental health of the patient. Trismus can be caused by trauma to head and neck region, inflammation of muscles of mastication, masticatory space infection, pericoronitis, impacted third molar, temporomandibular joint disorders, oral submucous fibrosis, tetanus, ankylosis of temporomandibular joint, as a complication of local anaesthetic injection, connective tissue diseases, radiation therapy of head and neck region, drugs and tumour growth, etc.²⁻⁵

Normal interincisal distance is 40–45 mm at maximum mouth opening. Diagnosis of trismus is made when maximum interincisal distance (MID) is less than 40–45 mm. In dentulous patients it is measured between the incisal edges of maxillary and mandibular central incisors. For edentulous patients, the distance is measured between the maxillary and mandibular alveolar ridges.⁶ Following radiotherapy, trismus results mainly due to fibrosis of muscles of mastication. This fibrosis is not apparent immediately following radiation treatment but occurs progressively as mucositis subsides. Severity of trismus is dependent on the radiation source, dose and number of fields radiated.⁷⁻⁸ The clinical management of trismus includes different approaches according to patient's condition, for example, surgery, forced opening of mandible, use of opening devices and modification of prosthesis.⁹⁻¹⁰ This article describes a management of post radiation trismus.

CASE PRESENTATION

A 65-year-old patient suffering from squamous cell carcinoma of the palate on the right side was referred to the department of prosthodontics for fabrication of surgical obturator. Surgical obturator was fabricated and given following surgery to restore the palatal integrity and to reduce oral contamination of the wound during the postsurgical period. Subsequently, the patient was kept on radiotherapy which caused severe trismus leading

to interincisal opening limited to 6 mm approximately (figure 1A). The limited mouth opening profoundly diminishes the quality of life due to inability of speech, mastication and deglutition. Thus, the patient was treated with a threaded taper shape appliance fabricated from self-cured acrylic resin to increase mouth opening to restore normal oral functions (figure 2).

Figure 1. Clinical photographs of the patient. (A) Pretreatment and (B) post-treatment after 2 weeks.

Figure 2 Trismus appliance.

TREATMENT

First, the appliance was carved in modelling wax and impression of the whole wax up was taken in putty material by applying a layer of putty around it and putty was supported by a layer of dental stone. After the stone has set, the wax up was removed. After this mould for fabrication of appliance was ready, subsequently, autopolymerising resin was poured by sprinkled on method into the mould. A 'T'-shaped handle was attached to the device so that the patient can rotate it. The device was pulled out from the mould as the resin was polymerised. Finishing and polishing was done in usual manner.

The patient was advised to place the smaller end of the tapered appliance between premolars and rotate the appliance clockwise using the handle. This made the appliance push more lingually and gradually mouth opening was increased. The patient was advised to do this exercise twice to thrice daily.

OUTCOME AND FOLLOW-UP

After 2 weeks, the patient was reported with increased mouth opening (14 mm approximately) and was motivated to continue exercise (figure 1B).

DISCUSSION

Trismus can be severe following surgical procedures or radiation therapy to the head and neck. Correction of trismus by surgery is routinely done to eradicate post-operative sequelae. But, second surgery in cancer patients to relieve trismus is generally avoided because history of radiotherapy in the area, refusal to undergo surgery and financial constraints. Forced opening of mandible as a corrective procedure for trismus can have painful and serious complications. It requires general anaesthesia, as the

procedure is extremely painful and furthermore, employing general anaesthesia itself is a hazardous task to perform as the immobile mandible makes blind intubation necessary.

Several methods have been utilised to counteract trismus and increase interarch space. Prevention is the best treatment for trismus following radiotherapy. When the major muscles of mastication fall within the field of irradiation, trismus is always anticipated. The patient should be encouraged to do jaw exercise daily to maintain maximum mouth opening and maximum jaw mobility. An increasing number of tongue blades can be forced between the anterior teeth, acting both as a wedge and as a visual gage to the degree of opening. When trismus is severe, an attempt can be made to increase the oral opening with a 'dynamic bite opener'.¹⁰ This device is constructed from two stainless-steel rods welded to the sides of an arch-shaped stainless-steel plate. The occlusal surfaces of the teeth are indexed on the metal plates with a thin layer of autopolymerising acrylic resin. The rods are bent and elastic bands are used to activate the device. Use of the 'opener' for 20 min intervals to restretch fibrosed tissues can result in a more normal oral opening. Once the desired opening is reached, it is maintained with jaw exercises and occasional use of the 'bite opener'. The present method utilises a threaded, tapered screw made of acrylic resin. The patient places the screw between his posterior teeth and gradually turns it to wedge his teeth apart. The threads guide the teeth along the increasing taper while the patient controls the timing and degree of pressure required to gradually increase the jaw separation. This method is simple and cost effective as compared to other methods and it was easy for the patient to use the appliance. Patient motivation is the key factor in this kind of appliance success.

Learning points

- ▶ The side effects of radiation therapy to the head and neck are trismus which subsequently leads to reduced mouth opening, difficulty in mastication and speech.
- ▶ Reduced mouth opening also compromise the dental treatment due to poor accessibility.
- ▶ The appliance improved the quality of life by eradicating post-treatment sequelae.
- ▶ The appliance was simple and cost effective as compared to other methods of trismus management.

Competing interests None.

Patient consent Obtained.

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