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Case Report

Implant Treatment for the Patients with Severe Deep Bite Using Screwed Denture: Technical Note

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Abstract

The purpose of this article is to report an innovative technique for an increase vertical dimension with screwed denture fixation and intravenous sedation for the patients with severe deep bite.

Bite raising is essential to maintain a long term stability of occlusion in the case of implant treatment associated with severe deep bite.

Generally, a removable denture is used to increase occlusal vertical dimension for the first step of oral rehabilitation in the case of severe deep bite. However, these patients sometimes fail wearing removable denture for increasing vertical dimension, because of severe discomfort.

On the other hand, an intravenous sedation is advantage that the patients fall asleep and is completely unaware of the procedure being performed.

Therefore combination screwed denture fixation and intravenous sedation allowed to raise occlusal vertical dimension in implant treatment.

In conclusion, this combined method using screwed denture and intravenous sedation are the most promising technique for implant treatment to raise the vertical occlusal dimension for the patients with severe deep bite.

Keywords: Severe deep bite, Screwed denture, Bite raising, Implant fracture.

Introduction

In recent years, various complications of implant treatment have been reported, as they are often performed in many dental clinics [1-3]. One of complications in dental implant treatment is fracture of implant components including superstructure and abutment-superstructure intersurface [4,5]. Metal fatigue and biomechanical overload derived from deep bite could be most common cause of fractured implant components [4,6-9]. Therefore successfully treating a severe deep overbite must be a major challenge for long stability of implant treatment [4-8].

Methods

Five patients with severe deep bite (3 males and 2 females) underwent this technique described the below, as pre-implant procedure to raise bite. The average age of the patients was 68.5 years.

Case

A 71-year-old man visited our hospital with a chief complaint of implant treatment.

He has had the difficulty of chewing for a long time, however, he was refused by many hospitals because of failed wearing removable denture for increasing vertical dimension. In clinical examination, facial view revealed convex profile, and a reduction of the lower one third facial height. Mouth opening was 40mm without murmur in the temporomandibular joints. Intraoral view revealed severe deep bite, overjet +7mm, overbite +10mm, especially, the maxillary molars were in contact with the mandibular molar gingiva (Figure 1) Immediate

partial denture was designed and made by diagnostic wax-bite at laboratory, predictively using the mandibular rest position (Figure 2).

Figure 1: Preoperative intraoral view showing overjet +7mm and overbite +10mm.

Figure 2: Predictive the immediate denture. Bite raising in Articulator

Technique

In adults, the initial dose of midazolam is 2mg given intravenously before the beginning of the procedure (Figure 3). Further doses of 1mg of midazolam may be given as necessary. Total dose have been found to range from 3.5 to 6.0 mg.

6 teeth were simultaneously extracted and prepared immediate denture was placed and fixed with 11mm-long screws in 3-4 places in the maxilla and mandible under intravenous sedation. The space between extraction socket and denture floor were filled with tissue conditioning material for suitable fitness to prevent food impaction. Moreover, this denture was screwed into the alveolar bone through the gingiva, so that the patient cannot remove by himself (Figure 4).

This fixed denture using screw was removed one week later, after the occlusion could be stabilized (Figure 5). All extraction sockets were healing without ulceration, pain, infection and wound dehiscence.

Figure 3: Intravenous sedation with midazolam.

Figure 4: Denture placed with screws under intravenous sedation

Figure 5: Screws penetrated from denture.

Results

The postoperative course has been uneventful for 6 weeks since then. As the result, adequate clearance was ensured by placing immediate denture using screws and implants could be placed (Figure 6). Intraoperatively and postoperatively, the patient had no discomfort and pain by means of intravenous sedation. It has achieved excellent clinical results without any complications, including temporomandibular joint problems. All 5 patients were satisfied with the result of this procedure.

Figure 6: Panoramic radiograph after implantation

Discussion

Generally, in the case of severe deep bite, a removable denture is used to increase occlusal vertical dimension for the first step of oral rehabilitation. However, they could fail wearing removable denture for increasing vertical occlusal dimension, because of severe discomfort. Occasionally they do not get used to wear the denture due to severe discomfort and vomiting reflex. Therefore, bite raising for severe deep bite must be challenging [3-8].

Sedation plays an important role for daily surgical procedures under local anesthesia. These procedures are often associated with fear of pain, preoperative anxiety, and treatment-related mental stress. Anxiety caused by surgical procedures varies from a suppressed fear of pain to dental phobia which may make treatment impossible [10-13]. Midazolam has excellent anxiolytic qualities and is a well-established premedication agent. Therefore, midazolam is widely used for intravenous sedation before surgical procedures. It has depressant effects on the central nervous system with rapid effect and few adverse events [10,11,13]. Consequently, intravenous sedation with midazolam is advantage that the patients falls asleep and are completely unaware of the procedure being performed [11,12]. In addition, bite taking performed under an intravenous sedation is easier than that performed under general anesthesia. Because the patient is sitting on the chair and operator can perform bite taking while speaking to the patient.

The application of screws to denture is simple, easy and time-efficient technique [14-16]. It is also easy to maintain proper postoperative oral hygiene. The technique is not dependent on the number of remaining teeth and can be performed under local anesthesia. The holes for screws should be drilled with bar, just after the dentures are placed in planned position, following by the length of the screws should be selected by the

thickness of the alveolar bone. The screws should not perforate the palatal or lingual mucosa, and be only placed in the alveolar bone, confirming stability of screws and denture. Timing of screws removal was adequate after one week of fixation.

One more key of success is to make the patient wear this screwed denture all day long for one week. For the meantime, the patients get used to it and can wear it in daily life.

In conclusion, this method using screwed denture fixation and intravenous sedation are promising technique for implant treatment that raises the vertical occlusal dimension.

Further study is necessary to clarify the efficacy of establishment functional occlusion and long term of occlusal stability, including adaptation of the temporomandibular joints.

Declarations

We have no conflicts of interest.

We obtained written consent for publication of the photograph. No ethical approval was required.

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