CASE REPORT

A simple and inexpensive retainer for overdenture prosthesis

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lakshya79@yahoo.com**SUMMARY**

This article describes a clinical case report of a 65-year-old male patient in which an overdenture was fabricated by using a simple, logical and inexpensive means of retentive device. The described mandibular overdenture involves a simple modification in the coping design and a wire lock mechanism which was fabricated during denture processing. The problems associated with copings were overcome by putting the patient on a regimen wherein topical fluoride was applied every week on the abutment. The denture, fabricated involving a wire lock mechanism, was highly retentive and stable. Patient was highly satisfied with the outcome of the treatment.

BACKGROUND

The dental profession has expanded the preventive dentistry concept into prosthodontics, to bring about the prescription called 'The Overdenture'. Preventive prosthodontic principles emphasise the importance of any procedure that can delay or eliminate further prosthodontic problems. The overdenture is a logical method for the dentist, to use in preventive prosthodontics even when few natural teeth are remaining. Many studies have also reported significant reduction in mandibular bone loss with the use of overdentures.¹⁻² The advantage of retaining the roots even when few in number are directional sensitivity, dimensional perception, proprioception, salivary secretion, tactile sensitivity to load, periodontal ligament support, improved occlusal force and chewing efficiency.³ A patient wearing an overdenture also has increased speed of controlled mandibular movements.

The problems associated with overdenture treatment are usually caries and periodontitis of the abutment teeth which support it.⁴⁻⁷ An important aspect of using copings for overdenture is the proper case selection. It is important for long-term success of the prosthesis that, the patient is highly motivated and educated about the preventive measures to be taken to prevent caries and periodontitis of the prepared abutment. Because the overdenture covers the abutment and the potential of salivary buffering is reduced, the risk of caries is increased.

CASE PRESENTATION

A male patient, aged 67 years, came to the outpatient department with a difficulty in mastication owing to loss of natural teeth. Medical history revealed a history of long-term diabetes and patient was on oral antidiabetic drugs. Oral examination revealed presence of maxillary and mandibular

Figure 1 Intraoral view showing the remaining natural tooth.

canines and mandibular left first premolar. The teeth were worn down as a result of attrition (figure 1). The remaining natural teeth were supraerupted. The treatment plan included oral prophylaxis of the remaining natural teeth, followed by root canal treatment, which was supposed to be followed by an overdenture with coping. The problem that was mainly anticipated was the retention of the prosthesis with only three abutments present in the mandible. To overcome the problem of retention and support, an innovative yet simple technique, using a wrought stainless steel wire with a modified cast coping has been used.

TREATMENT

After assessing the success of the root canal treatment, the access openings were closed using silver amalgam. The natural teeth were prepared to receive a metal coping. A chamfer finish line was incorporated at the margins (figure 2). After the preparation

Figure 2 Prepared abutment teeth.

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Figure 3 Conventional maxillary coping and modified mandibular coping cemented in place.

of the teeth, alginate primary impressions of maxillary and mandibular arches were made. The primary cast was poured and special tray was fabricated for both maxillary and mandibular arches.

Border molding was performed for maxillary and mandibular arches and a final impression was made using a combination of medium and light body. The impressions were poured using die stone and individual dies were prepared on which a wax pattern was made for the respective copings. Mandibular copings were modified so as to create an undercut within the coping (figures 3 and 4). This modified coping would allow incorporation of a wrought wire lock mechanism that would be present within the denture. After the copings were cast, they were first tried on the respective abutments and then cemented in place using type-1 glass ionomer cement.

Routine procedure for fabricating the complete denture was followed till processing. During denture processing the wrought wire lock mechanism was fabricated by adapting a straight piece of 19 gauge stainless steel wire into the undercut areas of the two respective copings (figure 5). The wire lock has a horizontal portion which runs across from one coping to another like a bar, when viewed occlusally. This portion then runs back across the neck of the copings towards the lingual surface. At this time the wire should be extended just 2 mm across the neck of the coping. After the wire lock was ready, it was fastened to the cast with a cyanoacrylate adhesive, so that position of the wire lock remains stable, during packing of the heat cure acrylic resin. The regular procedure of the denture processing was carried out till the processed denture with the wire lock was retrieved (figure 6).

Figure 4 Master cast showing the frontal view of the undercut present in the coping.

Figure 5 Wrought wire adapted within confines of the prepared coping.

OUTCOME AND FOLLOW-UP

The denture was inserted and the patient was given regular instructions regarding maintenance of oral hygiene, the usual clinical regimen for overdenture patients, is to have them put one drop of a neutral fluoride gel in the depression corresponding to the abutment after brushing and before seating the denture in the mouth. The patient is asked not to eat or drink anything for at least half an hour. The success of this practice relies on patient's compliance and salivary flow rates. The patient was advised for the 24 h, 1-week, 1-month and 6-month recall visits and asked him to tighten the wire lock if he feels that the prosthesis is losing retention during function.

DISCUSSION

The modified coping that is cemented on the mandibular remaining natural canines, provides an excellent means of retention and stability for the prosthesis. Ideally for an overdenture, at least four teeth should be present in a quadrilateral arrangement, but when one has to preserve the residual alveolar ridge, even two or three teeth can be used to aid in retention, support and stability for the prosthesis. The undercut provided in the mandibular coping was kept to only 0.02 of an inch which was developed by using the undercut gauge of a dental cast surveyor.

Figure 6 Processed complete denture with wire lock mechanism.

The wire should not be incorporated within the acrylic on the lingual side as it will decrease the flexibility of the wire. It would also lead to coping cementation failure after prolonged use by the patient. It should have just enough length so that it can lock into the coping without being too rigid.

The susceptibility of overdenture abutments to dental caries has been identified as one of the main problems associated with the use of overdentures. Studies have also shown that simply brushing the overdenture abutments is not sufficient to prevent caries.^{5 6 8}

Learning points

- ▶ A wire lock with a modified coping is an excellent means of retentive and supportive device that can be incorporated in situations where there are less teeth present for an overdenture.
- ▶ The overdentures have better stereognostic response than the complete denture so it provide superior chewing ability and precise jaw movements than complete denture.
- ▶ The orthodontic wire which is used in treatment is economical and very easy to fabricate.

Contributors All authors were involved in formulating the treatment plan and the writing of manuscript.

Competing interests None.

Patient consent Obtained.

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