Management of overdenture abutments health by an innovative cleaning aid

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SUMMARY

This article describes a method for fabrication of a custom-made device for cleaning dome-shaped overdenture abutments. A kid toothbrush and a rubber cup were used for fabrication of a prophylactic device. After regular use of this device periodontal health status of the overdenture abutments patients improved satisfactorily.

BACKGROUND

Mandibular bone loss was significantly reduced in overdenture patients as compared with people wearing conventional complete dentures.¹ Preservation of alveolar bone, sensory proprioception, improved support and stability are various advantages of retaining teeth and using them as overdenture abutments.² Better control over mandibular movement, improved chewing efficiency and increased occlusal forces are generated with overdentures as compared with conventional complete dentures.³ Caries and periodontal disease are major problems associated with overdenture abutments.

Toolson and Smith showed that simply brushing the overdenture abutments alone was not sufficient to prevent caries.⁴ The conventional toothbrush that is used regularly by dentate patients will not serve the purpose of cleaning the dome-shaped overdenture abutments. Moreover, the large head of the brush can traumatise the gingiva adjacent to the abutment. The requirement of such patients is a soft bristled brush with a small head, as well as some aid for cleaning the sulcular area, which the large-headed regular brush cannot access. This article describes an innovative method for fabrication of a custom-made device for cleaning dome-shaped overdenture abutments.

CASE PRESENTATION

The abutment teeth are covered by the denture hence the buffering capacity of saliva is decreased, subsequently caries incidence increases. Caries are the most prevalent reason for retreatment of overdenture abutment. When a tooth is prepared as an overdenture abutment, the deeper, more porous dentin is exposed to the oral environment. The prepared occlusal dentin surfaces are more susceptible to demineralisation compared with exposed cementum root surfaces.^{5 6} When abutment tooth surfaces are left bare recurrent caries are easily detected.⁷ Bare tooth surface will show gradual attrition because of minor denture base movement. Hence, these abutment tooth surfaces should be covered by cast copings. The oral hygiene practices

adopted by the patient are important for long-term success of the overdenture as well as maintenance of periodontal health of the abutment.

Hence, there is need for a custom-made cleaning device for maintenance of periodontal health of overdenture abutments to increase their longevity.

TREATMENT

Kid's soft bristle toothbrush and a non-webbed prophylaxis cup is selected for fabrication of cleaning device for overdenture abutments. First trim the head of the toothbrush to reduce its size. Then cut the shaft of the prophylaxis cup so that only 4 mm of the shaft remains.

Then with the help of a straight fissure bur drill a hole on the backside of the toothbrush head. The diameter of the hole should be slightly larger than the diameter of the shaft of the prophylaxis cup. Attach the rubber cup to the drilled hole in the toothbrush with an autopolymerising resin. After conventional finishing and polishing of the resin the device is ready for use (figure 1).

OUTCOME AND FOLLOW-UP

The patient was instructed to use the device twice a day along with a fluoride-containing dentifrice. The

Figure 1 Cleaning device after attachment of prophylaxis cup to the brush.

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Figure 2 Photograph of overdenture abutment and cleaning technique.

bristles are used for part of the abutment that was above the gingival level and the prophylaxis cup was used in circular motion to clean the gingival sulcus effectively (figure 2). After regular use of this device periodontal health status of the overdenture abutments patients improved markedly. The patient was followed up for a period of 6 months and the gingival index which was used as a method for assessing severity and quantity of gingival inflammation was used to assess improvement in gingival health.⁸⁻⁹ The gingival score index which was initially 2.1 (severe gingival inflammation) reduced to 0.4 (mild gingival inflammation)

DISCUSSION

Patients respond favourably to overdentures as it prevents atrophy both in the maxilla and the mandible as a result of tooth loss.¹⁻¹⁰⁻¹¹ Apart from preventing bone resorption, overdenture abutments maintain sensory feedback and improve load transmission of the prosthesis.¹²⁻¹³ The oral hygiene practices adopted by the patient are important for long-term success of the overdenture as well as maintenance of periodontal health of the abutment.¹⁴⁻¹⁵

The manual toothbrush is most commonly used for the removal of plaque and cleaning the natural dentition. As an alternative to the toothbrush for prophylaxis of interdental regions there are triangular toothpicks, woodsticks, interdental brushes and dental floss. These alternatives were commonly recommended in addition to toothbrushes to focus on cleaning

between the teeth.¹⁶ However, none of these devices effectively clean the overdenture abutments.

Hence, this custom-made cleaning device for maintenance of periodontal health of overdenture abutments was invented to increase the longevity of abutments. Furthermore, the cleaning device was both cost-effective and less time consuming as the materials required for fabrication are easily available to the dentist.

Learning points

- ▶ This device increases the longevity of overdenture abutments by improving the periodontal health of the overdenture abutments.
- ▶ The bristles are used for part of the abutment that is above the gingival level and the prophylaxis cup is used in circular motion to clean the gingival sulcus effectively.
- ▶ The device was given and patients were kept on 1-year follow-up and subsequently it was found that caries incidence was less in the patients.
- ▶ The appliance was simple and cost-effective in fabrication.

Competing interests None.

Patient consent Obtained.

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