CASE REPORT

Implant rehabilitation in bruxism patient

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SUMMARY

A white female patient presented to the university clinic to obtain implant retained prostheses. She had an edentulous maxillary jaw and presented three teeth with poor prognosis (33, 34 and 43). The alveolar bone and the surrounding tissues were healthy. The patient did not report any relevant medical history contraindicating routine dental treatment or implant surgery, but self-reported a dental history of asymptomatic nocturnal bruxism. The treatment plan was set and two Branemark protocols supported by six implants in each arch were installed after a 6-month healing period. A soft occlusal splint was made due to the patient's history of bruxism, and the lack of its use by the patient resulted in an acrylic fracture. The prosthesis was repaired and the importance of using the occlusal splint was restated. In the 4-year follow-up no fractures were reported.

BACKGROUND

Bruxism is described as a diurnal or nocturnal parafunctional activity that includes clenching, locking and grinding of teeth, which can lead to an overload in the facial muscles and articular disorders.^{1 2} Such overload may lead to implant failure due to complications such as marginal bone loss, screw or ceramic fracture, loss of retention and lack of osseointegration.³⁻⁶

Most authors agree that ideal prosthetic rehabilitation should provide a single-point contact close to the centre of the implant in order to evenly distribute the occlusal load. The use of larger, longer and wider implants, a proper prosthesis design, cusps with mild slopes, smaller cantilevered spaces or minimisation of lateral occlusal contacts and the installation of an occlusal splint are some of the procedures that could help lower occlusal overload.⁷⁻¹¹

An occlusal splint is usually used to prevent dental wear caused by bruxism and is the most common method used to attenuate its harmful symptoms, such as craniofacial pain and muscle activity.¹²

There have been few studies related to implant installation in bruxism patients and no standard treatment plan established to improve the outcome. This case demonstrates the use of an occlusal splint⁵ to successfully distribute the occlusal forces and protect the implants and prosthesis from failure due to overload.

CASE PRESENTATION

The case reported was developed in a prostheses clinic of the Dentistry College of Araçatuba—UNESP. The patient had an edentulous maxillary jaw and presented three remaining teeth with a poor prognosis (33, 34 and 43) due to accentuated

Figure 1 Initial intraoral condition.

bone loss and occlusal wear off, indicating their extraction (figure 1). The alveolar bone and the surrounding tissues presented healthy aspects (figure 2).

The patient wore a complete denture in the maxilla and a removable partial prosthesis in the opposing arch. The lack of stability and retention made the patient come to the dental clinic requesting implant-supported prostheses. After a detailed anamnesis, no physical or systemic disorder was found contraindicating the implant placement surgery, but the patient reported a dental history of asymptomatic nocturnal bruxism.

The clinical procedure began with duplication of the maxillary prosthesis to make a surgical template to guide the implant placement. The surgical plan was based on this template and the panoramic radiograph. A mandibular impression was made to obtain a provisional complete denture.

Six dental implants (S.I.N., São Paulo, Brazil) of the same height and diameter (external hexagon 11.5×4 mm) were installed in each arch by an immediate postextraction technique. Two weeks after the implant placement the sutures were removed. In the same session the prostheses were relined with a soft relining material (COE-SOFT, GC America Inc, Illinois, USA), which was replaced every 20 days to protect the implant site.

After a 6-month healing period the osseointegration was confirmed through a new panoramic radiograph. The implant site was then reopened for placement of healing abutments. As soon as the adjacent mucosa was remodelled the preparation of the definitive prosthesis began.

The first impression was performed with a C-Silicone (Zetaplus, Zhermack SpA, Italy) to make an individualised open tray and to assess the need of abutments. Then the definitive implant level impression was made by the use of a transfer with polyether impression material (Impregum, 3M ESPE, Minnesota, USA) to obtain the definitive

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Figure 2 Initial panoramic radiograph.

casts. These casts were mounted in a semiadjustable articulator (Bio Art, São Paulo, Brazil) so the adequate measures of vertical dimension and central relation could be planned.

Then a complete diagnostic tooth arrangement was made on wax and function and aesthetics were assessed before the milled bars were fabricated. The setting between the milled bars and the implants was confirmed with radiographs. In a posterior session the aesthetics and function were once again verified with the milled bars in place. At this time patient consent was obtained in order to request the prosthesis finalisation.

At the installation moment the occlusal contacts were verified with dental articular paper (AccuFilm, Parkell, New York, USA). Possible compression sites in the interior surface of the prosthesis were removed with a trimming bur (Maxi-Cut, Malleifer SA, Switzerland). These adjustments were performed until complete adaptation of the patient to the new pair of prostheses. Oral hygiene instructions were given and reinforced at each visit, and the patient was scheduled to return after 6 months.

TREATMENT

Since the patient reported a self-history of bruxism, the confection of a soft stabilisation splint for nightly use was provided to prevent nocturnal teeth grinding and clenching. A new impression was made with the prostheses in position to allow the fabrication of the occlusal splint (figure 3). The patient received new oral hygiene and maintenance instructions during the occlusal splint installation and its usage importance was stated. Four months after the installation period the patient returned to the clinic with an acrylic fracture of the maxillary prosthesis (figure 4). Such a fracture possibly occurred due to an occlusal overload associated with the infrequent use of the occlusal splint.

Figure 3 Occlusal splint in position.

Figure 4 Acrylic base fracture.

The prosthesis was repaired and reinstalled and the importance of the occlusal splint use during the night was reinforced. The patient consented to continuously use the occlusal splint and no further clinical complications were reported.

OUTCOME AND FOLLOW-UP

After a 4-year follow-up no other clinical complications were observed and the patient remained satisfied with the function and aesthetics of the rehabilitation (figure 5).

DISCUSSION

Lin *et al*¹³ reported a case in which the parafunctional overload not only fractured the Branemark protocol ceramic teeth,

Learning points

- ▶ Although major teeth loss is usually rehabilitated by partial or complete conventional dentures, most patients do not have enough supporting structures to provide adequate retention and stability. For these patients implant-supported prostheses are preferable and can improve the masticatory efficiency and quality of life.
- ▶ Bruxism is a well-known risk factor for implant failure, but the increasing success rates indicate that the parafunctional habit does not contraindicate the implant installation procedure.
- ▶ The use of an occlusal splint favours the prognosis by distributing the occlusal forces and protecting the dental implants and prostheses.

Figure 5 Patient's smile after case finalisation.

but also led to the failure of the implants installed. In the cases reported by Davarpanah *et al*,¹⁴ one patient had his Branemark protocol fractured, three patients had lost at least two implants due to occlusal overload and all of them presented some prosthesis mobility 4 months after the installation period.

Competing interests None.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

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