

BACKGROUND

Night guards, used to protect teeth from wear caused by parafunctional habits such as chomping, bruxing, and grinding, may also result in unintended changes to the occlusion. The designs for night guards can be divided into those for the upper or lower dentition and those that are preformed or custom made. Full or partial coverage may be provided. Typically the design of the appliance is selected based on the clinician's preference and the patient's condition and circumstances. The serious adverse effects that can occur with over-the-counter, preformed bruxism splints include choking and changes to the soft tissues and occlusion. Because of these potential problems, patients who believe they need a night guard or splint should be seen by dental professionals. The principles of using night guards and selection criteria for patients were outlined, along with a case report and recommendations for clinical interventions related to occlusal changes caused by night guard wear.

PRINCIPLES

The principles to be remembered when night guards or splints are used are specific to the type of appliance. Guidelines have been developed for full-coverage upper arch guards, orthodontic retainers, soft night guards, and at-home bleaching trays.

Full-coverage Upper Arch Guards

Full-coverage hard acrylic guards such as the Michigan splint are permissive appliances that are intended to permit freedom of movement of the teeth against a smooth surface. The goal is to eliminate any occlusal interference. All of the lower teeth should contact the occlusal surface of the appliance in centric relation and disclusion of the posterior teeth regardless of the specific excursive movement undertaken.

These appliances provide a stable occlusal splint and can relieve symptoms of TMJ disorders, limit nocturnal bruxism, and manage uncontrolled daytime parafunctional habits. They can be worn for 24 hours, with removal simply for meal times. They are not associated with any adverse occlusal changes when properly constructed and fitted. If used for patients too young to have had their wisdom teeth erupt, patients should be evaluated regularly to monitor the progress of eruption of these teeth and plan to either extract them or create new arch guards that incorporate the wisdom teeth.

Patients may complain about the full-arch, full-coverage splints. Often they believe the splint extends back too far, but the dental professional should stress the importance of their use to the patient's occlusion, even when it's only for night-time wear. If the patient has edge-to-edge or shallow

Class I occlusal relationships, partial-coverage appliances are not appropriate.

Orthodontic Retainers

After orthodontic treatment is completed, most patients wear either a fixed or removable retainer or both to maintain the altered occlusion. All the teeth in the arch should be covered, with opposing teeth provided with even occlusal contacts as needed. These will also need to be remade if the patient has not yet had his or her wisdom teeth erupt. If they are not altered, the occlusion may be deranged by the wisdom teeth.

If full-coverage Essix-style retainers are worn in both arches, few if any occlusal problems should arise. However, when a single retainer of this type is worn, it's unlikely that all the opposing teeth will occlude evenly. As a result, this use runs the risk of intruding some teeth and having others over-erupt, especially if the patient wears the retainer 24 hours a day.

Soft Night Guards

Soft night guards should be fitted and monitored by the dental professional. Both upper and lower impressions should be obtained, along with a bite registration and facebow recording. Although this is time-consuming, costly, and not guaranteed to eliminate problems, it's essential to obtain correct occlusion. In some cases when the appliance needs a quick alteration, a hot air blower can be used to warm the posterior segments of the guard. The patient can then bite into the softened material until even contact is achieved around the entire arch. The dental professional must take care not to burn the patient or melt and deform the material. After this occlusal refinement, the occlusal surfaces should be polished.

'At-home' Bleaching Trays

Patients who are given bleaching trays for home use should be instructed not to continue wearing them after the bleaching process is completed. However, it's not unusual for patients to sleep with their bleaching tray in and then return after bleaching to request a new tray because the previous one has been worn through. Bleaching trays often extend just to the first molars, so unwanted tooth movement can occur when they are worn beyond their recommended time of use.

CASE REPORT

Woman (JW), 53, was referred for extraction of the upper left first permanent molar to address its vertical fracture. It was to be replaced with an implant-retained crown, but her examination revealed deranged occlusion supported solely by the last standing molars (Figure 18). Her history included muscle tension for at least the previous 5 years, no recent orthodontic treatment, and teeth clenching at night. She was aware of her problematic



Figure 18. A, B, and C, Front and lateral views of JW's occlusion on presentation. (Courtesy of Bereznicki T, Barry E, Wilson NHF: Unintended changes to the occlusion following the provision of night guards. *Br Dent J* 225:715-722, 2018.)

occlusion but could not remember when it became apparent to her. She was confident that she used to be able to incise with her front teeth but was unable to do so now. She also recalled gnashing her teeth during the day and had worn a soft night guard many years previously. She recently discontinued its use because she felt it was making matters worse. She couldn't recall what area of coverage it had provided. She believed that about 8 years ago a "gap" had developed between her upper left central and lateral incisors, but it was closed with composite bonding. However, it recently began to reappear. The patient was unable to find any mandibular position that allowed her front teeth to touch. Overall, she felt her occlusion had gradually changed over a period of many years.

It is likely that this patient had received a soft night guard that did not extend beyond her upper first molars, wore the guard unsupervised, and slowly had her occlusion shift. As the degree of derangement increased, her extremely heavy protrusive interference led to the vertical fracture of the upper first molar.

RECOMMENDATIONS

All patients who are given an appliance, whether full- or partial-coverage, should receive both written instructions on the use of the appliance and an outline of the goals for treatment. In addition, patients should be given warnings about the possible risk of unwanted side effects that can be difficult or impossible to reverse. The dental professional should ensure that the patient is aware that regular visits to monitor the patient's condition will be needed. For these, the patient will need to bring in the appliance for assessment. The patient should only wear the appliance 24 hours a day if clearly instructed to do so. Appliances should never be modified in any way by the patient.

Several situations dictate that the patient contact the dentist immediately. These include the following:

- When their front teeth no longer touch, which can keep them from biting through things.

- If the appliance is lost. A replacement appliance should not be based on 'old' models but on new ones that reflect the patient's current occlusion.
- If 'new' teeth erupt. The dentist will need to monitor the eruption and provide a new appliance if indicated.
- If any teeth covered by an appliance become sensitive. The dentist will evaluate the presence of erosive wear that may have been exacerbated by the appliance or other influences, such as regurgitated stomach acid being retained between the appliance and the teeth.

In addition to these considerations, it's important that the study casts and photographs be carefully obtained and stored. These provide invaluable sources for comparison when monitoring a patient and the treatment provided and can facilitate discussions with patients. Should any medicolegal issues arise, they also provide objective evidence of the events in a case.

Clinical Significance

No matter what type of night guard is selected for a patient, the dental professional should respect the patient's existing occlusal scheme. If this is not done, inadvertent changes to that scheme will develop after the night guard appliance has been worn for some period. Correctly designing and fitting full-coverage appliances for patients constitute the preferred course of treatment.

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