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Aftercare of the Complete Denture Patient

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Abstract

Complete denture treatment does not end with the insertion of the finished prosthesis. Regular denture maintenance by the patient and periodic consultation with the prosthodontist are essential for the long-term success of treatment. This article attempts to focus on the points to be considered in the aftercare of the complete denture patient.

Continued success of complete denture service depends on regular denture maintenance by the patient, combined with periodic consultation with the prosthodontist. Only by ensuring the maintenance of the ever-changing remaining oral structures can the patient's long-term prosthetic demands be met.[1] This article attempts to highlight the points to consider in the aftercare of the complete denture patient.

Rationale for long-term aftercare for the complete denture patient

Lack of aftercare for complete denture patients can result in damage to support tissue mucoperiosteum, and underlying bone. This may be localized or generalized, with or without pain,[2] and will predispose the patient to increased ridge resorption.[3] Damage to the facial musculature and temporomandibular joints may also occur. This may manifest as peculiar posturing or lead to long-term wear of dentures that have outlived their useful life.[2]

Since dentures are often provided for the more elderly section of the population, it would seem logical to review the oral tissues of such patients on a regular basis. In this way, not only can the dentures be properly maintained, but the oral tissues can be examined for early signs of loss of tissue health, which may or may not be associated with the wearing of dentures. Lesions, as denture stomatitis, or, rarely, neoplasms can thus be diagnosed and treated early.[2] Patients should be informed that new dentures require a period of adjustment (the length of the adjustment period is highly variable and depends on the patient).[4]

Education of the denture patient at the placement appointment

Individuality of the patient

Patients must be reminded that their anatomic, psychological, tissue tolerance and oral conditions, are individual in nature. Thus, they cannot compare their progress with new dentures to other persons' experiences.[5]

Appearance with new dentures

Patients must understand that their appearance with new dentures will become more natural with time. A repositioning of the oral and facial muscles and a restoration of the former facial dimension and contour by the new dentures may seem like too great a change in the patient's appearance. This can be overcome only with the passage of time, and patients are advised

to persevere during the period. Patients can be advised that a change in hairstyle or glasses along with their new dentures will allow others to notice the overall change in the face.[5]

Mastication with new dentures

Learning to chew satisfactorily with new dentures usually requires at least 6 to 8 weeks. Patients will become discouraged unless they are aware that this learning period is to be expected. New memory patterns must be established often for both the facial muscles and the muscles of mastication. The muscles of the tongue, cheeks, and lips must be trained to maintain the dentures in position on the residual ridges during mastication. Patients can be told that "these muscles must learn what they should and should not do."[4]

Occasionally, edentulous patients have gone without dentures for long periods and have learned to crush food between the residual ridges or perhaps between the tongue and the hard palate. These persons usually experience increased difficulty in learning to masticate with new dentures, and the time for adjustment will likely be extended.[5]

Patient comfort and mastication may be impaired because of the elicited excess flow of saliva for the first few days after placement of new dentures; however, in a relatively short time the salivary glands accommodate to the presence of the dentures, and normal production of saliva returns.[5] Deglutition will be necessary to eliminate the excess saliva, and patients should be advised that compulsive rinsing or spitting should be avoided, as it is unsettling to the denture bases.[6]

Eating with ease and efficiency requires time, patience, and training. The most efficient artificial teeth are only about one third as efficient as natural teeth. Eating habits must be changed to compensate for this difference. Sticky foods or hard foods that require considerable force to masticate should be avoided. (Most breads become glutinous when chewed).[7]

First-time denture wearers may be advised to eat foods that require little mastication, such as well-cooked cereals, boiled eggs, and very tender or ground meats, and those that are ready for swallowing with a simple push of the tongue against the palate. This will give patients confidence in stabilizing the dentures.[4] New denture wearers will need to chew longer, eat more slowly, and cut fibrous foods such as apples and carrots into bite-sized pieces.[8]

There are other instructions that the patients should be given regarding mastication with dentures.

(1) Patients should begin chewing relatively soft food that has been cut into small pieces. If the chewing can be done on both sides of the mouth at the same time, the tendency of the dentures to tip will be reduced.[5]
(2) When biting with dentures, patients should be instructed to place the food between their teeth toward the corners of the mouth, rather than between the anterior teeth.
(3) Patients should be instructed to divide the normal forkful of food in half and place each half posteriorly and bilaterally. Placing the food posteriorly, in the area of the first molar, increases the power of the masticatory stroke and places the occlusal load over the primary bearing area (i.e. the maxillary tuberosities and mandibular buccal shelf).[6]
(4) Biting with the front teeth, even if possible, should be avoided. If this practice is continued, the support will be lost, and the dentures will become loose.[7] Biting on the front teeth is comparable to a class I lever, like taking a seat on one end of a seesaw with no one on the other end.[7] The anterior part of the maxilla is the weakest part of the upper arch to resist stress, and when the lower anterior teeth occlude anterior to the basal support, trauma is inevitable.[9]

Coughing and sneezing often dislodge the dentures and result in an embarrassing situation. Embarrassment can be avoided by covering the mouth with a handkerchief.[7] Many dentures are lost during nausea accompanying seasickness, car sickness, or air sickness. When vomiting seems imminent, the dentures should be removed and kept in water until the patient recovers.[7]

Tasting and swallowing

A full upper denture can have an impact on taste and swallowing ability.[8] Taste sensitivity may be reduced when an upper denture covers the hard palate due to the fact that a smooth acrylic denture surface may modify the sense of touch within the oral cavity, and "protect" the mucosa from the sensation of hot or cold foods. A reduced salivary flow rate also may have a negative effect on taste perception, because the flavoring agents in food are less likely to be dissolved.[10]

It also becomes difficult to determine the location of food in the mouth when the palate is covered. As a result, swallowing can be poorly coordinated, and dentures can become a major contributing factor to deaths from choking.[8]

Nutritional support

Nutritional support will improve the tolerance of the oral mucosa to new dentures and prevent rejection of dentures. Nutrition goals for the denture-wearing patient are to eat a variety of foods, including protein sources, dairy, fruits, vegetables, grains, and cereals, and to limit salt, fat, and sugar intake. Adding one glass of milk or orange juice will make a significant contribution to nutrient intake.[11] A prosthodontist should discuss the five essential principles of nutrition education with patients at the time of denture placement and in follow-up appointments to build success and satisfaction.

Principle 1. Food choices are affected by both the ability to chew and the perceptions of hard-to-chew foods

Associations between dentures and increased consumption of more refined carbohydrates and sucrose are thought to be the result of impaired chewing and avoidance of difficult-to-chew foods. Denture patients should be made aware of the difficulties that these foods may present. The prosthodontist should also stress that some foods that cause chronic pain or discomfort should be eliminated from the diet and replaced with foods that can provide equal and adequate nutrition (e.g. replace raw crunchy vegetables in salad with steamed vegetables).[12]

Principle 2. Essential fruit, vegetable, and dietary fiber intakes are enhanced with attention to food selection and preparation issues

In general, denture wearers have lower intakes of vegetables, fruits, and whole grains. Even when they perceive that their dentures are functional, reported dietary intakes of vitamins C and E, beta carotene, folate, lutein, and lycopene/zeaxanthin are lower than in those who do not wear dentures. Citrus fruits, nuts, carrots, whole grain breads and cereals, and other colorful fruits and vegetables are dietary sources of these nutrients that may be avoided by those who perceive that these are difficult to bite or chew. Such patients may choose cooked cereals and grains.[12]

Principle 3. Dietary supplementation may play a limited role in maintaining nutritional status

Edentulous patients aged 65 years and older had a significantly lower intake of calcium, iron, niacin, and vitamin C than their dentate counterparts. This was also associated with low plasma levels of both ascorbate (vitamin C) and retinol (vitamin A).[13] A simple multivitamin supplement can be suggested in situations where there is an absence of essential foods or diminished dietary intake of important food groups like fruits, vegetables, and grains.[12]

Principle 4. Positive aging is associated with an increased need for high-quality protein

It has been estimated that the edentulous are at an increased risk of malnutrition. Hence, they should endeavor to consume a diverse, adequate, and healthy diet with emphasis on high-quality proteins (dairy foods, fish, meat, chicken, eggs).[12]

Principle 5. Adequate hydration may improve masticatory skills

Decreased thirst perception, medication, cognitive changes, limited mobility, and increased use of diuretics and laxatives can increase risk of dehydration in elderly individuals. Decline in kidney function and hormonal changes associated with aging are also important considerations in this population. Denture wearers need to maintain a moist oral environment to assure denture placement and augment mastication through at least eight, 8-oz glasses of water daily.[12]

Tongue position

The most common complaint of complete denture patients concerns the "loose" mandibular denture. Patients should be educated to the three basic handicaps associated with all mandibular dentures. First, although the area of the mandibular denture basal seat is approximately one-third the area of the maxillary denture, both are subjected to the same occlusal loads and thrusts. Second, the mandibular denture is surrounded buccally as well as lingually by muscles, all of which have a potential for denture base disruption.

Last and most important, the mandibular denture depends on proper tongue position to maintain adequate peripheral seal and stability.[5] Patients whose tongue normally rests in a retracted position relative to the lower anterior teeth, should attempt to position the tongue farther forward so it rests on the lingual surfaces of the lower anterior teeth. This will help develop stability for the lower denture.

Speaking with new dentures

Speaking normally with dentures requires practice. Patients should be advised to read aloud and repeat words or phrases that are difficult to pronounce. The adaptability of the tongue to compensate for changes is so great that most patients master speech with new dentures within a few weeks.[5] It should be noted that elderly patients with dentures often have hearing impairments and will have a greater difficulty in changing speech patterns without auditory feedback.[5]

Maintaining tissue health

There are three factors involved in the maintenance of healthy edentulous oral tissue: importance of tissue rest, complete denture hygiene, and cleansing of oral tissues.

Tissue rest

Removing the maxillary and mandibular dentures before sleeping serves two purposes: it provides a convenient time for soaking the dentures in a cleaning solution and it allows the oral tissues to rest. Adequate rest allows the oral tissues to offset the daily stress placed upon them by denture wearing.[5] The dentures should be removed for at least 8 of each 24 hours to allow the tissues to rest. Patients should be advised that the oral tissues were never intended to be covered or to support a hard denture base. All occlusal forces are compressive to the soft tissues and squeeze the tissue between denture and bone. Failure to allow the tissues to recover from these forces may result in increased soreness and irritation. Additionally, many patients clench and brux during sleep. These can be powerful movements that can severely damage the underlying foundation. Removal of dentures will eliminate this potential hazard.[6] Immediately after processing, a denture produced in a mold with tinfoil substitutes contains some water. In service, further water absorption can occur up to an equilibrium value of about 2%. It has been claimed that each 1% increase in weight of the resin due to water absorption causes a linear expansion of 0.23%. Similarly, drying out of the material is associated with shrinkage. For this reason, dentures should be kept wet at all times when not in service (Fig 1).[14]

Complete denture hygiene

Denture cleanliness is essential to prevent malodor, poor esthetics, and the accumulation of plaque/calculus and biofilm.[14]Abelson[15] pointed out that the plaque on the tissue surface side of the denture is unquestionably a major etiologic factor in the pathogenesis of denture stomatitis, inflammatory papillary hyperplasia, and chronic candidiasis. A survey by Jagger and Harrison[16] found that a large number of people did not know how to clean their dentures satisfactorily, either as a result of never having been given advice or not following that advice. de Castelluci Barbosa et al[17] showed that 78% of subjects used the same complete denture for over 5 years, 64% slept with

Figure 1 Soaking maxillary and mandibular dentures.

their prostheses, and none of the patients interviewed knew anything about brushes designed specifically for complete dentures. Therefore, it is crucial for dental practitioners to inform their patients about denture cleanliness for the prevention of such adverse effects (Fig 2). Patients should be instructed to rinse their dentures and their mouths after meals. Once a day, it is essential that the dentures be removed and placed in a soaking type of cleanser for a minimum of 30 minutes for effective killing of microorganisms on the dentures, as well as removal of all stains. Before the dentures are placed in the cleanser, they should be brushed gently with a soft brush (Fig 3). Patients need to be instructed that brushing is required to remove plaque, because soaking alone will not do so. The dentures should be brushed over a basin partially filled with water or covered with a wet washcloth to prevent breakage, in case they slip from the hand.[5] When the lower denture is cleaned, it should not be held in the palm of the hand. If the denture slips, it may snap into two pieces when it is clutched. The patient should be instructed

Figure 2 Mandibular denture with wear of acrylic teeth and stains.

Figure 3 Denture brush.

to grasp the denture between the thumb and the forefinger. Patients should be discouraged from using toothpastes, because most of them contain an abrasive material that will wear away the surface of acrylic resin.[5] For acrylic resin dentures, it is recommended that the dentures be rinsed after every meal, and any debris be removed by brushing with a soft brush, soap, and cold water.[16]

Tissue hygiene and massage

An often neglected facet of complete denture care is tissue cleansing and massage. The best regimen should include denture brushing and tissue cleansing.[6] The mucosal surfaces

Figure 4 Denture cleaning tablets and powder.

of the residual ridges and the dorsal surface of the tongue also should be brushed daily with a soft brush. This will increase the circulation and remove plaque and debris that can cause irritation of the soft tissue or offensive odors.[5]

Denture adhesives

Residual ridges can be damaged by the use of denture adhesives to compensate for ill-fitting dentures. Adhesives, especially home reliners, can modify the position of the denture on the residual ridge, resulting in a change of occlusal vertical dimension or a change in the tooth contact in the centric relation position, which may cause irreparable damage to the residual ridges in a short time.

The use of a denture adhesive is not a treatment modality, per se, but rather an adjunct to denture treatment. Advice to the patient regarding the use of denture adhesives should include

(1) Use the minimum amount necessary to achieve the desired result.
(2) Distribute the adhesive evenly over the tissue-bearing surfaces.
(3) Apply or reapply when necessary.
(4) Always apply denture adhesive to a clean tissue-bearing surface.
(5) Schedule periodic professional oral evaluations.[18]

The patient should be shown the proper use of denture adhesives. Pastes and powders work equally well, and the decision should be based on patient preference. Adhesive pads must be avoided, because they can drastically alter the fit of the patient's dentures. Regardless of the adhesive used, patients should keep both the denture and soft tissues clean. Adhesives can be very tenacious, and if they are not completely removed from the denture and the mouth, they can harbor organisms harmful to the patient's oral health.[19]

Educational material for patients

People remember less of what they hear than of what they see. For this reason, it is wise to provide denture-wearing patients with printed information about their new teeth, about the care and cleaning of the teeth, about their use (Fig 4), and most important, about the necessary periodic inspections. In studying the material, patients become aware that dentures are not permanent, that the mouth changes, and most importantly, that the care they provide themselves may be a deciding factor in the success they experience with dentures.[5] Availability of the printed information in languages other than English is important for those patients for whom English is a second language.

Periodic recall for oral examination

The patient should be seen 24 hours after placement of the dentures to address any difficulties or to answer any questions the patient may have. Periodic recall appointments should also be scheduled 1 week and 1 month after placement for the same purpose. If the patient requires, additional adjustment visits may be needed.[18]

Every denture-wearing patient should be in a periodic recall program, just as any other dental patient is.[4] This includes using the ultrasonic cleaner to rigorously cleanse the denture with a stronger denture cleansing solution and rigorous rinsing afterward.

Jainkittivong et al[20] found that denture wearers exhibited a significantly higher prevalence of oral mucosal conditions (62.7%) than subjects with no dentures, in a sample of 500 Thai patients aged 60 years and older. The incidence of denture-related conditions among complete denture wearers was higher (46.3%) than in those wearing partial dentures (40.8%).With regard to denture-related conditions, traumatic ulcers and denture stomatitis were the two most commonly associated problems associated with ill-fitting dentures and poor denture hygiene.

Of particular relevance in the elderly patient with complete dentures is the presence of oral malignancy. It has been reported that the oral cavity and pharynx combined constitute

the sixth most common site for cancer, and that oral cancer is increasing in a number of countries in both the developed and developing world.[21] Guggenheimer and Hoffman[22] found that in a study of almost 1000 patients with oral cancer, 59% were totally edentulous. The high rate of edentulism among patients in whom oral cancer develops stresses the need for screening by prosthodontists. The opinion is still valid that if a sore spot does not heal after correction of the denture, malignancy should be suspected.[3] Therefore, a 6- to 12-month interval is the suggested time between periodic recall appointments for most patients with complete dentures.[22]

Complete denture service cannot be adequate unless the patients are cared for after dentures are placed. Prosthodontists should accept responsibility for providing adequate instructions in aftercare of dentures as an essential part of patient preparation to receive a denture. Periodic recall appointments can be used to assess compliance and the need for reinforcement.[23]

Conclusion

Caring for the complete denture and the oral tissues needs special attention, and patients need to be educated regarding this fact.

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