



Oral Health Care Services *for Older Adults:* A LOOMING CRISIS

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TWO IMPORTANT ORAL HEALTH POLICY CONCERNS in the United States are disparities in the oral disease burden, and the inability of certain segments of the population to access care.¹ Both of these challenges are largely due to socioeconomic stratification in U.S. society. Nevertheless, as a consequence of the release of the Surgeon General's report on oral health,¹ there has been a call to action to improve the oral health of underprivileged groups who have difficulty accessing dental services. In particular, an emphasis was placed on children, and, specifically, the oral health of economically disadvantaged children.

Growing and Diverse Older Population

In contrast to the extensive national attention focused on children's oral health in recent years, America's growing elderly population has received relatively little attention, and almost no public health or public policy interventions. The population projections for the United States indicate that the elderly will comprise an increasing

percentage of the population as we proceed into the 21st century.² In 2001, the population of the United States was almost 278 million, and 12.6% of the population was 65 years of age or older. By 2015, the population is expected to increase to 312 million, and 14.7% of the population will be 65 years or older. In 2030, which is within the practice lives of students currently enrolled in dental schools, the population will increase to more than 350 million, and 20% of the population—one out of every five members of U.S. society—will be 65 years of age or older. Further, the elderly population will become increasingly diverse in terms of race/ethnicity, financial resources and living conditions.

A substantial number of older adults will be able to function quite independently in their communities. The majority of their working lives will have been spent during periods of relative economic prosperity. With attention to oral health earlier in their lives, these seniors will have complete or near-complete dentitions, and sufficient resources to afford some out-of-pocket expenses for dental services. In contrast to these community-dwelling elders, others will be homebound or have limited access outside of their homes, while still others will live in long-term care (LTC) facilities. Access to dentists is just one of the complicated and varied difficulties that will be encountered in attempting to provide health care to this group of seniors.

For the vast majority of seniors in LTC facilities, financing of oral health care services will be a formidable challenge. Medicare does not provide coverage for routine dental services; and in the absence of private insurance or personal resources, a large portion of this group will not be able to afford the most appropriate treatments, or any dental services whatsoever. Clearly, there must be a response to the increasing oral health concerns of the elderly who present with special needs, especially those who are homebound, living in LTC facilities and burdened with other chronic disorders.

Disproportionate Impact of Oral Diseases on Seniors

For obvious and less obvious reasons, oral and dental diseases have a disproportionate effect on the elderly. In addition to years of exposure of their teeth and related structures to microbial assault, their oral cavities will show evidence of wear and tear as a result of normal use (chewing and talking), and destructive oral habits such as bruxism (habitual grinding of the teeth). The elderly also suffer from chronic disorders that can directly or indirectly affect oral health, including autoimmune disorders such as pemphigus and pemphigoid.³ The elderly often require multiple medications; and a common side effect of more than 500 medications is reduced salivary flow.⁴ A reduction in saliva can adversely affect the quality of life, reduce the efficiency of chewing, and lead to significant prob-

lems of the teeth and their supporting structures.

The elderly may also experience difficulty performing routine oral hygiene procedures because of physical limitations. In addition, oral infection is now recognized as a risk factor for a number of systemic diseases, including cardiovascular and cerebrovascular diseases, diabetes mellitus and respiratory disorders. Finally, it is important to emphasize that once people become edentulous and are using complete dentures, their oral health needs do not cease. Jaws are not static, and may continue to resorb over time. Ill-fitting prostheses can adversely affect chewing and lead to poor nutrition. People without teeth remain susceptible to oral cancer, mucosal diseases and alterations in salivary gland function.

Sentinel Measures of Oral Health

Tooth loss is one general measure of the oral health status of a population. Furthermore, while there are many diseases that affect the oral cavity, caries, periodontal disease, oral and pharyngeal cancer are other sentinel measures used to track oral health at the population level. These are discussed below.

Tooth Loss: The percent of individuals who are totally edentulous has decreased from 1971-1974 (*NHANES I*) to 1988-1994 (*NHANES II*).¹ This was found across all age groups, including those aged 18 to 34 (from 2.0% to 0.44%), 35 to 54 (from 33.3% to 20.1%) and 65 to 74 (from 45.6% to 28.6%). This encouraging trend, however, will be accompanied by other challenges. As the aging population retains more teeth, these seniors will be at increased risk for caries and periodontal diseases.

Furthermore, there are distinct regional and state differences in tooth loss experienced by older (> 65 years) Americans.⁵ Using data from the Behavioral Risk Factor Surveillance System (BRFSS), the highest percentage of edentulous individuals was seen in Kentucky (42.3%) and West Virginia (41.9%), while the lowest percentage was observed in Hawaii (13.1%) and California (13.3%). Determinants of the loss of six or more teeth include lack of a high school diploma, a household income of less than \$15,000, self-identifying as non-Hispanic black, current smoking and being in poor-to-fair health status (including having diabetes).

Dental Caries: Dental caries is the most common disease of childhood. Nevertheless, as adults retain all or more of their teeth into their later years, the number of teeth at risk for root caries, as opposed to the coronal caries commonly observed in children, will increase. In fact, in the most recent national survey (*NHANES III*), nearly half of all individuals 75 years and older had root caries on one or more teeth. A comparison of *NHANES I* and *NHANES III*, where data were collected in 1971-1974 and 1988-1994, respectively, reveals that the percent of teeth with caries (treated or

For obvious and less obvious reasons, oral and dental diseases have a disproportionate effect on the elderly.

untreated) decreased for individuals between ages 18 and 54, but increased for those between ages 55 and 74.¹ Further, the progression of root caries in an individual with little or no saliva can be quite rapid; and the restoration of these lesions is often technically challenging.

Periodontal Diseases: Periodontal diseases comprise the second common group of oral disorders. These are inflammatory disorders affecting the supporting structures of the teeth, and manifest as tissue inflammation and loss of alveolar bone supporting the teeth. NHANES III clearly demonstrated that the proportion of adults with loss of attachment along the root surface (a measure of periodontitis) increased with increasing age. For example, the percent of individuals that displayed at least one tooth with at least 4 mm of loss of attachment increased from 3% for those ages 18 to 24, to 12% for those ages 25 to 34, up to 22% for those ages 35 to 44, increasing to 55% for ages 65 to 74, and finally 65% for individuals 75 and older.¹

As noted previously, the concern for increased prevalence of periodontitis in older individuals must be considered in light of the risk posed by periodontitis for certain systemic disorders, including cardiovascular and cerebrovascular diseases, diabetes mellitus and respiratory disorders. Periodontal infections are chronic, and the Gram-negative bacteria that characterize advanced forms of periodontitis can be an important source of endotoxin. These organisms, and endotoxin, gain access to the systemic circulation, with resultant activation of the inflammatory response.

Patients with periodontitis have been shown to be at increased risk for myocardial infarction, fatal myocardial infarction and stroke.^{6,7} Anti-infective treatment of periodontitis has been shown to improve the metabolic management of patients with poorly controlled diabetes mellitus;⁸ and a professionally administered oral hygiene program provided to LTC patients has been shown to reduce the occurrence of fever and death due to pneumonia.⁹

Oral and Pharyngeal Cancer: Each year, approximately 30,000 individuals in the United States develop oral cancer. Oral and pharyngeal cancers are predominantly disorders of the elderly, as the median age at diagnosis is 64 years. Epidemiologic surveys reveal that the incidence of these disorders has decreased approximately 0.5% per year over the period from 1973 to 1996. One disturbing statistic, however, is that the survival rate for these cancers has not improved in 25 years.¹ The etiology of oral and pharyngeal cancers has been intensely studied, and the use of cigarettes and alcohol are the primary determinants. Hence, smoking cessation activities are increasingly recognized as vital to dental practice.

Addressing the Oral Health Care Needs of the Elderly

The need for a coordinated effort to address the oral health care needs of the elderly is suggested by demographic trends and epidemiologic data. This plan must consider contributions from the dental profession, possibly, through the efforts of the American

Dental Association and its state and local associations; the dental schools, with involvement of the American Dental Education Association; federal, state and local health authorities; as well as assistance from national organizations and foundations that focus on health care. With adequate attention and focus, a variety of national initiatives with implementation on the state and local levels will serve to improve access to oral care for older Americans who are currently most in need, including the poor and disabled.

While effective preventive measures exist for younger populations (water fluoridation, dental sealants), no preventive measures are yet available to thwart the expected increase in oral health needs of the aging population. There are, however, a number of approaches that should be considered.

Geriatric dentistry should receive increased emphasis by the nation's dental schools, and, specifically, in predoctoral dental curricula. This suggestion has been proposed in the past, but assumes new urgency now. Nevertheless, it is important to recognize that there is a need to balance the ever-increasing demands for curricular time with the requirement that dental schools graduate individuals who are capable of treating the public after only four years of education.

A national program for older Americans similar to the ADA-sponsored "Give Kids a Smile" should be launched. In addition, a campaign comparable to the ADA-supported initiative to increase awareness about oral cancer may prove effective. Mandatory continuing education in geriatric dentistry is another approach to inform the practice community about the oral health care needs of the elderly. According to the ADA, at least 45 states and the District of Columbia and Puerto Rico require continuing education for relicensure of dentists.¹⁰ Data from recent BRFSS surveillance activities⁵ indicate differences in tooth loss by geographic locale, supporting the concept of regional or state strategies.

U.S. dental schools, which often focus their service programs on those who have difficulty accessing care, can focus both on-site and off-site care activities on older populations. This could be accomplished via local outreach to older, fully ambulatory seniors who could come to the school clinics for care, and by seeking collaborations with nursing homes and other LTC facilities that have been established for older adults with greater health and personal needs. Many of these facilities have on-site dental operatories, but staffing may be limited because of budget constraints.

Effective and relatively inexpensive preventive procedures and protocols can be employed for the elderly who have problems accessing care, including application of topical fluoride varnishes and anti-infective (chlorhexidine) rinses or swabs. Under certain circumstances, these services could be delivered by home health aides and staff at LTC facilities.

Collaboration with other health care providers who routinely treat the elderly should be encouraged, with a focus on increasing

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their awareness of potential oral health problems. They might be asked to discuss the need for dental care visits and proper dental care with their patients. A cursory oral examination can be conducted by other health care professionals besides dentists, and referrals made based upon findings or specific patient complaints.

The challenges faced by both the dental profession and the nation as a whole regarding provision of oral health care services to older adults has been the subject of a recent report prepared by Oral Health America titled, "A State of Decay: The Oral Health of Older Americans."¹¹ This report notes that older Americans suffer disproportionately from oral diseases, and the problem is particularly acute for individuals in LTC facilities. Further, the report surveyed all 50 states to determine the level of Medicaid coverage for dental services, and concluded that financing oral health care services for the elderly is a major challenge. Medicare does not provide any coverage for dental services, and only one of five Americans who are age 75 have any type of private dental insurance. The overall assessment for the nation, reflecting availability of dental coverage, was a grade of "D."

The ADA report on the Future of Dentistry briefly addressed the problem of financing of dental services for the elderly, especially in light of reductions in employer-sponsored coverage of dental services for retired workers.¹² While suggestions were offered (tax-deferred accounts for medical and dental services, reliance on public funding for special needs and disabled individuals), a comprehensive plan was not proposed.

Call for National Attention on Geriatric Dentistry On September 22, 2003, the Senate Special Committee on Aging held a forum, chaired by Senator John Breaux of Louisiana, on "Ageism in Health Care: Are Our Nation's Seniors Receiving Proper Oral Health Care?" Presentations by the Surgeon General and representatives of the ADA and American Dental Education Association, as well as the positions of practitioners involved in the provision of care to the aged, blind and disabled, were passionately argued.

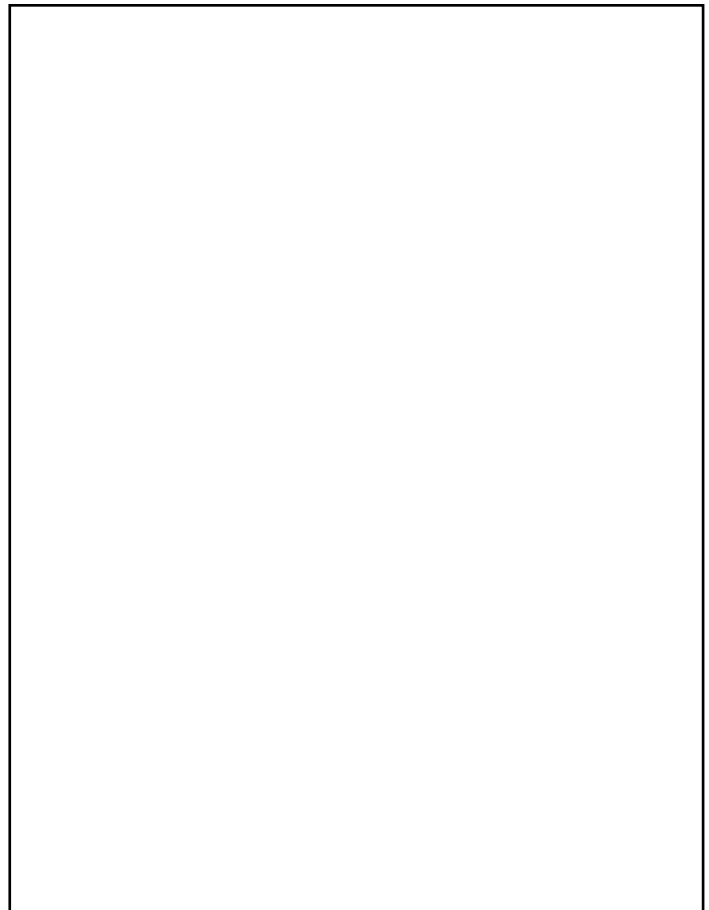
It is generally acknowledged that there is a paucity of dental practitioners who are formally trained to meet the needs of elderly patients. Geriatric dentistry is not a recognized dental specialty. There is no obvious source of support for training a new group of "gerodontologists." Since care of the elderly is not the specific purview of any dental subspecialty, professional organization- and association-based responses to the challenge of providing oral health care services to the elderly need to be developed. In this way, the dental profession has the opportunity to take a leadership role

in the delivery of health care services for our seniors, who have contributed so vitally to our society's well-being, and deserve to be treated with the best oral health care we have to offer. ■

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The Missing Link

The Endodontic/Restorative Continuum

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Abstract

The endodontic treatment and the restoration of compromised teeth have largely been viewed as two separate unrelated procedures. The research, however, suggests that the way the endodontic procedure is performed may influence the long-term prognosis for the restored pulpless tooth. Also, studies suggest that the protocol followed when restoring pulpless teeth may affect the long-term prognosis of the endodontic treatment. This article explores the synergistic relationship between these two procedures and suggests how new resin technologies might help to increase success rates of endodontically treated teeth. New methodologies for obturating roots for better seals, for placing posts to strengthen roots against fracture and to retain cores, and the need for ferrules are discussed, with a review of the evidence pertaining to these subjects.

THE RESTORATION and the endodontic treatment of compromised teeth should not be considered two separate, unrelated procedures. It is beneficial for the practitioner performing the endodontic treatment to consider the eventual restoration of that tooth, and for the restoring dentist to consider and respect the endodontic treatment.

The restoring practitioner should bear in mind that there are two primary goals to endodontic treatment:

1. The cleaning and disinfection of the canals.
2. The sealing of those canals, so as to prevent reinfection of the canals and the entombment of microorganisms left in the canals.

The endodontic practitioner should bear in mind that the concerns of the restoring dentist are:

1. Postoperative root strength and the avoidance of vertical root fracture.
2. Retention of the core of an esthetic restoration.

Numerous cross-sectional studies have shown that the success rate of endodontics is about 60%.^{1,2,3} Furthermore, studies have revealed that the quality of the coronal restoration directly affects the long-term success of the endodontic procedure.⁴ Coronal leakage provides a constant source of microorganisms and nutrients that initiate and maintain periradicular inflammation, and may well be the largest cause of failure of nonsurgical endodontic therapy.⁵ Studies testing the sealing ability of obturation materials and techniques have found that gutta-percha and conventional root canal sealers do not prevent coronal microleakage when exposed to the oral cavity.⁶

When a post is placed in the root, the procedure should be done in an aseptic environment, so as not to re-infect the canal system. Therefore, a rubber dam should be used, and the post and drills used to create the post space need to be disinfected before they are introduced into the canal. One study concluded that to prevent reinfection of the root canal system, it might be preferable to restore the tooth immediately with a prefabricated post and composite system.⁷

Post preparation, when performed subsequent to the endodontic procedure, is not only an opportunity to introduce bacteria into the root canal, but might also disturb the apical seal. This could cause apical leakage into the periradicular spaces of residual microorganisms left in the canal at the time of endodontic treatment.⁸ Posts placed at the time of the endodontic procedure, before the rubber dam is removed, afford the best situation for prevention of coronal re-infection of the canal system.

Improved Technology

Dentin bonding technology has enjoyed tremendous advancements in the past 20 years in techniques and materials. Some studies have applied these principles to the radicular dentin and have found promising results in the sealing ability of the coronal, apical and lateral portals of the root canal.^{5,9}

Many studies suggest that when principles of hydrophillic dentin bonding are applied to the root canal, it might help to prevent vertical root fracture. The cumulative loss of tooth structure from caries, trauma, and restorative and endodontic procedures leads to susceptibility to fracture.¹⁰ Endodontic access into the pulp chamber destroys the structural integrity provided by the coronal dentin of the pulpal roof, and allows greater flexing of the tooth under function.¹¹

Current obturation techniques utilize heat and pressure to help seal the canals. Excessive force has been shown to introduce microfractures into the radicular dentinal complex, which can lead to the catastrophic vertical root fracture of endodontically treated teeth.¹² A study measuring root strains associated with different obturation techniques found the Obtura generated the highest strains, and that both the Thermafil groups and the Obtura groups caused thermal expansion of the dentin by introducing thermal strain into the radicular dentin.¹³ Exacerbating the threat to the structural integrity of the root by thermal strain is the subsequent introduction of physical strain into the canal system by the use of tapered instruments to laterally or vertically compact the obturation materials.

In current obturation techniques, a weakened root is filled with heated gutta-percha, causing thermal strain and dentinal expansion. Further insult is provided by the introduction of force with tapered instruments, which may cause vertical root fracture.¹⁴

The use of hydrophillic resins to seal the canal system offers promise for the obviation of many of the shortcomings of current obturation materials and techniques. The seal produced by hydrophillic resins is accomplished in a passive manner, introducing no strains into the canal. With the smear layer removed by NaOCl and EDTA, the resin sealer is able to penetrate the dentinal tubules and lateral canals by being pulled into the canals by hydrophillic attraction of the fluids in the dentin (Figures 1,2,3). This phenomena of wet dentin bonding has been used successfully in the coronal aspect of the tooth for years, and the science has undergone significant positive evolution. This quality of resins may be used in conjunction with 2% chlorhexidine gluconate as the dentin wetting agent to take advantage of CHX's ability to prevent microbial activity in vivo with residual effects in the root canal up to 48 hours.¹⁵

The Efficacious Seal

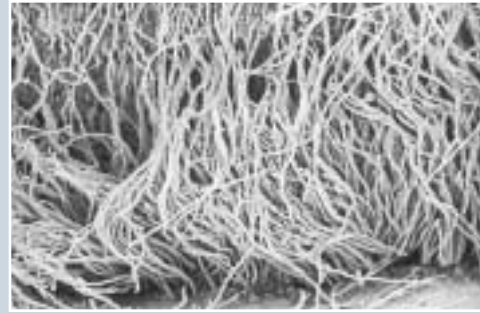
Two systems utilizing biocompatible resin as a sealer and an obturator of resin fiber, and a soft resin gutta-percha replacement have been tested at several research centers.

It was found that this passively introduced system seals the canal coronally and apically significantly better than either laterally condensed gutta-percha and AH-26 or vertically condensed heated gutta-percha and AH-26 in the continuous wave technique when challenged with bacteria in the Torbinejad model.¹⁶ Because all the materials are of similar resins, a true monoblock effect is realized

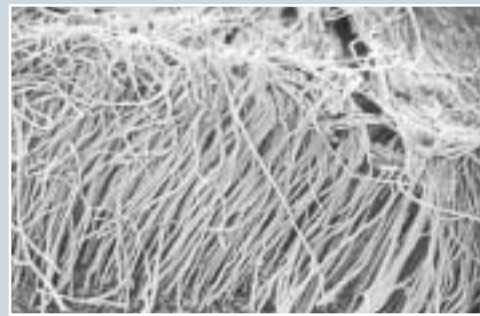


Figures 1-3: Resin tag penetration into dentin tubules.

1: Coronal segment



2: Mid-root segment



3: Apical segment

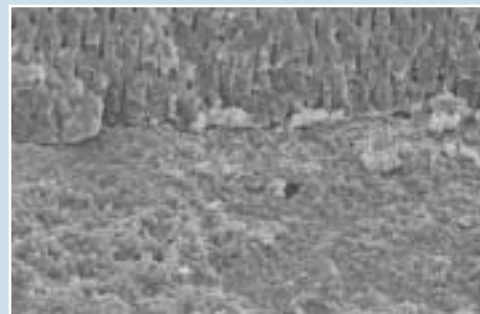


Figure 4: SEM of bonded interface between sealer and resin obturator.

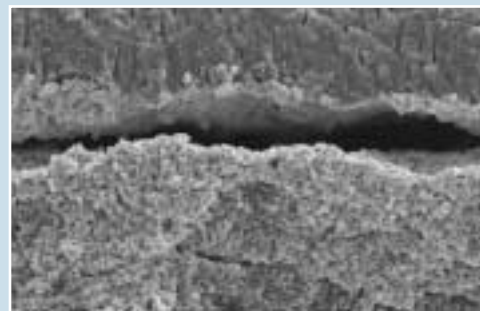


Figure 5: SEM of gap formation between AH26 and gutta-percha.

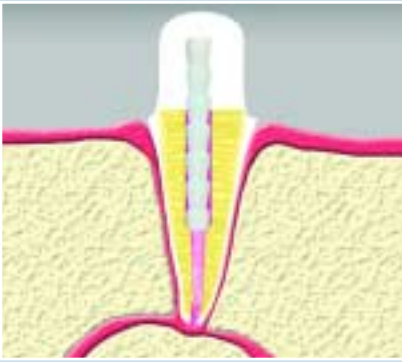


Figure 6: Graphic representation of post/obturator.



Figure 10: Graphic of NEXT reinforcing obturators in place.



Figure 11: X-ray showing use of NEXT reinforcing obturators.



Figure 7: Fibrefill (Pentron) post/obturator.



Figure 8: Post-op X-ray of post obturator in place.



Figure 9: NEXT (Heraeus Kulzer) continuous tapered post/obturator.

(Figures 4, 5). Dye leakage studies conducted at the University of Indiana and University of Pennsylvania also support the ability of this resin obturation system to cause an efficacious seal.¹⁷

Numerous studies have suggested that the bonding of a resin/fiber post in the canal with dentin bonded resin cement may increase the resistance to vertical root fracture of the weakened endodontically treated tooth.^{19,20,21} This concept is in direct contradiction to the effect that cast post and cores and the screw-type posts have on the root. Ferrari et al. found that of 100 teeth restored with cast posts and cores and tracked for four years, 9% had experienced vertical root fracture.²² Z. Fuss et al. found in a 2001 study that post placement with screw posts of the Dentatus type and tapered cast posts were the major etiological factors for root fractures.²³

Whereas posts were utilized in the past to solely support the core, Marco Ferrari, M.D., D.D.S., Ph.D., at the University of Sienna, found that the new post/obturators, in combination with the bonded resin sealer, can help to strengthen the root against fracture by 70% over endodontically treated teeth with no posts.²⁴

At the University of Indiana, 120 extracted central incisors were divided into eight groups, with two groups assigned to one of four post techniques: 1. Fibrekor post (a resin/fiber post); 2. Para-post; 3. Cast post and core; 4. Fibrefill post/obturator (resin/fiber post with gutta-percha attached to the post). All the teeth received crowns and then were tested for both fracture resistance and fracture resistance after fatigue loading. The conclusion of the study was that the teeth obturated and restored with the Fibrefill post/obturator have significantly higher resistance to fracture than Fibrekor posts, para-posts and conventional cast post and cores.²⁵ The post/obturators are available in a straight post configuration utilizing a peeso reamer for the post hole (Figures 6,7,8) and also a continuous tapered style that follows the taper of either .02 or .04 files (Figures 9,10,11).

The need for ferrules is affected by the type of post utilized in the restoration of pulpless teeth. In 1961, Rosen defined ferrule as "a subgingival collar or apron of gold that extends as far as possible beyond the gingival seat of the core and completely surrounds the perimeter of the tooth. It is an extension of the restored crown, which, by its hugging action, prevents the shattering of the root." Several studies testing the effect of the bonded resin fiber post have suggested that the ferrule is not needed when the bonded resin fibered post is utilized in the restoration of pulpless teeth. Saupe et al., in a 1996 study, found that "resin reinforcement significantly increased the resistance to fracture, but the use of the ferrule collar in the resin-reinforced group was found to be of no benefit."²⁶

The application of advancements in the hybridization of dental hard tissues, using biocompatible resin applied to the obturation of root canals, shows great promise in effecting superior seals of all portals of exit of the root canal system. In addition, this technology supports the long-term success of the endodontic therapy by creating an immediate definitive coronal seal that will prevent crown-down coronal reinfection.

These new materials and techniques may also help to prevent disastrous vertical root fracture by strengthening the root.

Finally, the use of resin fiber extensions from the canals into the cores augments the restorative procedures by aiding in the retention of the core. ■

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Ameloblastic Fibrodentinitoma

[A Case Report]

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Abstract:

A case report of an ameloblastic fibrodentinitoma (AFD) in a 21-year-old female patient is presented. This rare, benign tumor was surgically treated. The histological findings and follow-up are presented.

Ameloblastic fibrodentinitoma (AFD) is a rare, benign odontogenic tumor composed of neoplastic odontogenic epithelium and odontogenic mesenchyme with dentin or dentin-like tissues.¹ It has also been called dentinoma or fibroameloblastic dentinoma.² AFD is a slow growing, often asymptomatic tumor; and it may enlarge to an extreme size. Radiographically, it shows a fairly well-delineated radiolucency, with varying degrees of radioopacity.²

In this case report, surgical treatment, histological findings and one-year follow up of the huge AFD is presented.

Case Report

A 21-year-old female patient was referred to the Department of Oral and Maxillofacial Surgery. She complained of mild swelling, which occurred approximately a year earlier, after the eruption of the left mandibular third molar. The patient did not seek treatment for six months, during which time, the swelling exacerbated.

The dentist planned to extract the third molar following appropriate antibiotic therapy. Intraoral examination showed that there was a hypertrophic and vascular lesion, which extended from the ramus of the mandible to the foramen mentale. The second and

third molars, which were associated with the lesion, showed moderate luxation.

Radiographs showed a multilocular, soap bubble-like radiolucency in the left mandibular posterior region. This radiolucent area extended from the root of the second premolar to the mandibular ramus. The roots of some neighboring teeth showed resorption (Figure 1).

The first cytologic finding was benign. The second cytologic finding was compatible with ameloblastoma. Under general anesthesia the mass was excised in total, and the left second premolar, left second and third molars were extracted (Figure 2). The diagnosis on the third examination was AFD.

Histological Findings

The mass was composed of tumoral tissue that consisted of fibroblastic and cellular stroma. The stroma consisted of ameloblast cell islands and dentinoid-like cells similar to hyalinized eosinophilic material. There was no cellular atypia, and there were no symptoms of a malignant lesion.

Discussion

Ameloblastic fibrodentinitoma arises mainly in the posterior mandible (maxilla-mandible ratio 1:3) and usually in association with the unerupted molar teeth of young adults, adolescents and children.³⁻⁹ It is more common in males than females, and affects people younger than 30 to 35 years of age.⁴ Some investigators say ameloblastic fibrodentinitoma, as a rule, is related to an impacted

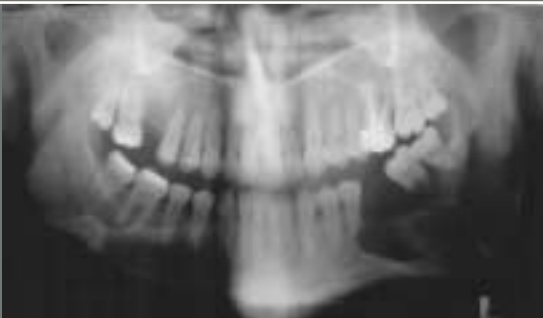


Figure 1. Preoperative radiography of patient.



Figure 2. One-month postoperative radiography.



Figure 3. One-year postoperative radiography.

tooth. In our case, the patient was affected for this tumor.^{4,6,9} Akal et al., Anker and Radden say the AFD has significant potential for growth.^{3,5}

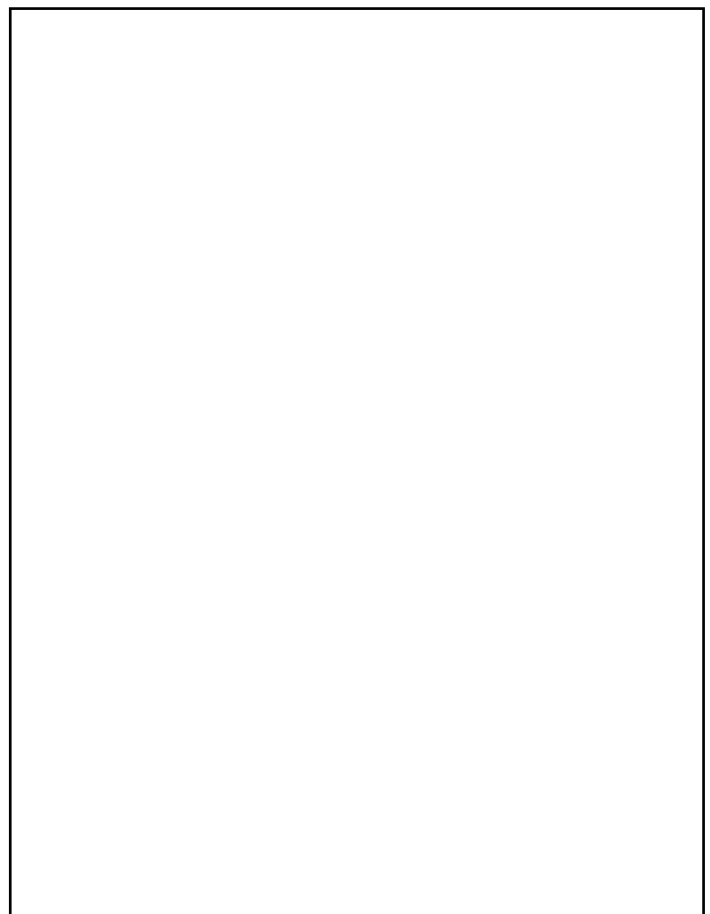
In the case presented here, the lesion of the left mandible area decorticated the mandible in less than one year and grew excessively.

In the oral examination, the lesion seemed to be a vascular pathology, but the histologic findings didn't support this clinical impression. There was an anastomosis with ameloblastic cell island in stroma and eosinophilic material reminiscent of dentinoid material. Enamel matrix was not present in the specimen.

One-year follow-up of the patient shows no recurrence (Figure 3). ■

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Impacted Permanent Maxillary Canines

Diagnosis and Treatment

Armin Abron, D.D.S.; Ryan L. Mendro, B.S.; Selma Kaplan, D.M.D.

Abstract

Palatally impacted permanent maxillary canines are a relatively common dental anomaly of unknown etiology. Early diagnosis of these impactions and subsequent intervention reduce the risk of further complications and may even remedy the impactions. Additionally, several surgical techniques can be used to resolve the impactions when intervention is not sufficient. An understanding of effective diagnosis and treatment of these impactions is imperative to the health and well-being of the teeth and supporting periodontium.

THE PERMANENT MAXILLARY CANINE is considered impacted when its eruption is retarded or halted. Maxillary canine impaction is diagnosed by clinical and radiographic findings that no spontaneous eruption can be expected.¹ Normally, in the mandible, the eruption sequence of the permanent dentition follows an anterior-to-posterior pattern. However, in the maxilla, eruption of the premolars follows the incisors; the canines are then expected to erupt into the dental arch at 10 to 12 years of age (Table 1).

The normal eruption path of maxillary canines can be altered as a result of a variable eruption sequence in the maxilla and by limited space conditions, such as crowding. Early diagnosis and treatment of this condition is essential to reduce the risk of other tooth eruption disturbances. Optimal management of impacted permanent maxillary canines involves an interdisciplinary approach, combining the specialties of periodontology and orthodontics.

Prevalence

Permanent maxillary canine impactions occur in 1% to 2% of the general population, second only to the impaction of third molars in frequency.²⁻⁴ These impactions occur twice as often in women than men, and five-times more often in Caucasians than Asians.^{5,6} In about 85% of these cases, the impacted teeth are located palatal to the dental arch; in the remaining 15% of cases, the impactions are located facially.^{4,7,8}

Etiology

The etiology of impacted maxillary canines remains unknown. Primary causes associated with this condition are: the rate of root resorption of the deciduous teeth; trauma to the deciduous bud; disturbances in tooth-eruption sequence; availability of space;

TABLE 1
Average Age of Eruption for Permanent Teeth in Years

	Maxilla	Mandible
Central Incisor	7 - 8	6
Lateral Incisor	8	7 - 8
Canine	10 - 12	9 - 10
1st Premolar	10 - 12	10 - 12
2nd Premolar	10 - 12	12
1st Molar	6	6
2nd Molar	12	12

Note that in mandible, eruption sequence of permanent dentition follows anterior-to-posterior pattern. However, in maxilla, eruption of premolars follows incisors, after which, canines are expected to erupt into dental arch, at approximately 10-12 years of age.

rotation of tooth buds; premature root closure; and canine eruption into cleft areas.

Secondary causes of impaction include, febrile diseases, endocrine disturbances and vitamin D deficiency.⁹

Two theories have been proposed to explain this dental anomaly: the guidance theory, and the genetic theory. The guidance theory of canine displacement suggests that this anomaly is the result of local factors and conditions, such as congenitally missing lateral incisors, supernumerary teeth, odontomas, transposition of teeth and other mechanical determinants that may interfere with the normal path of eruption.¹⁰ Maxillary canines usually develop high in the maxilla, are among the last teeth to erupt, and must course a considerable distance before erupting. Consequently, there is an increase in the potential for mechanical disturbances, resulting in the canines' displacement and subsequent impaction.

The second theory implicates genetic causes in the impaction of canines. Palatally impacted maxillary canines are often associated with other dental abnormalities, such as tooth size, shape, number and structure, all of which have been found to be genetically linked.¹⁰ The anomalies are thought to arise in embryonic development from a shared hereditary trait.¹¹ Evidence for this includes the fact that palatal impactions occur in conjunction with other dental anomalies, such as crowding, and often occur bilaterally.¹² Furthermore, gender differences are apparent, as well as familial and population differences.

Canines play a role in functional occlusion and form the foundation of an esthetic smile. As such, any factors that interfere with the normal development of canines and their eruption can have serious consequences. Possible sequelae of canine impaction include root resorption of impinging teeth, referred pain, infection, dentigerous cysts and self-resorption.

Diagnostic Methods

Patients should be examined by 8 or 9 years of age to determine whether canines are erupting in a normal position, and to assess whether the potential for impaction exists. Early detection may reduce treatment time, complications, complexity and cost. The presence and position of the canines can be investigated by three simple methods: visual inspection, palpation and radiography.

Visual evidence of impaction can be observed in an over-retained primary canine. Possible signs of impending impaction include: lack of canine prominence in the buccal sulcus by age 10; discordance between the exfoliation of the deciduous canine and eruption of permanent canine; and the presence of distally displaced lateral incisor crowns. All of these findings are indicative of a palatal eruption path of maxillary canines and potential impaction.

Bidigital palpation of the maxillary canine region from labial vestibule and palatal roof is also useful for the localization of impacted canines. Canines are readily detectable one to one-and-a-half years prior to eruption. It should be noted, however, that asymmetries in the alveolar processes of young children might not always be indicative of canine impaction, but may be due to vertical differences in eruption.

Palatally impacted canines are often located over the roots of central and lateral incisors, or are found high in the roof of the mouth in a horizontal position.¹³ Palpation alone may not be successful in locating these impactions. Therefore, radiographic localization should be implemented if bidigital palpation is inconclusive. An initial panoramic radiograph for overview of the mandible and maxilla, followed by one or two periapical radiographs of the canine area, in conjunction with a clinical examination, can be used to diagnose an impacted canine.

Using the parallax method introduced by Clark in 1910, known as Clark's Rule, or, the Buccal Object Rule, the directional displacement of impacted canines can be radiographically assessed. With the Buccal Object Rule, two periapical films are taken of the same area, the second one with a different horizontal angulation, either mesially or distally displaced. If the object in question (impacted canine) is transposed onto the second film in the opposite direction to the change of the horizontal angulation, it is situated closer to the source of radiation, and is, therefore, located buccally. If the object appears to move in the same direction as the change in horizontal angulation, the object is situated lingually or palatally (same lingual, opposite buccal = SLOB).

Computed tomography (CT) can also be used to visualize an impaction. CT is a technique that uses a series of radiographic axial sections to produce a computer-generated three-dimensional image. It is the most precise method of radiographic localization; however, its use is currently limited by cost and increased radiation exposure.¹² Radiographic evaluation is used to verify the presence



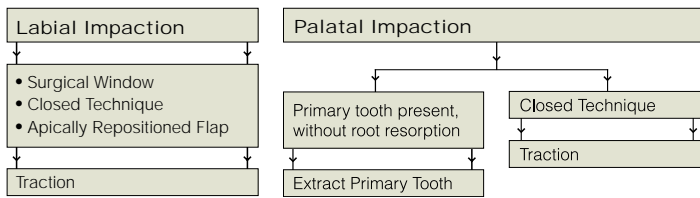


Figure 1: Management of Impacted Maxillary Canines. Surgical techniques are aimed at facilitating eruption of impacted canine with minimal damage to tooth and adjacent structures. Surgical techniques include gingivectomy or surgical window, closed eruption technique, and placement of apically repositioned flap.

and location of an impacted tooth; it also aids in examining the anatomy of the areas adjacent to the impaction, which may play a critical role in treatment planning.

Treatment

The specific surgical procedure and orthodontic mechanisms used to treat impacted canines will vary depending upon the degree of impaction, the horizontal overlap of the impacted tooth, the canine angulation and localized crowding.

Additionally, the age at diagnosis may affect treatment. Studies have shown that the extraction of primary canines at 10 to 13 years of age may resolve the palatally impacted permanent canines in approximately 60% to 80% of cases, when local space conditions are favorable.¹⁴ However, this treatment does not necessarily eliminate or ensure correction of the problem; therefore, surgical intervention should be implemented if desired results have not occurred within one year of the deciduous extraction.¹⁵ Often, maxillary canines that are displaced palatally will not erupt without orthodontic treatment because of the denser palatal bone, thicker palatal mucosa and increased horizontal angulation associated with these impactions.¹⁶



Figures 2A-2C: Surgical Window (Gingivectomy). Indicated for shallow, labial maxillary canine impactions. Semilunar flaps are implemented for access and visualization.



Figures 3A-3C: Maxillary Impacted Canines. Are usually located over roots of laterals and central incisors or horizontally high in roof of mouth.

Other studies have addressed horizontal overlap in reference to the canines and lateral incisors.^{15,17} The chance of canine impaction recovery is poor when the horizontal overlap of the primary maxillary canine root is more than one-half of the width of the lateral incisor root. An achievement of 91% resolution for palatal impaction has been reported in cases where the crown of the canine is distal to the midline of lateral incisor when treatment was initiated. In contrast, the success rate was reported to be less than 64% when the canine crown is mesial to the midline of the lateral incisor.¹⁷

Overview of Management

Surgical techniques are aimed at facilitating the eruption of an impacted tooth with minimal damage to the tooth and adjacent structures. Surgical techniques include gingivectomy or surgical window, the closed eruption technique, and the placement of an apically repositioned flap (Figure 1).

A surgical window or gingivectomy can be implemented for shallow, labial maxillary canine impactions close to the alveolar crest or when a broad band of keratinized tissue is present.¹³ Implementing the window approach involves resecting a full thickness flap, then repositioning the flap back with a fenestration being opened on the area of the crown.¹⁸ The tooth may erupt normally once the soft tissue obstruction is removed, and in such instances, orthodontic treatment may not be required.

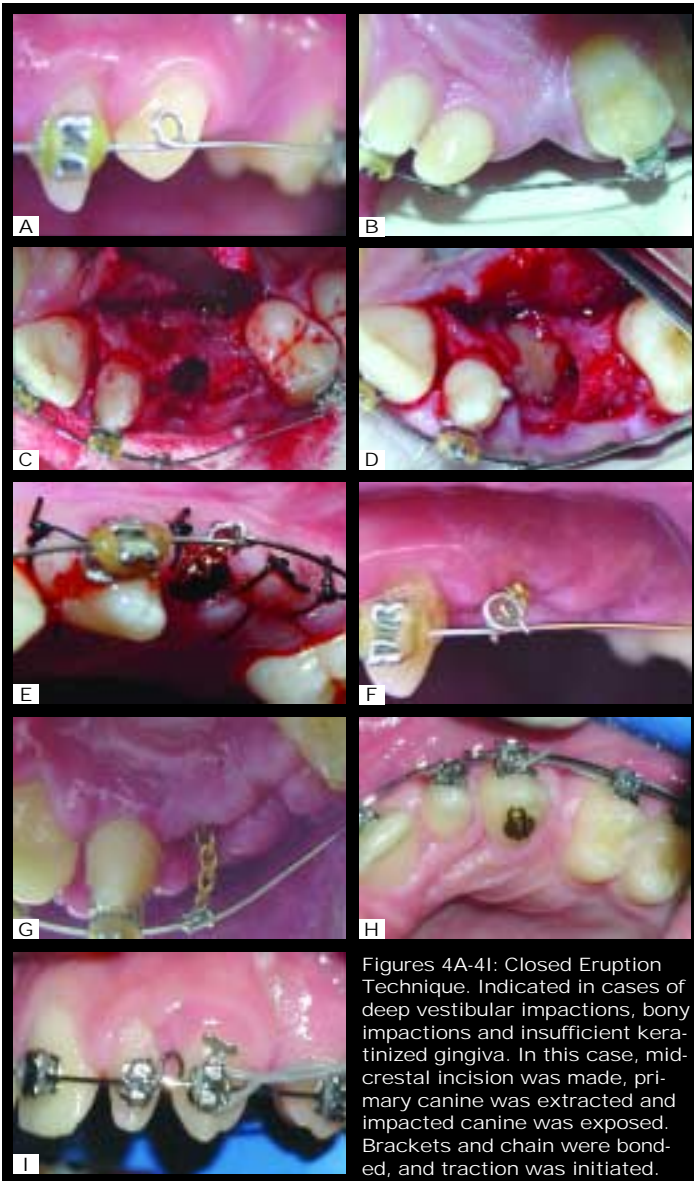
A gingivectomy procedure is indicated when one-half to two-thirds of the crown can be uncovered, leaving at least 3 mm of gingival collar. In most instances, the tip of the impacted tooth is near to the cemento-enamel junction of the adjacent tooth. This technique is simple, but it sacrifices attached gingiva¹⁸ (Figures 2A-2C).

A closed eruption technique is indicated if the tooth is impacted in the middle of the alveolus, near the nasal spine, high in the vestibule or in the palate¹⁹ (Figures 3A-3C). First, a flap is reflected over the area of the impacted tooth. Next, the crown is exposed, and an orthodontic attachment is bonded to it. A traction wire is placed onto the attachment. Subsequently, the flap is closed over the crown, exposing only the traction wire to the oral cavity. Lastly, the traction wire is connected to an arch wire, which is positioned by the expected forces needed to erupt the impacted tooth.¹³ Disadvantages to this technique include that once the flap is closed, direct inspection of the tooth is impossible. Moreover, it is difficult to iso-

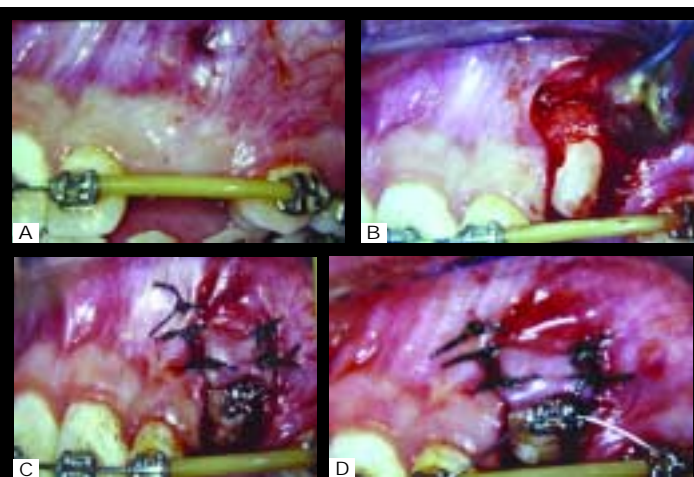
In any surgical procedure, the manner in which the soft tissue is handled ultimately affects the results of the treatment.

late the area; and studies have shown a longer eruption time compared to procedures used in open techniques¹⁸ (Figures 4A-4I).

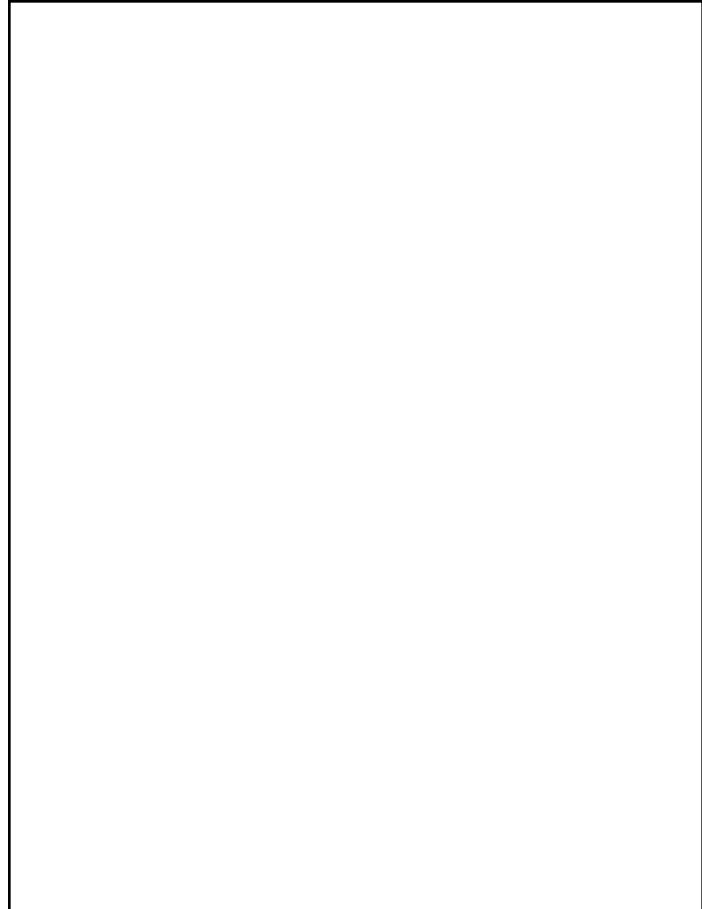
An apically repositioned flap can be placed when a gingivectomy will not leave enough attached gingiva to maintain a sound periodontium. This technique is indicated when the tooth is apical or lateral to the edentulous area but is used primarily for labial impactions due to the inability to apically reposition the palatal tissue. The flap is constructed so that there are vertical excisions adjacent to the distal of the lateral incisor and the mesial of the first premolar and a horizontal incision connecting the two. Next, the crown of the impacted tooth is located and the flap is secured back into place apically so that the crown remains exposed in the oral cavity. If necessary, a bracket can then be placed on the erupting tooth to orthodontically guide it into position.¹³ This is a quick and simple procedure that allows accurate control and helps to maintain the mucogingival complex; however, this technique can not be used when the tooth is positioned high in the palate¹⁸ (Figures 5A-5D).



Figures 4A-4I: Closed Eruption Technique. Indicated in cases of deep vestibular impactions, bony impactions and insufficient keratinized gingiva. In this case, mid-crestal incision was made, primary canine was extracted and impacted canine was exposed. Brackets and chain were bonded, and traction was initiated.



Figures 5A-D: Apically Repositioned Flap. Vertical incisions are made into vestibule; and horizontal incision is created from premolar to lateral incisor. Note exposure beyond CEJ may result in greater loss of attachment after orthodontic therapy. Bracket is placed, and flap is secured apically. Orthodontic therapy can be initiated at first postoperative visit.



Complications

In any surgical procedure, the manner in which the soft tissue is handled ultimately affects the results of the treatment. Potential complications involving the soft tissue include attachment loss, recession and gingival inflammation.

Vertical relapse, intrusion of adjacent teeth, root resorption and debonding of brackets are other complications that may occur from impacted maxillary canine treatment. Furthermore, studies have shown that ankylosed teeth can cause adjacent teeth to tip in the space provided by the impaction.²⁰

Conclusions

Pediatric dentists and general practitioners should familiarize themselves with this dental anomaly and be trained to detect teeth at risk for impaction. Early diagnosis and subsequent precautionary measures, such as primary canine extraction, may prevent further complications and spare patient time, expense and complex treatment procedures. It can be further noted that if the surgical exposure of an impacted tooth is necessary, only a minimal amount of bone should be removed to protect and maintain the supporting periodontium. ■

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The Attachment-Retained Overdenture

George E. Bambara, M.S., D.M.D.

Abstract

Attachments are rigid or resilient connectors that redirect the forces of occlusion. Attachments have been used in dentistry for more than 100 years, and have provided dentists with a means for protecting weak abutment teeth, preserving soft tissue, maintaining physiologic occlusion and enhancing patient satisfaction and comfort.

AN OVERDENTURE is a complete denture supported partly by soft tissues and partly by retained natural teeth roots or implants. The advantages of overdentures compared to total extraction and fitting of a conventional denture with completely edentulous ridges are well documented and extremely beneficial to the patient. They include the following:

1. The alveolar bone in the area of retained roots may be preserved from resorption.
2. The retained roots provide positive support for the denture and, thus, shield the edentulous ridge from traumatic pressures while increasing crown/root ratios.
3. The retained roots provide normal tactile sensations of pressure to the periodontal ligaments, known as proprioception.
4. Because of superior support and tactile sensation, masticating ability with an overdenture is usually greater than with a conventional denture.
5. The patient's physiological dimension is maintained through the preservation of teeth and bone.
6. The preservation of even a single root has a significant psychological advantage for some patients, who now do not have to consider themselves totally edentulous.
7. The retained roots often result in greater stability for the denture.

Overdenture fabrication is an alternative to the conventional complete denture and is not a substitute for fixed bridgework or partial dentures when they are indicated. Overdenture treatment does provide a way of using teeth that would otherwise be lost to extraction because alone they could not support fixed or removable partial dentures. While a typical overdenture does have more stability than the conventional complete denture, increased retention is not always one of its advantages.

It is obvious that overdenture fabrication is a viable and useful alternative to complete dentures and should be used whenever possible to obviate complete edentulism.

In a study by Rissin and House, which was done to determine whether the proprioception inherent in overdenture patients gives them functional advantages over complete denture patients, overdenture patients scored 20% higher in masticatory performance than complete denture patients.⁶

In another study, Tallgren observed that the average reduction of anterior mandibular ridge height was 9 mm to 10 mm over a 25-year denture-wearing period. Reduction of the maxillary ridge during this same period amounted to 2.5 mm to 3 mm.⁷

Carlsson and Persson found that in the removal of teeth and the placement of dentures, the mandible lost 4 mm in height during the first year and that the resorption increased to 5 mm after two years and 6.7 mm in five years.⁸

Finally, Daniel Epstein, D.D.S., a friend and colleague, who has devoted much of his professional life to overdenture fabrication and education, has concluded, "There is an immediate and continuing loss of bone for the life of the patient when the mandible is made edentulous."⁹

We, as practicing dentists, experience this every day when we look in the mouths of patients who are partially or totally edentulous. The loss of bone height and width, the pencil thin ridges, the drooping saddle areas are a sad commentary on the dental health of the individual and to the fact that dentistry failed to get across its message that in this life, teeth are important.

Attachments and Overdentures

Overdenture attachments are often used in overdenture construction by either connecting the attachments to cast root copings or cementing female attachments into the prepared post space of the abutment teeth. The male component is usually retained in the acrylic.

Overdenture attachments are classified as either studs, which connect the prosthesis to the individual roots, or bars, which connect the appliance to the splinted roots. These attachments are either rigid or resilient; however, since edentulous ridges and remaining roots are often compromised, the prosthesis that relies on resilient attachments is better able to divert occlusal forces away from weak abutment teeth and allow for more ridge support. Stronger roots with increased crown/root ratios can bear more of an occlusal load. These should be treatment planned for a more solid or rigid attachment that would allow the teeth to be more functional under occlusal load. Most attachments are also available for implant configurations for use in implant-supported overdentures.

Overdenture attachments can be extracoronal, where the attachment sits outside the confines of the root, or intracoronal, where the attachment sits within the confines of the root. The extracoronal type can be cemented directly to the root or cast onto a coping. These attachments decrease the crown/root ratio slightly since they increase the root structure above the level of bone.

The intracoronal attachments, like the Sterns Root Anchor (*Sterngold*) or the ZAAG attachment (*Zest Anchors*), fit within the root canal itself, thus, lowering the rotational center of the tooth and offering a more favorable crown/root ratio. They are favored when weak abutment teeth are to be used in overdenture construction (Figures 1, 2). The Zaag attachment shown in Figure 2 is used as an intra-bar attachment, adding resiliency and retention to a rigid connector.

The choice between using individual stud attachments on implants or connecting the implants and attachments together through a bar design is determined by philosophy and by assessing retention, support, stabilization, bone and splinting requirements for the prosthesis.

Although splinting natural teeth and abutments has proven beneficial, current research shows that the splinting of implants



Figure 1. Sterns Root Anchor (*Sterngold*).

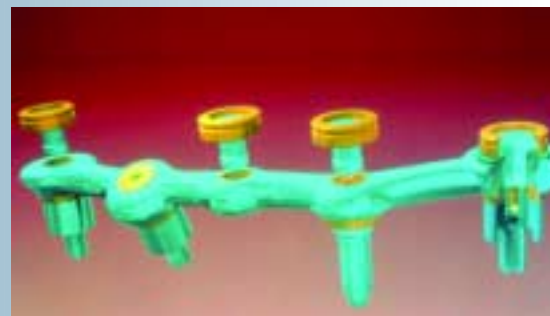


Figure 2. Zaag Attachment (*Zest Anchors*).

in overdenture fabrication is deemed questionable in certain situations. Further studies are required, as nothing conclusive has been established or agreed upon that would alter our treatment planning now.

Advantages of Attachment-Retained Overdenture

The attachment-retained overdenture has all the advantages of the overdenture and has proven to be more beneficial for the following reasons:

- **Redistribution of Traumatic Forces** – Attachments can provide mechanical resiliency, which allows for redirection of traumatic forces.
- **Minimize Trauma to Soft Tissue** – Proper attachment selection is very important. Knowing the various types of attachments and their functionality allows us to plan for hard and soft tissue preservation, patient comfort and satisfaction. Refer to the attachment functional classification chart for details on attachment selection.
- **Control of Loading and Rotational Forces** – Minimizing torque on abutment teeth and directing forces along the long axis of teeth is critical in planning long-term prosthetic success. Periodontal compression, orthodontic tooth movement and/or implant overloading are all undesirable. Proper attachment selection can avoid potential problems.



Figure 3. O-Ring System (Attachments International).



Figure 4. Preci-Clix (Preat Corp.).



Figure 5. Locator (Zest Anchors).



Figure 6. ERA (Sterngold).

The incorporation of attachments in overdentures takes the simple overdenture to another level by providing superior esthetics, enhancing proprioception, adding mechanical retentive properties, increasing crown/root ratios and attenuating ridge resorption.

- **Non-Parallel Abutments** – Overdenture attachments can be placed directly by the dentist or can be cast or soldered to copings made by the laboratory. Many of the attachments that are directly placed by the dentist come in a variety of angulations to correct path of insertion discrepancies that accompany misaligned or periodontally compromised teeth.
- **Retention** – Varies depending upon attachment used. Most overdenture attachments have mechanisms to vary retention. Retention values can be anywhere from one to five pounds

The incorporation of attachments in overdentures takes the simple overdenture to another level by providing superior esthetics, enhancing proprioception, adding mechanical retentive properties, increasing crown/root ratios and attenuating ridge resorption.

At least 5 mm of bone is necessary to support the root of an abutment tooth that will be used for overdenture construction.

Functional Classification

Solid: Class 1A—solid, rigid, non resilient; Class 1B—solid, rigid, non-resilient with a locking U-pin or screw.

Resilient: Class 2—vertical resilient; Class 3—hinge resilient; Class 4—vertical and hinge resilient; Class 5—rotational and vertical resilient; Class 6—universal, omniplanar.

As you can see, attachments become more resilient as you go from a Class 2 to a Class 6. Class 6 attachments place virtually no stress on the remaining root and only act as retentive devices. The prosthesis is totally tissue-supported. An example of an attachment that acts passively on a remaining root and is totally tissue-supported is the ORS, or, O-ring system. It is considered to be a Class 6 type, and will provide a superior amount of retention and patient comfort (Figure 3).

When roots are adequately supported in bone, with good crown/root ratios, rigid or less-resilient attachments can be used to divert occlusal forces from the soft tissues and onto the remaining and functioning roots.

A good example of an attachment that can be used in this situation is the Preci-Clix (Preat Corp.) This attachment is considered to be a Class 3, and allows for rotational movements around a ball. Since there is no vertical resiliency, occlusal forces are shared by the roots and the supporting tissue (Figure 4).

With roots that are compromised, a more stable attachment may be selected that offers a wider seating platform as well as movement in a vertical and rotational direction. Attachments like the Zest Locator, the Sterngold ERA or the Bredent VKS Resilient

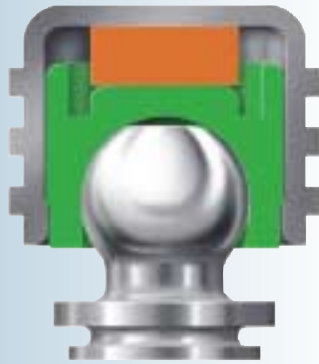


Figure 7. VKS Resilient Matrix (Bredent USA).

Matrix provide up to 4/10 mm of vertical tissue compressive movement before the root bears the full occlusal load (Figures 5-7). These attachments can be considered to be of the Class 5 type.

Overdentures usually are planned over teeth that are generally compromised. After root canal therapy and decoronation, a better crown/root ratio is achieved, creating a stable and supportive proprioceptive base over which to fabricate an overdenture. Attachments, because of their resilient or rigid properties, can redirect occlusal forces away from weak supporting roots and onto soft tissue, or redirect occlusal forces more toward stronger roots and away from the soft tissues. Attachments act as shock absorbers and stress redirectors as well as providing superior retention.

The incorporation of attachments in overdentures into our everyday dental practice will open up another dimension in dental treatment planning and patient comfort and satisfaction. Teeth that might be considered for extraction may now be considered as long- or short-term alternatives to implants or partial or total edentulousness. ■

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Resources for Children's Dental Health Month Available Online



RESOURCES for the NYSDA Children's Dental Health Month program in February will be online, with activities, patient fact sheets, slide shows and event information posted on the NYSDA Web site, www.nysdental.org.

NYSDA will invite children in preschool through 12th grade to take part in its popular "Keeping Smiles Brighter" creative contest. Younger children will be asked to design a T-

shirt with an oral health message. And older children will be challenged to come up with a title and cover design for a video or board game about dental health. Contest rules can be downloaded directly from the NYSDA Web site.

Give Kids a Smile!®, an ADA initiative aimed at building support for expanding access to oral health care, will be observed Friday, Feb. 4. Check with your local district about events planned in your region.

NYSDA's "Sugarless Wednesday," a day dedicated to increasing the awareness of added sugars in our diet, will be observed Feb. 9. Free "Sugarless Wednesday Survivor" stickers are available from NYSDA.

The month-long activities are coordinated through local district offices. All components say they need volunteers to carry out planned events. If you would like to take part in public presentations, screenings or class visits, get in touch with your local district office or the Children's Dental Health Month chair listed at right.

Materials will be posted on the NYSDA Web site in late December.

For more information about Children's Dental Health Month activities, call the number listed for the person coordinating activities in your area.

New York County

Dr. Moon Bina Park
11 Fifth Ave., #C
New York, NY 10003
(212) 477-3871

Second District

Dr. Reneida Reyes
1 Hanson Place, #2204
Brooklyn, NY 11243-2910
(718) 230-0380

Third District

Dr. Christopher Walsh
1829 Western Ave.
Albany, NY 12203
(518) 456-5131

Fourth District

Dr. Vincent Filanova
6 Mohawk Place
Amsterdam, NY 12010
(518) 842-2611

Fifth District

Dr. Scott Day
354 E. Main St.
Gouverneur, NY 13642
(315) 287-4000

Sixth District

Dr. Gary Bigsby
609 E. Main St., Medical Arts
Endicott, NY
(607) 754-3080

Seventh District

Dr. Kimberly Richards
4415 Buffalo Rd.
North Chili, NY 14514
(585) 594-9177

Eighth District

Dr. Edwin Tyska
9650 Main St.
Clarence, NY 14031
(716) 759-8323

Ninth District

Dr. Wayne Turk
777 White Plains Rd.
Scarsdale, NY 10583
(914) 472-9090

Nassau County

Dr. Peter Blauzvern
366 N. Broadway
Jericho, NY 11753-2032
(516) 681-5800

Queens County Dental Society

Dr. Karen Lewkowitz
55-15 Little Neck Parkway
Little Neck, NY 11362
(718) 229-5924

Suffolk County Dental Society

Dr. Ross Gruber
285 Sills Rd., Ste. 3-B
E. Patchogue, NY 11772
(631) 289-9000

Bronx County

Bronx County Dental Society
3201 Grand Concourse
Bronx, NY 10468
(718) 733-2031

Reference Materials Aid Educational Efforts

IF YOU NEED ASSISTANCE with your presentations to young audiences during Children's Dental Health Month—or other times throughout the year—NYSDA offers a variety of dental health education materials to its members. All the items listed below can be accessed through the NYSDA Web site beginning in late December. As an alternative, they can be requested from NYSDA.

- **“Healthy Teeth Keep Smiles Happy”**: Slide show (also available on CD). Suitable for primary grades. Colorful, easy-to-view slides that focus on purpose of teeth, care, cleaning and diet.
- **“Oral Piercing—You Decide”**: Slide show (also available on CD). To supplement teen presentation. It's hip, but how healthy? Includes infection risks, impact on health and speech, and encourages teens to speak with a dentist before deciding.
- **Patient Fact Sheets**: Assortment of topics, prevention, procedures, tobacco use, diet.
- **Activity/Worksheets**: Puzzles, brushing calendar, word searches for children in primary grades.
- **Sugarless Wednesday Fact Sheet**: Ideas for activities to use during the school day in art, math, science, English, cafeteria, etc.
- **Tips for Teachers**: Fact sheet on New York State events, resources and contact information.

NYSDA has other dental health educational material that it is making available to members upon request to the Association office. They include Sugarless Wednesday “Survivor” Stickers and “Protect Your Baby's Precious Smile,” a four-color brochure for parents and caregivers that is printed in both English and Spanish.

And the NYSDA Lending Library has videos for loan that dentists will find helpful when making public presentations. They include:

- **“Protect Your Winning Smile: The Importance of Wearing a Mouthguard”**: An 11-minute, VHS presentation, suitable for ages 5 and up. Comes with guidebook for dentist presenting the program.
- **“Dental Health: A Guide for African-Americans”**: VHS format; 30 minutes long. Features celebrities Blair Underwood and Nia Long.
- **“Dentistry, A Unique Profession”**: VHS format; 11 minutes long. Produced by the American Dental Association.

To request materials, get in touch with Nancy Habel at NYSDA: (800) 255-2100, ext. 261; nhabel@nysdental.org.

February is National Children's
Dental Health Month

A Healthy Smile is Always in Style



Brush and floss each day.
Eat nutritious foods.
Have regular dental checkups.

ADA.

American Dental Association
www.ada.org

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