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# Periodontal and Soft Tissue Prevention Strategies for the Adolescent Dental Patient

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As children mature into adolescents, physical and intraoral changes occur as a result of the combined effects of genetic composition, proper nutrition, growth hormone increases, and sex hormone fluctuations. Adolescent health issues involve physical body changes, psychologic development, and participation in high-risk behaviors. Some physical body changes typical of this developmental period include the ability to sexually reproduce, an increase in muscle mass, and the development of eating disorders. From a psychologic perspective, some major adolescent concerns include coping with peer pressure, developing higher intellect, and understanding health, disease, and its prevention. Experimentation with high-risk behaviors such as the initiation of sexual activity, substance abuse (illicit drugs and alcohol), as well as tobacco use and body art initially appear during adolescence [1]. Because all of these issues directly or indirectly may affect oral health, and especially periodontal and soft tissue health, adolescents may present the dentist with a more complex challenge to oral health care delivery [2].

The adolescent dental patient has distinctive dental needs because of potentially increased risks for dental caries, traumatic injuries, and periodontal disease, as well as a tendency for poor nutritional habits and risky behaviors such as tobacco and drug use and sexual activity [3–7]. All of these factors may contribute to a more complex management of the adolescent's dental care. Although many adolescents living in the United States today may have experienced a decline in the incidence and severity of dental caries because of the benefits of fluoridated water and dentifrices, adolescents need to

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understand the importance of good oral hygiene and its relationship to periodontal health, as well as overall good general health. The dentist is in a unique position among health care professionals in guiding the adolescent's oral health care because of the frequent dental recall intervals that occur over time. As a result, the adolescent has more opportunities to discuss the physical, psychologic, and high-risk behavioral issues with a dental practitioner. Therefore, the dentist must have knowledge of the cause, symptoms, and manifestations of periodontal disease and soft tissue lesions in the adolescent patient and be able to apply the principles of anticipatory guidance to the patient's dental care. This article provides and enhances the dental practitioner's knowledge with current, clinical information regarding periodontal and soft tissue prevention strategies designed specifically for the adolescent dental patient.

# Periodontal diseases and soft tissue conditions

Periodontal disease, both reversible and irreversible, becomes more prevalent during adolescence. According to the most recent Surgeon General's report on oral health, irreversible tissue damage from periodontal disease appears in late adolescence or early adulthood [7]. Epidemiologic data along with research protocols have indicated an age-dependent relationship in the development of gingivitis and its rate of progression [8,9]. Sex hormone changes that affect the host–parasite interactions of the periodontal structures, increased blood vessel permeability, an exaggerated response to microorganisms, and lack of attention to proper oral hygiene all contribute to an increased prevalence of periodontal disease during this developmental period [11,12]. Thus, it is preferable for the dental health team to initiate primary preventive strategies for their teenage patients rather than to be compelled to treat or manage subsequent periodontal disease.

#### Acute gingival conditions

# Gingivitis

Gingivitis, a reversible periodontal disease characterized by inflammation of the gingival tissue without accompanying bone loss, is common among adolescents and may affect nearly everyone at some time [13]. In the total absence of oral hygiene, young children tend to develop gingivitis more slowly than adolescents and adults [8–10]. The reasons for this age-related difference are not understood completely. Even though increased subgingival levels of *Actinomyces*, *Capnocytophaga*, *Leptotrichia*, and *Selenomonas* species have been detected in children who participated in experimental gingivitis studies, gingivitis in children does not develop as severely as it does in adults [14]. Several researchers have suggested that age-related differences may be explained by differences in the amount of plaque accumulation [15]. However, when other studies compared similar amounts of plaque in patients of various ages, the results indicated that other factors such as hormonal influences and gender differences may be involved [16].

Hormonal influences play a role in the development of gingivitis in adolescents. Adolescent hormonal imbalances combined with the bacteria present in the gingival sulcus cause an exaggerated response to local irritants and increase the bleeding tendency [17]. Whereas female adolescents generally have demonstrated better oral hygiene practices than male adolescents, the incidence and severity of puberty gingivitis are more pronounced in females [18]. As the female adolescent progresses to adulthood, the severity of the puberty gingivitis decreases as long as the local irritants have been removed and proper oral hygiene is maintained. In addition, some females may experience a transient gingivitis appearing several days before the menstrual period. Typically, this condition resolves on its own after the onset of the menstrual period [19].

Because the adolescent's focus usually is reflected inward to the "self," the teenager typically enjoys and responds well to attention. The dental team needs to take advantage of this developmental characteristic and spend additional time providing oral home care instructions and suggestions for improving gingival health, as well as guidance directed toward the adolescent's general health and appearance. Because of the adolescent patient's complex concerns and interests, the dental practitioner needs to be an excellent clinician in providing dental services as well as an excellent educator and communicator in providing information that is clinically relevant and psychologically sensitive to meet the teenager's needs.

Although adolescents may be prone to risky behaviors, from a cognitive perspective, the adolescent is moving from a more concrete way of thinking to more abstract thought and to a better understanding of the true consequences of their behaviors. Therefore, adolescents should be able to selfassess their oral hygiene practices to achieve and maintain excellent oral and dental health. Because the dental practitioner is able to communicate with the adolescent one-on-one without parental influence or reinforcement, the mastering of self-care practices may help the adolescent in developing a stronger self-identity.

#### Necrotizing ulcerative gingivitis

Generally, necrotizing ulcerative gingivitis (NUG) is not associated with childhood and occurs in less than 1% of North American and European children [20]. When NUG is seen in young children, it usually is associated with medically compromised individuals. Most frequently, NUG first appears during the circumpubertal years and often has a stress-related component (Fig. 1). The associated causative bacteria are *Borelia vincentii*, a spirochete, and *Prevotella intermedia* [20]. The two most significant findings of NUG are the presence of interproximal gingival necrosis and a rapid

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Fig. 1. Necrotizing ulcerative gingivitis in adolescent female. Note the presence of interproximal gingival edema, calculus, and tobacco stains.

onset of gingival pain [21]. Factors that may predispose individuals to NUG include viral infections, malnutrition, emotional stress, lack of sleep, and many systemic diseases [22]. These predisposing factors are often first present during adolescence, subjecting the adolescent to a greater susceptibility to NUG. If left untreated, NUG may spread to the underlying structures and become necrotizing ulcerative periodontitis [23].

Treatment includes debridement of local irritants with prophylaxis and scaling. Sometimes the use of an ultrasonic scaler with water spray may be effective and minimizes discomfort to the patient [20]. If the adolescent patient is a smoker or uses smokeless tobacco, the dental practitioner should encourage the patient to discontinue use of tobacco products because they irritate the tissue and delay healing [24]. Meticulous brushing with a soft bristle toothbrush along with rinsing with a 1.5% hydrogen peroxide or a 0.2% chlorhexidine gluconate solution can be recommended [24]. When the patient is febrile and exhibits other systemic symptoms, medications such as penicillin or metronidazole have been used [20]. A follow-up re-evaluation is advised.

#### Herpes simplex

Although the primary infection of the *Herpes simplex* virus (HSV) usually first appears during the preschool years, adolescents who have not been exposed to the virus may be affected with a primary infection (HSV-1) [25]. In addition, teenagers who engage in oral sex may present with HSV-2 lesions in the oral cavity and perioral areas. According to a recent survey from the National Center for Health Statistics, more than half of all teenagers in the United States aged 15 to 19 have engaged in oral sex—including nearly a quarter of those who have never had intercourse [26]. Sexually transmitted diseases (STDs) are spreading faster among young people ages 10 to 19 than among any other age group, with females being more

likely to contract HSV-2 from a single act of unprotected sex than males [27]. The dental practitioner should be aware of such infections and a question relating to the adolescent patient's sexual activity in the medical history may be advisable and justified.

Common symptoms that precede primary herpetic gingivostomatitis include fever, headaches, malaise, and cervical lymphadenopathy [28]. Within a few days, vesicles appear on the gingiva, tongue, lips, and palatal mucosa. The vesicles then rupture, leaving painful ulcers and inflamed marginal gingiva. Treatment for this condition is palliative. Antiviral medications taken systemically such as acyclovir, famciclovir, and valacyclovir, may be used in combination with acetaminophen or ibuprofen to alleviate symptoms for the adolescent patient [29]. Subsequent episodes usually appear as recurrent *Herpes labialis* (RHL), with only 5% of the recurrences developing intraorally (Fig. 2) [28]. Penciclovir cream may be used for the perioral lesions, but the medicament should not be used concurrently with any of the systemic antiviral agents.

# Pericoronitis

The permanent third molars are the last teeth to erupt into the dental arches, usually emerging between the ages of 17 and 25 years. An erupting third molar often is associated with an accompanying tissue operculum on the distal aspect of the tooth, creating a periodontal pocket. This pocket provides an anaerobic environment for the entrapment and multiplication of *Fusobacterium* and *Bacteroides* species [30]. Pericoronitis is defined as inflammation of the gingiva surrounding the crown of a partially erupted tooth and is the most common reason for impacted third molar removal in patients 20 years and older [31]. Because of a lack of information based on well-designed studies, the decision to extract asymptomatic third molars



Fig. 2. Perioral recurrent Herpes labialis in an adolescent female.

that are neither painful nor damaging other teeth remains controversial among dentists.

In a recent study conducted at two dental schools, 254 patients in their 20s who opted not to have their permanent third molars extracted were examined regularly over a period of 2 years. The data indicated that 60% of the subjects showed signs of early periodontal disease around those teeth at the onset of the study, and approximately 25% experienced a worsening of the condition during the next 2 years [32]. Apparently, once the anaerobic bacteria become established in the oral cavity, the infection spreads and may damage the supporting periodontal structures surrounding the other teeth. The study did not indicate a cause and effect relationship between the eruption of permanent third molars and the presence of periodontal disease, but an association between the two was observed. These recent findings illustrate the need for dentists to monitor the eruption patterns of third molars in their adolescent patients more carefully, thereby identifying and preventing the onset of early periodontal disease.

The condition of third molars and the prevention of associated periodontal disease are especially important for female patients during their childbearing years. This is because periodontal pocketing around third molars in pregnant patients has been linked to the likelihood of premature birth [33]. Researchers enrolled 1020 women, all less than 26 weeks pregnant, to undergo thorough periodontal examinations for categorizing the women's periodontal health as either *healthy-mild* or *moderate-severe* depending on periodontal pocket depths. While it has been accepted that periodontal disease affects mainly people older than 35 years of age, the researchers found that at least 25% of the pregnant women in their 20s exceeded the threshold for the mild form of periodontal disease [33]. Apart from the presence of periodontal pockets, particularly around the third molars, none of the women exhibited symptoms of periodontal disease such as pain, bleeding gingival tissue, or halitosis. The researchers found that having periodontal disease was a slightly better independent predictor of prematurity than smoking during pregnancy. Pregnant women with pocket depths of four or more millimeters around the third molars had twice the risk of increased systemic inflammation as measured by blood levels of C-reactive protein. This protein, in high levels, also is an indicator of heart disease. The women in this study had been designated as high-risk obstetric patients, and 18% of them had delivered prematurely. This rate is almost two times as great when compared with the general population. The increased risk could not be explained by factors such as age, diet, weight, previous preterm birth, marital status, or lack of health insurance. In addition, 13% of the study patients had moderate to severe periodontal diseases at the beginning of the study. This is a higher percentage than would normally be expected to appear in this age group. For this reason, the results may not be applicable to all pregnant women. However, based on the findings, dentists should evaluate the periodontal pockets surrounding the third molars in their female adolescent

patients, as well as all women of childbearing age, and should be aware of the subsequent systemic risks from oral inflammation associated with periodontal pathology.

# Chronic gingival conditions

# Chronic nonspecific gingivitis

A type of gingivitis seen commonly during the prepubertal and adolescent periods is chronic nonspecific gingivitis (CNG). CNG is characterized by inflammation of the marginal gingiva without detectable loss of bone or connective tissue attachment [34]. The marginal gingiva is red, edematous, and bleeds easily upon probing. CNG may be localized to the anterior or posterior regions or may present as a generalized condition. Because of its chronic nature, CNG may occur for long periods of time without improvement.

The dental practitioner should evaluate the CNG to determine its cause. Although there is agreement that gingivitis is caused by microbial plaque, CSG should be regarded as a multifactorial disease with intrinsic and extrinsic contributing factors impacting the severity of the condition.

Several factors that influence plaque or biofilm formation may be present in the adolescent dental patient, including: (1) disturbances in enamel mineralization; (2) the presence of carious lesions; (3) restorations with defective margins; (4) dental malocclusion; and (5) the presence of fixed orthodontic appliances (Fig. 3) [35]. For example, a hypoplastic permanent tooth with a roughened enamel surface may accumulate plaque easily and, over time, a pronounced gingivitis will follow if proper oral hygiene is not maintained. Untreated carious lesions, especially in the cervical areas of the teeth, are very susceptible to increased plaque accumulation and often are accompanied by a pronounced CNG. Because the adolescent's caries pattern shifts from mainly pit and fissure lesions to interproximal caries, the presence of more complex dental restorations may increase the possibility of having



Fig. 3. Accumulation of plaque resulting in chronic nonspecific gingivitis in adolescent patient undergoing comprehensive orthodontic therapy.

restorations with defective margins or inadequate contacts. The dentist who places interproximal or cervical restorations in the adolescent's teeth should be meticulous in the placement to ensure the presence of healthy surrounding gingival tissues.

Dental malocclusion, particularly crowding, may make oral hygiene practices more difficult for the adolescent dental patient to perform. If the malocclusion is left untreated, CNG will develop easily. In particular, the teenage patient wearing fixed orthodontic appliances may have difficulty in properly removing food and plaque from areas around bands, brackets, and wires. Studies have shown that oral hygiene standards deteriorate over time without supervised maintenance by the dental practitioner [36]. Thus, if adequate oral hygiene is not being maintained, the dentist should recommend more frequent dental prophylaxes than every 6 months to patients undergoing orthodontic treatment. In addition, adolescent orthodontic patients should consider using powered toothbrushes and oral irrigation for plaque removal as part of routine oral home care [19].

Additional factors affecting the adolescent dental patient's defense system may contribute to the development of CNG. These factors include: (1) mouth breathing; (2) increased hormonal activity (as described previously in this chapter); and (3) systemic diseases [35].

Mouth breathing often causes drying of the gingival mucosa that may contribute to the development of CNG. This condition is characterized by glossy red alveolar mucosa and gingival, enlarged interdental papillae, thick gingival margins, and a bleeding tendency upon probing [37]. The tissues become desiccated resulting in vasoconstriction and decreased host resistance [35]. Determining the underlying cause of the mouth breathing in the adolescent dental patient may require a multidisciplinary approach involving both an orthodontist and otolaryngologist. Possible causes of the condition may include dental and skeletal malocclusions as well as airway obstruction. The immediate problem may be managed by lubricating the tissues with petrolatum, glycerin, or a salivary substitute especially at bedtime. Because halitosis may accompany this condition, the adolescent dental patient may have increased concern about its treatment. The dentist should reinforce the need for meticulous oral hygiene to these patients, because plaque and bacteria may be more difficult to remove from desiccated tissues.

# Chronic gingivitis associated with systemic diseases

Some systemic diseases seen in the adolescent dental patient, especially disease affecting the host response, may exacerbate gingival health and result in chronic gingivitis [34]. Some of these conditions include: (1) acute lymphoblastic leukemia (ALL); (2) insulin-dependent diabetes mellitus (IDDM); and (3) human immunodeficiency virus (HIV)-positive infections.

ALL, the most commonly occurring adolescent leukemia, has oral manifestations that may be observed by the dental practitioner. This section will describe only the gingival abnormalities of ALL. These oral conditions occur generally at the time of hospitalization and during chemotherapy, may be variable, and are not pathognomonic for the disease [34]. The gingival tissues of an adolescent leukemic patient are enlarged, bluish-red in color, and bleed easily [38]. In a study of 77 pediatric patients with acute leukemias, gingival enlargements, bleeding, and various stages of gingivitis were observed [38]. After oral hygiene measures were applied, most areas of gingival enlargement were resolved and the gingival bleeding stopped [38]. Oral home care instructions should be stressed to the adolescent dental patient with leukemia because the gingival tissues are affected not only by the leukemic state but also by the hormonal influences of puberty. Because leukemia appears to exacerbate rather than initiate marginal periodontal disease, an optimal approach to prevent leukemic gingival conditions from occurring is to maintain meticulous oral hygiene [38].

Adolescents with poorly controlled IDDM may present with significantly more gingival inflammation than healthy patients with similar plaque scores, indicating an increased susceptibility to periodontal disease [39]. Many of these patients exhibit: (1) an exaggerated response to inflammation; (2) changes in color and contour of the gingival tissues; (3) increased gingival exudates; (4) bleeding upon probing; and (5) no loss of attachment or bone [40]. These conditions are reversible with control of the diabetic state, and excellent oral self care practices limit their severity.

HIV infections continue to affect an increasing number of women, children, and adolescents worldwide. Infection with HIV results in profound immunosuppression, rendering the host susceptible to the development of various opportunistic infections. Frequently, oral manifestations are among the first symptoms in HIV-infected children [41]. Linear gingival erythema occurs frequently in HIV-infected adults and has been reported in children with perinatally acquired HIV infection [42]. In children, linear gingival erythema appears as an intensely erythematous band involving the labial marginal and attached gingivae [43]. In one study, a prevalence of 37% of the 67 sample children demonstrated this particular gingivitis as well as a greater accumulation of plaque [44]. The dentist should be aware of linear gingival erythema and its association with HIV infections in the adolescent dental patient.

# **Gingival recession**

Localized gingival recession appears in approximately 10% to 15% of adolescent dental patients [35]. While the recession occurs frequently on the facial surfaces of the mandibular incisors in young children, in teenagers the recession is found more often on the buccal surfaces of the maxillary and mandibular canines, premolars, and molars [45]. In adolescent dental patients, gingival recession is found in association with: (1) malpositioned teeth; (2) orthodontic treatment; (3) excessive toothbrushing; (4) plaque accumulation; and (5) effects of certain body art practices. Before treatment of the gingival recession, the dentist must determine its cause (Fig. 4).

Malpositions of teeth, especially labial displacement and rotations, predispose the adolescent dental patient to localized gingival recession [35]. For example, a crossbite relationship involving anterior teeth may be subjected to stresses that cause mobility and migration of the teeth as well as gingival recession. Adolescents with malpositioned teeth may need referral for orthodontic evaluation and treatment as an adjunct to resolve the gingival recession.

Teenagers undergoing orthodontic treatment may demonstrate gingival recession secondary to excessive labial forces placed on the mandibular anterior teeth. If the orthodontic forces are not within physiologic limits, bone loss may occur with the subsequent formation of a dehiscence. The gingival tissues overlying this bony defect react to the trauma by receding. Usually, correction of the dehiscence requires a periodontal surgical graft.

Intraoral and perioral piercings are forms of body art that appeal often to impressionable adolescent dental patients. Even though the legal age for obtaining body art in the United States is 18 years, adolescents may perform self-piercings and piercings on each other during parties, before rock concerts, at sporting events, and other places where teenagers gather. Regardless of where the piercings are being performed, currently no national piercing standards exist [46].

Piercings place the adolescent dental patient at risk for serious medical and dental consequences. One out of every five piercings results in infections from contaminated puncture wounds [47]. As intraoral and perioral piercings continue to increase in popularity, potential damage to the hard and soft tissues in the surrounding areas is more likely to be diagnosed and evaluated by the dental practitioner. In a survey of 438 pediatric dentists, 24% reported that they had treated patients with complications subsequent to



Fig. 4. Gingival recession in adolescent dental patient related to poor oral hygiene from plaque accumulation.

intraoral piercings [48]. The following section limits its discussion to the effects of piercings on gingival tissues.

Intraoral and perioral piercings may cause injury to the gingival tissues, such as inflammation and recession [49–51]. Constant pressure being applied to a specific area repeatedly may result in severe localized attachment loss [50]. In one study of 52 young adults (mean age, 22 years), tongue piercing was a significant factor in the development of lingual recession in the mandibular anterior teeth [52]. In addition, increased time of wear of the tongue jewelry was associated with increased prevalence of gingival recession [52]. In another study of 43 patients ranging from 14 to 34 years of age (mean age, 21 years), periodontal and dental trauma resulting from tongue and lip piercings was assessed. Postpiercing complications were reported in 34.9% of the subjects. Most of the patients who had lip piercings (80%) had one or more labial sites with gingival recession, and almost one third of those who had a tongue piercing had at least one lingual site with gingival recession. Dentists must assess thoroughly the soft tissue areas adjacent to tongue jewelry for possible injury to the gingival tissues. Because outcomes associated with periodontal surgery on the lingual surfaces of teeth are not as successful as surgery on the buccal and facial surfaces, prevention is the optimal option [52]. Effective educational strategies and cessation programs are needed to target adolescent dental patients who choose to have tongue or lip piercings. They should be informed that such piercings could be hazardous to their oral health as well as their overall appearance.

# Medication-induced gingival enlargements

Certain types of medications such as phenytoins, calcium-channel blockers, cyclosporines, and, recently, amphetamines have been shown to cause gingival overgrowth or enlargements. The newer terminology may be more accurate descriptions than the former term, gingival hyperplasia, because most studies have not demonstrated an increase in the number and density of fibroblasts [57,58]. These medication-induced gingival enlargements begin at the interdental papilla and progress to the marginal gingiva, at times covering the entire tooth [53]. Amphetamines, cyclosporines, and phenytoins are discussed in the following sections, because these types of drugs are prescribed more commonly for adolescents compared with antihypertensive medications such as calcium-channel blockers that are generally used by an older population.

#### Amphetamines

Amphetamines are a class of drugs that were used previously as antiobesity medications but now are used to treat certain subtypes of attention deficit disorders (ADD). These conditions affect 5% to 10% of school-aged children and accounts for half of the childhood referrals to diagnostic clinics. ADD with hyperactivity and impulsivity is seen 10 times more frequently in boys than girls and not only is manifested in childhood but also persists throughout adolescence and sometimes into adulthood [54]. Amphetamines are prescribed for adolescent patients diagnosed with ADD with hyperactivity [55]. The primary medications for this subtype of ADD are methylphenidate and dextroamphetamine derivatives. In children and adolescents, they are used to reduce hyperactivity, short attention span, and emotional problems.

Some of the more common side effects associated with amphetamine use include: (1) increased nervousness; (2) anorexia; (3) upper abdominal pain; and (4) difficulty in sleeping [55]. With respect to adverse dental effects, a recent study involving 40 subjects aged 6 to 14 years examined the relationship between amphemtamine ingestion and gingival enlargement. All participants were taking dextroamphetamine derivatives for ADD with hyperactivity but not taking any other medication known to cause gingival enlargement. Evaluation of the patients' gingival health included plaque and gingival indices as well as intraoral photographs. The medication was taken over a period of 5 to 27 months, with dosages ranging from 5 to 30 mg/d. The prevalence of gingival enlargement in patients taking amphetamines was 80%, and was 50% in patients taking no medications. The study concluded that gingival enlargement was associated with the gingival indices, but not the plaque indices, in patients taking amphetamines (P = .0022) [56].

# Cyclosporines

Cyclosporines are immunosuppressive agents used to prevent graft rejection after organ transplantation and to treat various autoimmune disorders. Cyclosporine A, in particular, is formulated for oral, intramuscular, and intravenous administration. Gingival overgrowth, one of the most notable adverse dental effects, has been reported after cyclosporine A therapy (Fig. 5) [57]. The reported incidence of cyclosporine A-induced gingival overgrowth varies, but in a few well-controlled studies, the overall incidence is reported to be between 25% and 30% [58]. Gingival overgrowth is limited to the width of the attached gingiva but may extend coronally interfering with occlusion and mastication [57].

Additional factors predisposing the patient to gingival overgrowth are age and sex of the patient. Studies suggest that children, especially adolescents and young females appear to be more susceptible to cyclosporine A-induced gingival enlargement than adults [58]. These occurrences may be related to a unique fibroblastic phenotype in younger patients or to the influence of sex hormones [57]. Severe gingival overgrowth in the form of pseudopockets (probing depth >4 mm) has been reported in approximately 20% of children [34].



Fig. 5. Cyclosporine A-induced gingival overgrowth in the mandibular anterior region of a 14-year-old boy.

# Phenytoins

Another well-documented drug associated with the side effect of gingival overgrowth is phenytoin [60]. Diphenylhydantoin, an anticonvulsant medication, is prescribed for treatment of grand mal and psychomotor seizures in children. The incidence of phenytoin-induced gingival overgrowth in patients undergoing long-term phenytoin therapy is between 40% and 50% [60,61]. The gingival overgrowth may appear as early as 2 to 3 weeks after initiating therapy and peaks at 18 to 24 months (Fig. 6). As with cyclosporine A, the overgrowth begins at the interdental papilla, with the overgrowth being more pronounced in the buccal and anterior segments of the dental arches.

The gingival enlargement may cause difficulties with: (1) esthetics; (2) mastication; (3) tooth eruption; (4) speech; and (5) the development of subsequent periodontal disease. Research has not substantiated a correlation



Fig. 6. Phenytoin gingival overgrowth in young adolescent dental patient with a seizure disorder.

between gingival overgrowth and the serum level of phenytoin per unit body weight. Referral to the periodontist for surgical removal of the tissue may be required.

# **Preventive strategies**

Because medication-induced gingival enlargements may hasten the progression of periodontal disease in the adolescent dental patient, preventive strategies must be initiated by the dental practitioner. Most studies imply that effective plaque control and removal of local irritants can decrease the severity of drug-induced gingival overgrowth so preventive measures should be directed to controlling the inflammatory component [53–61].

Oral hygiene therapies for adolescent patients taking amphetamines, cyclosporines, and phenytoins should include: (1) 3- to 4-month recall examination with dental prophylaxis; (2) reinforcement of oral hygiene instructions; (3) use of antibacterial mouth rinses; and (4) surgical involvement in severe cases [56]. Even though the adolescent dental patient possesses the manual dexterity and the intellectual capacity to effectively maintain meticulous oral hygiene, parental involvement is important. The parents' responsibilities may include supervision, assistance, and reminding. Consultation with the patient's physician regarding length of the drug therapy, the patient's overall physical status, and any other questions relevant to the dental treatment is recommended. If possible, before the patient initiating drug therapy, an oral hygiene regimen should be established to prevent or to minimize the occurrence of medication-induced gingival enlargements.

### Summary

The teenage years between puberty and maturity represent a period of physical and psychologic growth and development known as adolescence. This period is accompanied by accelerated body growth, hormonal fluctuations and puberty, as well as mood swings and behavioral changes. All of these factors have an impact on the oral health of the individual adolescent, including the hard and soft structures of the periodontal tissues. This article addresses the causes, identification, prevention, and treatment for acute gingival conditions such as gingivitis, necrotizing ulcerative gingivitis, and pericoronitis, more long-standing conditions such as chronic nonspecific gingivitis, chronic gingivitis associated with systemic diseases, as well as localized gingival recession. Medication-induced gingival enlargements are described also. Thus, the intent of this chapter is to provide practicing dental professionals with evidence-based, clinically relevant information on periodontal and soft tissue prevention strategies to improve the delivery of care and general health and well-being of their patients who are progressing through adolescence toward full maturity and adulthood.

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