1

Early Childhood Oral Health

Homa Amini

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Case 1

Perinatal Oral Pathology

Figure 1.1.1 Intraoral photograph showing anterior mandibular natal teeth.

A. Presenting Patient

- Seven-day-old male
- Consultative visit requested by neonatologist

B. Chief Complaint

- Neonatologist requests "evaluation of what appear to be teeth erupting on bottom jaw"

FUNDAMENTAL POINT 1

Obtaining a History

- Obtain a thorough history of the pregnancy and birth
- Obtain a thorough understanding of the child's natal teeth, including when first observed, associated complications with ventilator tubing, or infections (Cunha et al. 2001; Amini and Casamassimo 2010)

C. Social History

- First child
- Twenty-one-year-old single, immigrant mother
- Qualified for public assistance

D. Medical History

- Born two weeks prematurely
- On ventilator for two days
- Currently in pediatric intensive care unit

E. Medical Consult

- Not applicable

F. Dental History

- Teeth present at birth

G. Extraoral Exam

- Head misshapen
- Sparse hair

FUNDAMENTAL POINT 2

Clinical Exam: Significance of Findings

- Determine if the teeth present a problem for nursing due to irritation of child or mother. Also determine the potential risk of aspiration if teeth are mobile
- If removal is contemplated, consider radiographic examination to determine whether teeth are supernumerary or prematurely erupting teeth of the primary dentition

H. Intraoral Exam

- Edentulous maxillary arch
- High maxillary frenum
- Palate intact
- Mandibular arch with teeth in the mandibular left central incisor and mandibular right central incisor positions, partially erupted, brownish in color, rotated and firm to manipulation (Figure 1.1.1)

BACKGROUND INFORMATION 1

Natal and Neonatal Teeth

- Teeth can be present at birth (natal teeth) or erupt within the first 30 days after birth (neonatal teeth)
- Most natal teeth are members of the normal complement of primary teeth
- Most natal teeth appear in the mandibular anterior region
- Natal teeth may be associated with other disorders, usually those involving the skin, bones, or ectoderm, such as chondroectodermal dysplasia. Therefore, careful systemic evaluation of children with natal teeth is necessary (Moura et al. 2014)

I. Diagnostic Tools

- Occlusal radiograph of mandibular anterior region if deemed necessary (Figure 1.1.2)

J. Differential Diagnosis

- Other congenital neonatal pathology including: Bohn's nodules, Epstein's pearls, and other retention phenomena

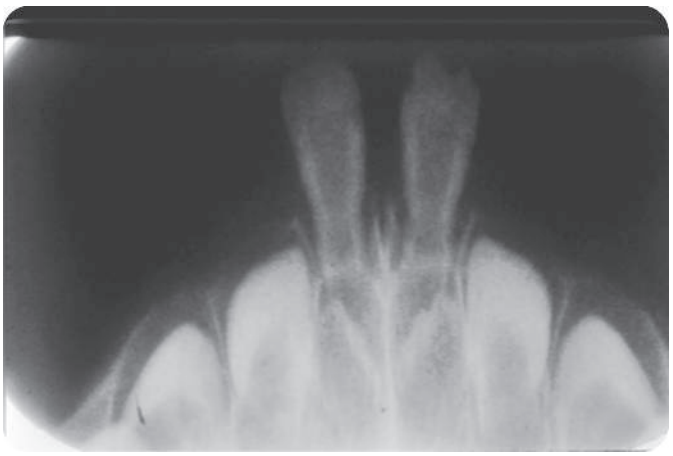

Figure 1.1.2 Mandibular occlusal radiograph showing natal teeth.

K. Diagnosis and Problem List

Diagnosis

- Natal teeth

Problem List

- Potential for nursing difficulty
- Potential for aspiration
- Potential for traumatic ulcer of the ventral surface of the tongue known as Riga–Fede disease (Figure 1.1.3)
- Potential for trauma to the mucosa of the opposing arch

L. Treatment Plan

- Observe for mobility, ulcerations, and nursing difficulty
- Extraction as indicated

M. Prognosis and Discussion

- No literature describes the risk of aspiration of natal teeth, so removal should be based primarily on the appearance, firmness, and likelihood of function of the tooth
- In the event the tooth is a member of the normal complement of primary teeth, parents should be made aware that the loss might result in alteration of spacing and alignment of the remaining primary teeth

N. Complications and Alternative Treatment Plan

- If the infant presents with a ventral tongue ulceration or the mother presents with an ulceration on the breast, incisal edge recontouring can be considered
- The child's vitamin K status should be determined prior to extraction within the first 10 days of life. Intramuscular administration of vitamin K at birth can reduce the risk of bleeding

Figure 1.1.3 Traumatic ulcer (arrow) on the ventral surface of the tongue.

Self-Study Questions

1. What is the probability that natal teeth are members of the normal complement of primary teeth?

2. Where do natal teeth most often occur in the mouth?

3. What is a potential risk of using topical anesthetics in infants prior to extraction of a natal tooth?

4. What are potential etiologies of natal teeth?

5. What are characteristics of other neonatal oral lesions that would help differentiate a natal tooth?

Answers are located at the end of the case

Self-Study Answers

1. The overwhelming probability is that a natal or neonatal tooth is a member of the 10 primary teeth in the arch, with fewer than 10% in most surveys being supernumeraries

2. Most natal teeth occur in the mandibular arch in the incisor region, and more than half the time they occur in pairs

3. Methemoglobinemia is a rare risk if topical anesthetics like benzocaine or prilocaine are used in infants. Oral sucrose can be considered prior to the extraction of a mobile natal tooth to soothe the neonate

4. Etiologies are usually attributed to a superficial position of the primary tooth bud, but also may include genetic factors, endocrine disorders, infection, and conditions such as cleft lip and palate, and Hallermann–Streiff syndrome

5. The other congenital oral abnormalities, which might be mistaken for a natal tooth, include a keratin-filled body such as a Bohn's nodule or a mucous retention cyst. However, they are softer in consistency

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Case 2

First Dental Visit, Healthy Child

Figure 1.2.1 (A) Knee-to-knee exam; (B) extraoral exam; (C) intraoral exam.

A. Presenting Patient

- Twelve-month-old African-American female

B. Chief Complaint

- Mother reports, "My pediatrician said I needed to bring her in for her first dental check-up"

C. Social History

- Lives with parents and two older siblings
- Mother is primary caregiver

D. Medical History

- Review of systems: normal
- History of well-child visits and immunizations up to date in medical home

E. Medical Consult

- Not applicable

F. Dental History

- First dental visit
- No toothbrushing performed at this time
- Fluoridated water supply is main source of drinking water
- Uses pacifier intermittently
- Still drinks from bottle for meals and snacks, but not freely

G. Extraoral Exam

- Head, neck, and facial features normal
- Height and weight at 60th percentile
- Child marginally cooperative for knee-to-knee examination (Figure 1.2.1a,b)

H. Intraoral Exam (Figure 1.2.1c)

- Soft tissues healthy
- Eight teeth present, developmentally within normal range for age but with crowding
- Plaque on teeth

FUNDAMENTAL POINT 1

Dental History in Infant Oral Health

- The first dental visit should occur by the first birthday (American Academy of Pediatric Dentistry [AAPD] 2018–19)
- Brushing should begin as soon as a child is dentate, with just a smear of fluoridated dentifrice (American Dental Association Council on Scientific Affairs 2014)
- Consider other forms of preventive therapy such as improving the oral hygiene of the mother and encouraging a healthy diet and regular dental visits
- Oral habits do not usually pose a problem at this age (see Chapter 7, Case 4 for more on oral habits)
- The mother should begin weaning a child from breastfeeding at one to two years and start transitioning the child to a sippy cup or regular cup (Dietz and Stern 1999; American Academy of Pediatrics 2014)
- The age one visit is an excellent opportunity to evaluate the risk of other noncarious conditions such as altered teething, oral habits, eruption, trauma, occlusion, nutrition and obesity, soft and hard tissue pathology, immunizations, airway, gastroesophageal reflux disease, and child abuse (Casamassimo and Nowak 2009)

BACKGROUND INFORMATION 1

Caries Risk Assessment

- This child presents with a few caries risk factors, according to the Caries Risk Assessment Tool of the AAPD, including lack of oral hygiene resulting in plaque accumulation and use of the bottle between meals See Caries Risk Assessment Tool at: http://www.aapd.org/media/Policies_Guidelines/BP_CariesRiskAssessment.pdf
- She would be considered a moderate-to-high caries risk and preventive efforts in anticipatory guidance would be directed at beginning twice-daily oral hygiene with a smear of fluoride dentifrice and transitioning off the bottle (AAPD 2018–2019)
- Parental education should include an assessment of parental oral health. The association between maternal oral health and infant oral health should be discussed. The parent should also be advised of transmissibility of cariogenic bacteria and methods to reduce it. Avoid sharing eating utensils as a potential way of reducing transmissibility (Berkowitz 2003)

I. Diagnostic Tools

- Caries Risk Assessment Tool (see Background Information 1)

J. Differential Diagnosis

- Not applicable

K. Diagnosis and Problem List

Diagnosis

- Well child, at moderate risk for dental caries

Problem List

- Lack of oral hygiene
- Still using bottle

L. Comprehensive Treatment Plan

- Dental prophylaxis and application of topical fluoride varnish
- Use knee-to-knee positioning due to inability to cooperate
- Preventive anticipatory guidance on oral hygiene. Fluoride exposure through tap water and fluoridated dentifrice, nutrition including bottle weaning, injury prevention, and non-nutritive oral habits
- See child again in six months for professional preventive care and to assess compliance and effectiveness of home care

M. Prognosis and Discussion

- Oral hygiene success will depend upon the parents' ability to provide twice daily brushing for this child. Her age suggests that positioning will be important for oral hygiene delivery

- Bottle weaning takes some planning and effort. In this child's favor is the fact that she is not using the bottle at night and that her pediatrician will likely support this transition
- Pediatrician and parents should be complimented for establishing a dental home at the appropriate age. This should allow for prevention of caries and other disorders through anticipatory guidance and early intervention

N. Common Complications and Alternative Treatment Plans

- A complicating factor, which would require a change in plan, would be if the child did not have access to a fluoridated water supply

Self-Study Questions

1. What areas should be covered in anticipatory guidance related to oral hygiene?

2. What is the dietary pattern that is considered normal for a child from six months to 12 months?

3. When do habits become a concern in the pre-school child?

4. What factors are considered when determining the recall interval in infant oral health?

5. How would preventive recommendations change if the child did not have access to a fluoridated municipal water supply?

Answers are located at the end of the case

Self-Study Answers

1. A thorough coverage of oral hygiene includes frequency and duration, a technique demonstration with the child, review of devices, dentifrice use, location at home, positioning ideas, and problem solving such as how to fit oral hygiene into the family's daily routine

2. A child may be breast or bottle fed for the first six months of age. In the next six months, breastfeeding may be stopped or continued, depending on the needs and wishes of the mother and child. Some solid food is introduced in this period as well and bottle feeding ends with a transition to a cup at meal times. At 12 months, the child should be self-feeding and drinking from a cup on a trial basis since the process is initially messy

3. Habits are emotionally satisfying in the first few years of life and become detrimental when they cause dental changes, which can occur at any time. Allowing a habit to continue is a balance between its benefit to the child and any effect it may have on oral health. Most habits are lost by the third year of life. However, parents should be counseled on the potential effects of habits and be encouraged to wean the child from pacifiers or fingers as soon as it is feasible

4. Caries risk factors not only determine what anticipatory guidance information is to be provided to parents, but also how frequently a child is seen again. The reliance of a child on parental care makes it important to assess outcomes in areas such as oral hygiene, diet, and anticipated parental compliance. No fixed interval is right for every child. However, in general the higher the caries risk the more frequent the recall. Also, the dentist should recommend a reasonable recall period to allow parents the time to effect improvement

5. Supplemental fluoride in the form of prescribed drops, tablets, or rinses should be considered as a preventive recommendation for the child who lives in an area where the municipal water supply has no (or minimal) fluoride concentration. The amount of fluoride that is prescribed is based on the child's age (months to years) and the known amount of fluoride concentration (ppm) in the child's main water supply

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Case 3

First Dental Visit, Medically Compromised Child

Figure 1.3.1 Knee-to-knee exam position.

A. Presenting Patient

- Sixteen-month-old Caucasian female

B. Chief Complaint

- Mother states, "My pediatrician said I should take my baby to a dentist to look at her teeth"

C. Social History

- First child
- Stay-at-home mother
- Medicaid coverage for medical and dental care

D. Medical History

- Allergies to nuts
- Gastroesophageal reflux disease (GERD)
- Medications: Pepcid AC® (McNeil Consumer Pharmaceuticals Co., Fort Washington, PA, USA)

E. Medical Consult

- Consult with primary care medical provider

FUNDAMENTAL POINT 1

Medical History

- Contact physician about nature of allergy: when it was first observed, intensity, therapy, is it well controlled?
- Note possible crossreactivity of various substances in patients with nut allergy, including some kinds of fluoride varnish
- Be aware of heightened risk of allergic responses to other materials used in dentistry, such as latex
- Determine the cause and extent of GERD and efficacy of Pepcid therapy

F. Dental History

- Child has never been to a dentist
- Mother receives regular dental care
- Unfluoridated water system (private well)
- Oral hygiene is not performed
- Child is still bottle-fed
- Child sucks thumb or pacifier when desired

FUNDAMENTAL POINT 2

Dental History in Infant Oral Health

- In the dental history assessment, cover the major areas of anticipatory guidance: stage of development, oral hygiene, fluorides, diet, habits, teething, and injury prevention (Nowak and Casamassimo 1995; American Academy of Pediatric Dentistry [AAPD] 2018–2019)

G. Extraoral Exam

- Normal weight and height for age
- Head and neck exam within normal limits

H. Intraoral Exam

- Use knee-to-knee exam position to examine infant (Figure 1.3.1)
- Intraoral soft tissues normal with minor gingivitis
- Primary teeth present and with normal eruption for age
- Plaque on teeth with areas of cervical decalcification (Figure 1.3.2)
- Incisal edges rounded (Figure 1.3.2)
- No cavitation noted

FUNDAMENTAL POINT 3

Intraoral Exam in Infant Oral Health

- The knee-to-knee exam position is ideal for infants. It allows for good patient stabilization and excellent visualization by both the provider and the parent
- Plaque on teeth at this age and the surrogate measure of gingivitis are strong predictors of future dental caries (Alaluusua and Malmivirta 1994)
- Loss of anatomical definition is one indicator of dental erosion and at this age should be a warning sign (Barron et al. 2003)
- Oral erythema and gingivitis also may accompany GERD (Barron et al. 2003)
- Instruct parent on methods of oral hygiene with attention to frequency and use of a "smear" of fluoridated dentifrice
- Include recommendation for next recall visit to determine compliance and outcomes of preventive anticipatory guidance and progress of erosion

Figure 1.3.2 Intraoral photograph showing cervical decalcification.

I. Diagnostic Tools

- Caries Risk Assessment Tool
- Fluoride assessment of drinking water

FUNDAMENTAL POINT 4

Assessment Tools in Infant Oral Health

- Caries risk: use the AAPD Caries Risk Assessment Tool in assigning a patient's risk category: http://www.aapd.org/media/Policies_Guidelines/BP_CariesRiskAssessment.pdf
- Fluoride assessment and prescribing: use the AAPD Guideline on Fluoride Therapy to determine amount and vehicle: http://www.aapd.org/media/Policies_Guidelines/BP_FluorideTherapy.pdf

J. Differential Diagnosis

- Not applicable

K. Diagnosis and Problem List

Diagnosis

- Normally developing child, with age appropriate oral development
- GERD
- High risk for dental caries

Problem List

- Still feeding from bottle, including at bedtime
- Indeterminate fluoride status
- No oral hygiene being practiced
- Dental erosion from GERD

L. Comprehensive Treatment Plan

- Provide parents with alternatives to bottle use and ways to eliminate sleeping with the bottle at night
- Perform an assessment of the fluoride content of the family's main source of drinking water and prescribe supplementation as needed

BACKGROUND INFORMATION 1

Food Allergies and GERD

Food Allergies

- Food allergies occur in the first two years of life and are IgE-mediated
- Cow's milk, hen's eggs, soy, peanuts, tree nuts, wheat, fish, and shellfish account for 90% of food allergies
- Management is based on identification of the antigen and then avoidance of the food
- Children often outgrow milk, soy, egg, and wheat allergies, but have lifelong problems with nuts and shellfish (Allen et al. 2006)

GERD

- GERD causes dental erosion in most afflicted dental patients to some degree
- Drug treatments include acid-neutralizers (example: milk of magnesia), histamine-2 blockers (example: ranitidine), prokinetic agents (example: cisapride), and proton pump inhibitors (example: omeprazole)
- Surgical treatment may involve fundoplication (Nissen procedure)
- Soft tissue involvement can include chronic laryngitis, laryngeal ulcers, chronic sore throat (Barron et al. 2003)

M. Prognosis and Discussion

- Cessation of bottle feeding will hinge on providing the family with workable alternatives and strategies that fit into their lifestyle. Culture, family dietary habits, and stresses of daily life all need to be considered in recommendations because these are often listed as reasons why parents keep children on the bottle
- Fluoride assessment can be done through use of kits or by involving the local health department if it provides that service. The measure obtained must be from the main source of drinking water, but the clinician must also assess dietary habits and lifestyle issues, such as daycare, that may affect supplementation level. For example, a low-caries-risk child with other daily sources of optimally fluoridated water may not need supplementation
- Oral hygiene instruction requires consideration of location, timing, parents' manual skills, use of dentifrice, devices, and positioning. Each of these affect outcomes
- The decalcification and erosive effects on teeth must be monitored closely and treated before they progress to cavitation
- Establish a more frequent recall schedule for the next recall visit to assess success and provide the next phase of anticipatory guidance

N. Common Complications and Alternative Treatment Plans

- Allergy to nuts may also include reaction to some fluoride varnish formulations. Care should be taken to check the manufacturer's instructions before application
- Should a fluoride supplement be prescribed, proper dosing and storage should be discussed with the parent to prevent overuse or poisoning
- A careful distinction should be made between erosion and cavitation from caries. These two separate entities are sometimes confused, especially on posterior teeth

Self-Study Questions

1. What are four risk factors believed to be indicative of an elevated susceptibility to dental caries?

2. What are the clinical risk factors believed to be indicative of an elevated susceptibility to dental caries?

3. What are some alternatives to a night-time bottle that can be offered to parents trying to break the bedtime habit of their child?

4. What are considerations regarding the intake of fruit juice during infancy?

5. What are elements of a systematic approach to GERD in a child this age?

Answers are located at the end of the case

Self-Study Answers

1. Many risk factors have been identified including: the mother/primary caregiver has active caries, low socioeconomic status, recent immigrant status, more than three between-meal, high carbohydrate snacks or beverages per day, or special health care needs

2. The clinical risk factors which can be assessed on examination are: child has white spot lesions or enamel defects, visible cavitation, existing restorations, or significant plaque accumulation

3. To eliminate a bottle habit, parents can substitute water or gradually dilute the contents of the bottle over several nights with water. They can clean the teeth well and take the bottle away when the child falls asleep. A pacifier or other object can be substituted for the bottle. The parent can read or rock the child to sleep

4. Human milk or infant formula is recommended as the only nutrient fed to infants until approximately six months of age, and it is optimal to completely avoid the use of juice in infants before one year of age

5. The immediate and long-term treatment plans hinge on successful medical management of GERD. Close interaction with the child's physician is necessary. After a comprehensive assessment, diet modification, medication, and/or surgery may be indicated. Depending on the stage of deterioration of the dentition, local noninvasive measures should be considered first, followed by definitive restorative care if needed. Fluorides figure prominently in this intervention to remineralize enamel

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Case 4

Early Childhood Caries Managed with Silver Diamine Fluoride

Figure 1.4.1 Intraoral photograph showing early childhood caries.

A. Presenting Patient

- Five-year-, ten-month-old Caucasian female
- New patient, first dental visit

B. Chief Complaint and History of Present Illness

- Mother states her daughter's "front teeth are chipping"
- Mother reports no symptoms

C. Social History

- Mother is a single parent and the primary caregiver
- Mother does not have access to a vehicle and utilizes public transportation
- Child has insurance coverage through Medicaid

D. Medical History

- Premature birth (35 weeks of gestation)
- No known allergies
- History of bronchiolitis caused by respiratory syncytial virus (RSV) four months ago
- Hospitalized for three days after RSV infection with some persistent recurrent wheezing

E. Medical Consult

- Contact pediatrician to determine respiratory health

F. Dental History

- First dental visit
- Drinks sports drinks throughout the day
- Child brushes own teeth without toothpaste
- Uncooperative behavior for examination in knee-to-knee position

G. Extraoral Exam

- Height and weight at the 30th percentile for age
- No pathology noted on extraoral examination

H. Intraoral Exam

- Soft tissue within normal limits
- Full primary dentition
- Cavitation noted on maxillary central incisors; no other cavitation noted (Figure 1.4.1)

I. Diagnostic Tools

- Maxillary occlusal radiograph

J. Differential Diagnosis

- Not applicable

K. Diagnosis and Problem List

Diagnosis

- Early childhood caries
- High caries risk

Problem List

- Access to sweetened beverages
- Poor home oral hygiene practices
- Uncooperative for routine operative dental care
- Recurrent wheezing secondary to recent RSV infection

BACKGROUND INFORMATION 1

Chronic Disease Management

- Chronic disease management involves temporary management of cavitated lesions (for example, interim therapeutic restorations or nonoperative arresting therapy such as with SDF) with parent engagement to facilitate home preventive measures
- Use of anticariogenic strategies, such as diet counseling, at-home twice daily brushing with a fluoridated dentifrice, and frequent professional application of fluoride varnish can help prevent lesion progression
- The extent of the disease process and the patient's developmental level affect the clinician's management recommendations
- Interim therapeutic restorations and caries arrest therapy can postpone definitive restorative care but not eliminate the need for future conventional dental care

(American Academy of Pediatric Dentistry, 2018–2019a)

L. Comprehensive Treatment Plan

- Encourage child to drink water and restrict child's access to sports drinks
- Oral hygiene instruction with parent brushing child's teeth with fluoridated dentifrice
- Recent RSV infection with recurrent wheezing increases risk of sedation and general anesthesia
- Nonoperative management of cavitated lesions as part of a disease management strategy can control the disease process until definitive care can be safely delivered
- After informed consent, silver diamine fluoride (SDF) was applied to the affected incisors. Follow-up visit after two weeks to reapply SDF and reinforce the oral hygiene and diet modification components of the plan, after which a three-month recall to evaluate the lesion and assess exfoliation.

FUNDAMENTAL POINT 1

Use of SDF

- SDF will stain many surfaces it comes into contact with such as skin and hard surfaces like flooring and countertops. Carefully place one drop of SDF in a plastic dappen dish prior to application
- Remove gross debris from cavitated site to allow SDF to contact exposed dentin
- Isolate area to prevent SDF contact with soft tissue
- Gently dry surface with compressed air or cotton
- Apply SDF to lesion with microbrush
- Use cotton to remove excess SDF fluid from site if applicable
- Continue to isolate area after application for up to three minutes if possible
- Carefully dispose of gloves, microbrush, and dappen dish

(American Academy of Pediatric Dentistry, 2018–2019b,c)

Figure 1.4.2 Intraoral photograph three months after SDF placement.

M. Postoperative images

- Note darker stain after SDF application in Figure 1.4.2; cavitated and decalcified tooth structure will continue to darken over time

N. Prognosis and Discussion

- Prognosis of a disease management approach to early childhood caries is largely dependent on a family's adherence to recommendations for home care. Motivational interviewing can help parents make behavioral changes to benefit their child's oral health
- The darker color of the SDF-treated teeth is an encouraging sign for successful arrest of the lesions but is not a guarantee of arrest

- SDF does not restore form, or function of the tooth; cavitated lesions treated with SDF are usually more difficult to keep clean; and the dark color can be a source of dissatisfaction. For these reasons, traditional restoration is typically recommended as circumstances permit
- RSV is a common virus but young children are at a higher risk of a more severe course of disease with potential subsequent wheezing and asthma. Children with a history of RSV should be cleared by a physician prior to undergoing sedation or general anesthesia

O. Common Complications and Alternative Treatment Plans

- Parents may express concern with the esthetics of the dark color of SDF-treated lesions. Interim therapeutic restorations with glass ionomer cement may be a treatment option if traditional restorative care is not appropriate
- Despite SDF application, lesions can progress, leading to pulpal necrosis and dental abscess

Self-Study Questions

1. What are the contraindications to application of SDF?

2. What steps should be taken to minimize the risk of toxicity when using SDF with a very young child?

3. What is the mechanism of action of SDF?

4. Describe the components of motivational interviewing

5. What particular clinical situations are most appropriate for a nonoperative disease management approach as opposed to definitive care?

Answers are located at the end of the case

Self-Study Answers

1. Symptomatic teeth, necrotic teeth, history of allergy to silver, and a relative contraindication of desquamative gingivitis or mucositis

2. Limit to one drop of 38% SDF per 10 kg of child body weight and limit application to a maximum of five teeth at one session, although no toxicity or systemic adverse events have been reported with 38% SDF

3. The high concentration of fluoride promotes remineralization and inhibits demineralization, while silver ions are bactericidal and inhibit biofilm formation

4. Motivational interviewing aims to provide an empathic, supportive, yet directive counseling style to enhance motivation for positive behavioral change, based on partnership, acceptance, compassion, and evocation. There are four steps in the process including engaging with the parent, focusing on a change goal, evoking motivation for change, and planning the change. Open-ended questions, affirmations, reflections, and summaries are essential strategies (Bray et al. 2013)

5. Children who are uncooperative or who have cavitated lesions on teeth nearing exfoliation and children with special health care needs for whom the risks of traditional care and behavior guidance strategies outweigh the potential benefits are the most appropriate candidates for nonoperative disease management

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Case 5

Early Childhood Caries Managed with Interim Therapeutic Restorations

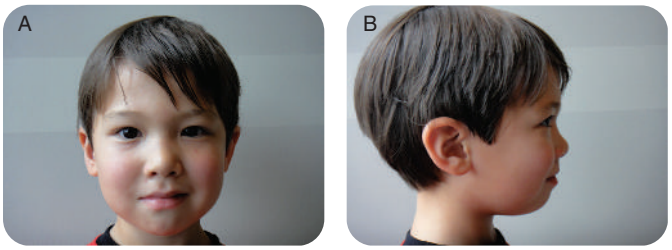

Figure 1.5.1 (A, B) Facial photographs.

A. Presenting Patient

- Thirty-four-month-old Asian male (Figure 1.5.1)

B. Chief Complaint

- Parents noticed "brown spots" on front teeth

C. Social History

- Second child
- Mother is primary caregiver
- Parents are married
- Both parents are employed and obtain regular dental care
- They have private dental insurance

D. Medical History

- Review of systems is within normal limits
- No allergies
- Child has previously taken amoxicillin for otitis media

E. Medical Consult

- Not applicable

F. Dental History

- Child has not seen a dentist yet for a routine visit
- Parents brush patient's teeth once a day with a nonfluoridated dentifrice
- Family lives in a fluoridated community
- Child has free access to sippy cup but does not use bottle

G. Extraoral Exam

- Head and neck examination within normal limits
- Height and weight within normal limits for age

H. Intraoral Exam

- Soft tissue within normal limits except for a few areas of gingival inflammation
- Eruption and occlusion of dentition within normal range for age with sixteen teeth erupted
- Carious lesions noted on the facial surfaces of maxillary right lateral, right central, and left central teeth (Figure 1.5.2)

Figure 1.5.2 Intraoral photograph showing carious lesions on the facial surfaces of the anterior teeth.

I. Diagnostic Tools

- Radiographs: maxillary periapical or occlusal (Figure 1.5.3)
- Caries Risk Assessment Tool

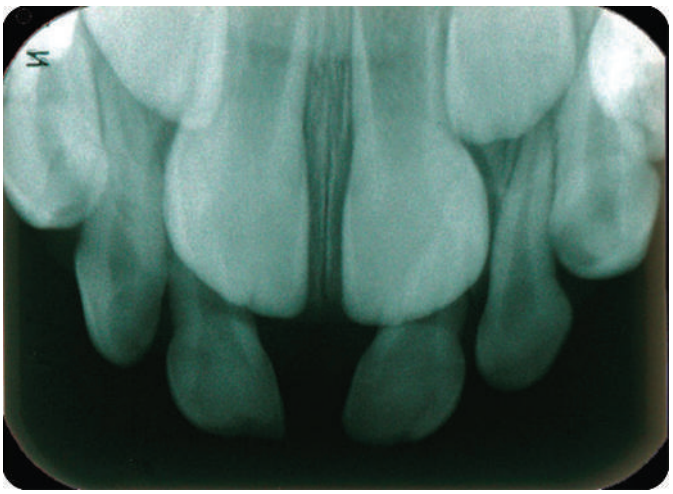

Figure 1.5.3 Maxillary periapical radiograph.

J. Differential Diagnosis

- Not applicable

K. Diagnosis and Problem List

Diagnosis

- Dental caries involving dentin on maxillary right lateral, right central, and left central incisors

Problem List

- Infrequent oral hygiene
- Free access to sippy cup containing juice
- Inability to cooperate for outpatient definitive dental restorations

L. Comprehensive Treatment Plan

- Oral hygiene instruction using brushing with smear of fluoridated dentifrice
- Dietary analysis and counseling with attention to sugar and frequency control
- Caries removal and restoration using interim therapeutic restoration (ITR) and glass ionomer cement (GIC)
- Recall interval of three months to assess outcomes and reinforce caries protective factors
- Behavior guidance using parent-assisted immobilization
- Application of fluoride varnish to teeth

FUNDAMENTAL POINT 1

Treatment Planning for Interim Therapeutic Restorations

- Carious lesions suited for ITR should be confined to dentin with sound enamel margins and no pulpal involvement
- ITR has the greatest success when applied to single surface or small two surface lesions

(American Academy of Pediatric Dentistry [AAPD] 2018–2019a,b)

M. Postoperative Intraoral Photographs

- Note tooth-colored ITR in Figure 1.5.4

Figure 1.5.4 Postoperative intraoral photograph showing completed treatment.

N. Prognosis and Discussion

- Oral hygiene should occur twice daily, once in the morning after breakfast and once before bed. The procedure should be done at a time and in a place that fits comfortably into this family's lifestyle. A rice-size amount of fluoride dentifrice should be used when brushing for topical effect. No rinsing should follow brushing to allow retention of fluoride in the oral cavity (American Dental Association 2014)
- Juice should be virtually eliminated from the child's diet and other sources of sugar should be reduced. Children at this age should have no more than 6 ounces of juice per day, preferably at meal times

BACKGROUND INFORMATION 1

Interim Therapeutic Restorations

- ITR is the proper term to describe treatment, in which follow-up and continued care are planned. Atraumatic or alternative restorative technique are terms to be reserved for situations in which this treatment may be the final therapy for the particular tooth
- ITR uses hand or rotary instruments to remove gross decay without local anesthetic. The cavity is restored with a GIC
- ITR is employed when conventional restoration and behavior management are not feasible
- ITR can be followed by conventional restoration later
- GIC is the material of choice because of its ease of use, compatibility with slight moisture, fluoride release, and chemical adhesion to tooth structure

(AAPD 2018–2019b)

- It is unlikely that this child would cooperate for traditional dental care in an outpatient setting. Therefore, the behavior guidance plan must include management of movement, so treatment can be completed. The risks of sedation or general anesthesia may not outweigh the benefits of providing definitive care given the child's age, weight, and limited treatment needs. Fortunately, the nature of the treatment planned is such that it can be achieved with protective stabilization, preferably using the parent in the knee-to-knee position, in one visit
- The minimal extent of caries and the well-defined lesions lend themselves well to the ITR technique. GIC has a fluoride-releasing property and can be of preventive, as well as restorative, benefit in this case

O. Common Complications and Alternative Treatment Plans

- ITR-type restorations may be lost and require reapplication. This can be due to incomplete removal of decay, compromised isolation, and excessive movement. Parents should be advised that this is not a definitive treatment and will require close follow-up and possible retreatment
- An alternative treatment plan might be to use sedation or general anesthesia. Parents should be made aware of the risks and benefits of these options. However, the minimal amount of treatment needed supports using ITR and protective stabilization.
- Nonoperative caries management with silver diamine fluoride is another treatment option if the family accepts what is likely to be a poor esthetic result
- Teeth can also be definitively treated. If the child's movement is minimal, a local anesthetic can be used followed by rotary instruments to completely remove decay. If salivary contamination can be avoided the teeth can be restored with a composite or other definitive restorative material

Self-Study Questions

1. What are current recommendations for inclusion of fluoride dentifrice in toothbrushing for children under three years of age?

2. What are properties of GIC that make them ideal for ITR?

3. What are some characteristics of fluoride varnish that make it superior to traditional gels and foams for use in a child of this age?

4. What record-keeping entries are recommended when using protective stabilization for a child for dental treatment?

5. What characteristics of sugar in the diet that can contribute to caries should be discussed with parents when making recommendations for its reduction?

Answers are located at the end of the case

Self-Study Answers

1. Caregivers should begin brushing children's teeth as soon as they erupt by using no more than a smear or "grain of rice" sized amount of fluoride dentifrice

2. Glass ionomers have several properties that make them ideal for this procedure. They are less sensitive to moisture in the cavity, release fluoride, and are adherent to dentin, and some formulations can be light-cured. They are also tooth colored and can provide esthetic restorations

3. Current fluoride varnish formulations have a more pleasant taste, are tooth colored, have a high concentration of fluoride, stay on the teeth longer, and do not require a prolonged period of time without drinking as do other formulations

4. When protective stabilization is used, the operator should record the reason for its use, the additional consent provided by parents, the type of stabilization, how long it was used and any side effects, and its efficacy

5. Sugar intake counseling should examine the types (sucrose or other sugars), amounts (quantified in number of exposures), consistency (liquid or solid), frequency, patterns (meals or snacks), accompanying foods (milk and cookies), and attempts at clearance or removal (brushing or rinsing)

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Case 6

Early Childhood Caries Managed with General Anesthesia

Figure 1.6.1 Intraoral photograph.

A. Presenting Patient

- Twenty-eight-month-old Caucasian male
- New patient visit

B. Chief Complaint

- Mother states, "My son has some bad teeth and his lip swelled up"

C. Social History

- Patient is in special needs preschool
- Parents are in their 40s, both employed
- No siblings
- Family lives in rural area
- Mother is the primary caregiver and works part-time
- Socioeconomic status is mid-level

D. Medical History

- Down syndrome
- Tetralogy of Fallot
- Medications: Digitalis
- Tentative and resistive behavior for all health care given

FUNDAMENTAL POINT 1

Medical History for Patients with Down Syndrome

- Obtain a thorough understanding of Down syndrome, including etiology, clinical presentation, systemic findings, and oral findings (Bay et al. 2007). See Chapter 9, Case 1 for more information on Down syndrome
- Cardiovascular abnormalities are common in patients with Down syndrome. Obtain a thorough understanding of any associated heart defects. For tetralogy of Fallot it is important to obtain information on the history of cardiac surgery, respiratory difficulty, medications, symptoms experienced by the patient, limitations or restrictions on any activities (Bernstein 2007)

E. Medical Consult

- Consult cardiologist and primary care physician regarding treatment. Discuss indication and contraindications for treatment under sedation or general anesthesia, medication alteration, and any concerns about antibiotic coverage for infective endocarditis

BACKGROUND INFORMATION 1

Down Syndrome and Tetralogy of Fallot

Down Syndrome

- Down syndrome is a genetic disorder caused by trisomy 21
- Down syndrome is associated with below average intellectual functioning, short stature, tendency toward obesity, immune dysfunction, low-set ears, and cardiac defects
- Oral findings in Down syndrome include open mouth, protruding tongue, hypoplastic maxilla, missing and conical teeth, and precocious periodontal disease
- Behavior guidance in the dental setting due to intellectual deficits may be a problem (Weddell et al. 2016)

Tetralogy of Fallot

- The four characteristics of tetralogy are overriding aorta, ventriculoseptal defect, pulmonary stenosis, and right ventricular hypertrophy
- Tetralogy of Fallot is considered a complex cyanotic cardiac condition and requires antibiotic coverage for bacteremia-inducing dental treatment

Tet spells are transient and often unpredictable episodes of respiratory difficulty where the child can develop deep blue skin, nails and lips, and can be life threatening (Bernstein 2007; Wilson et al. 2007)

- For more information on congenital heart defects see Chapter 8, Case 1

F. Dental History

- No history of previous visit
- Optimal water fluoridation levels
- Highly cariogenic diet
- Brushing with fluoride toothpaste by parents once per day

G. Extraoral Exam

- Open mouth posture
- No other significant findings

H. Intraoral Exam (Figure 1.6.1)

- Primary dentition
- Occlusion: class III primary molars, no crowding, class III canines
- Oral hygiene is poor
- Gingival tissue with moderate gingivitis
- Moderate plaque accumulation
- Dental caries in anterior and posterior teeth

FUNDAMENTAL POINT 2

Oral Health Considerations for Patients with Down Syndrome

- Behavior management alternatives must be addressed. Strategies may be complicated by possible hearing problems that are often associated with Down syndrome
- Congenital heart conditions may require antibiotic coverage
- Down syndrome patients tend to be mouth breathers. This can lead to:
  - Reduction in salivary flow
  - Increased caries risk
  - Increased risk for gingivitis

(Weddell et al. 2016)

I. Diagnostic Tools (Figure 1.6.2 A-F)

- Maxillary and mandibular occlusal radiographs
- Four periapical radiographs of posterior quadrants

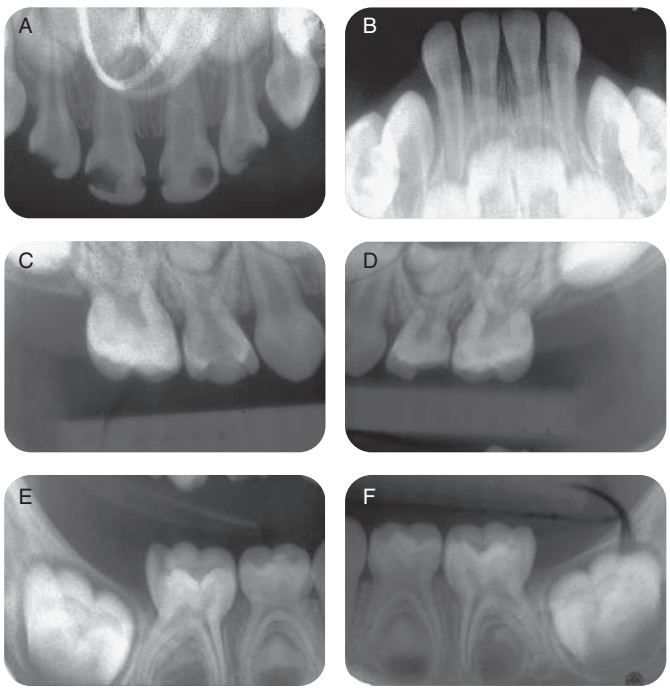

Figure 1.6.2 (A–F) Radiographs showing carious lesions.

FUNDAMENTAL POINT 3

Radiographs in Preschool Children

- The American Academy of Pediatric Dentistry (AAPD) recommends a radiograph examination that includes selected periapical/occlusal/bitewing views (AAPD 2018–2019a)
- The American Dental Association (ADA) also has radiography guidelines similar to those of the AAPD (ADA 2012)

J. Differential Diagnosis

- Not applicable

K. Diagnosis and Problem List

Diagnosis

- Down syndrome
- Tetralogy of Fallot
- Dental caries

Problem List

- High caries risk due to existing caries and special needs
- Requires antibiotic coverage for invasive dental treatment
- Potentially uncooperative behavior
- Existing dental caries

L. Comprehensive Treatment Plan

- Establish a dental home
- Dental prophylaxis
- Fluoride treatment with fluoride varnish
- Review of oral hygiene (with parent and child)
- Restoration of all carious lesions under general anesthesia due to extent of decay, inability to cooperate for outpatient treatment, and complex medical history
- Three-month recall
  - Re-evaluate caries risk
  - Re-evaluate compliance with caries prevention plan

M. Prognosis and Discussion

- The prognosis for caries is guarded due to poor oral hygiene and child's special needs. Prognosis could be improved with diet modification, better oral hygiene, and more frequent recall visits for preventive therapy

FUNDAMENTAL POINT 4

Caries Management and Treatment in Patients with Down Syndrome

Caries Risk

- Use American Academy of Pediatric Dentistry Caries Risk Assessment form in assigning a patient's risk category (AAPD 2018–2019b)
- Utilize the chronic disease management model to address the caries process

Infective Endocarditis Prevention

- Use American Heart Association (AHA) guidelines for selection of appropriate antibiotic coverage for dental treatment (Wilson et al. 2007)

Behavior

- Use AAPD Guidelines on Management of Persons with Special Health Care Needs and Behavior Guidance for the Pediatric Dental Patient (AAPD 2018–2019c,d)

- The prognosis for improved behavior is also guarded due to the nature of the syndrome, with its lifelong limited intellectual functioning
- Dental treatment will continue to require antibiotic coverage due to the nature of the cardiac defect and its high risk for infective endocarditis

N. Complications and Alternative Treatment Plans

- How would behavior guidance recommendations differ if the patient were cooperative for dental care, but with the same disease levels?
- What other treatment modalities may be utilized to arrest carious lesions if general anesthesia was not an option?
- Would antibiotic coverage be required for preventive care?
- How does the child's complex cyanotic heart defect influence treatment recommendations for severely decayed primary teeth with pulpal involvement?

Self-Study Questions

1. What are some important questions that need to be asked when taking a medical history with a patient who has severe cardiac disease?

2. What are some other cardiac conditions requiring infective endocarditis prophylaxis?

3. List five oral manifestations found in patients with Down syndrome

4. What are considerations for radiographic examination in this patient?

5. What are the three categories of information used to make a caries risk assessment as defined by the American Academy of Pediatric Dentistry?

Answers are located at the end of the case

Self-Study Answers

1. Description and name of the condition, previous treatment, cardiologist contact, limitations and other morbidity, medication(s) the patient takes and the frequency

2. The AHA considers prosthetic valves, previous infective endocarditis, complex cyanotic heart disease, and surgically constructed shunts and conduits as high risk; acquired valvular dysfunction, hypertrophic cardiomyopathy, and mitral valve prolapse with regurgitation are considered moderate risk

3. Down syndrome patients tend to be mouth breathers, have a relative mandibular prognathism, small and conical teeth, retained primary teeth, large and protruding tongues, small maxilla, and precocious periodontal disease

4. Some of the factors considered in choosing a radiographic survey include cooperation, number and placement of teeth present, contacts between teeth, and existing disease

5. Biological factors, protective factors, and clinical findings

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