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CHAPTER 38

Dental Complications

Ronald E. Schneider

Andrew S. Kaplan

Jack Klatell

R.E. Schneider, A.S. Kaplan, and J. Klatell: Mount Sinai School of Medicine, Mount Sinai Hospital, New York, NY.

The complex alterations of body physiology and chemistry that accompany pregnancy can affect the oral cavity and the dental apparatus. The extent of these changes is largely dependent on the previous health of the mouth and the thoroughness with which preventive measures have been employed before conception as well as during the stressful period of gestation.

Over the centuries, people's interest in pregnancy and childbirth has built up a mystique compounded of myth and conjecture about dental issues, intermixed with scientific facts gleaned from research. It was not so long ago that pregnant women were assured that they could expect to lose a tooth for every child. It also seemed reasonable that the nausea and vomiting of morning sickness and its attempted control with crackers or biscuits or other cariogenic foods would create an oral environment conducive to tooth decalcification and decay. Objective studies do not support this notion of inevitable tooth loss. However, there are some actual or potential dental and oral complications of pregnancy of which the physician, the dentist, and the patient should be aware. All concerned must cooperate to provide safe dental care to the expectant mother without harming the fetus.

CARIES, GINGIVITIS, AND PERIODONTAL DISEASE

The pregnant woman is subject to all the dental disorders that afflict other patients. The oral flora might be somewhat changed, as may some dietary routines, but the caries process is not significantly altered during pregnancy. The notion that pregnant women are more susceptible to tooth decay has not been borne out by research. Although minerals can be withdrawn from any part of the bony skeleton, the teeth are not generally affected. The mineral content of dentin (1,2) and enamel remain unchanged throughout pregnancy. Routine prevention and treatment of carious lesions must be performed as conscientiously for the pregnant as for the nonpregnant patient (3). Daily rinses with sodium fluoride and chlorhexidine have been effective in caries prevention (4). Recent studies suggest that the benefits of improved oral health and reduced cariogenic oral flora in the mother also result in better oral health in their children (5,6,7 and 8).

It has long been known that the endocrine system affects the gingiva and periodontal tissues. The relationship of pregnancy to changes in these tissues has been studied in great detail (9,10,11,12,13 and 14). The gingival changes most commonly seen in pregnant women are referred to as pregnancy gingivitis. The changes are first seen in the second month of pregnancy and peak in the middle of the last trimester. Although the gingivitis will frequently disappear spontaneously after parturition, this

to 6 months after delivery. It has been reported that between 30% and 100% (15) of pregnant women are affected by this condition. The discrepancies in these statistics can be attributed to variations in research methodology and clinical judgment in identifying affected women.

Pregnancy gingivitis manifests as marginal inflammation of the attached gingiva and the interdental papillae. The tissues appear smooth, shiny, and swollen and are bright to bluish red in color (Fig. 38-1). They are compressible and have a strong tendency to bleed with probing or with brushing. Accompanying these changes, there might be increases in tooth mobility, in gingival crevicular fluid, and in periodontal pocket depth (10,12,15). These changes are generally painless and are usually accompanied by the accumulation of plaque and calculus. The tooth mobility is normally transient (15).



FIG. 38-1. Pregnancy gingivitis. Note the inflammation of interdental and marginal gingiva

This form of gingivitis appears to be hormone modulated, an exaggerated response to local factors, such as oral deposits, plaque, and calculus (9,10). Hormones can interfere with mechanisms of action that respond to inflammatory challenges, such as the production of interleukin (12). The condition varies with the adequacy of local therapy and the hormonal changes experienced throughout the course of pregnancy. Meticulous oral hygiene can either prevent or markedly minimize the occurrence of pregnancy gingivitis. The obstetrician should encourage the patient to seek dental advice and to practice conscientious oral hygiene. Patients prone to this problem might need to use hygiene aids, such as an interdental stimulator or an oral irrigation device in addition to the routine use of a toothbrush and dental floss.

If the patient shows signs of gingivitis in the early stages of pregnancy, she might best be treated by the dentist with scaling and curettage. This treatment removes local irritants that cannot be removed with a toothbrush, thereby decreasing the local factors contributing to the exaggerated inflammatory changes. The gingival tissues can be very sensitive to this type of manipulation, and local anesthetic is sometimes needed. Methods to prevent or treat pregnancy gingivitis should be initiated at the earliest possible opportunity. Waiting until the termination of pregnancy risks permanent periodontal

destruction (11,15,16). Explaining the nature of this process to the patient will usually result in better home care.

PREGNANCY TUMOR

A second pathologic gingival condition arising during pregnancy is the angiogranuloma, or pregnancy tumor. This localized enlargement appears in 3% to 5% of pregnant women (17), generally between the third and ninth months of pregnancy, and gradually increases in size. After delivery, these lesions tend to regress, but they can persist as a scarred epulis or fibroma. As is the case with pregnancy gingivitis, the cause is thought to be an intensified reaction to local irritation due to the effects of hormonal change.

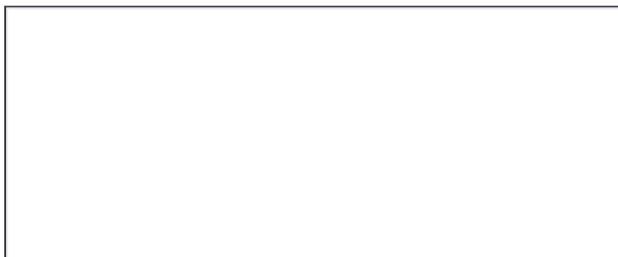
Pregnancy tumors most frequently appear on the gingiva and, in particular, tend to originate between the teeth in the interdental papillae (Fig. 38-2). They might also be present on the tongue, palate, buccal mucosa, and lips (17). The clinical manifestation is a soft, flattened, pedunculated mass that is deep red in color, with a smooth surface. The lesion is usually painless unless its size or location interferes with chewing, swallowing, or speaking, in which case painful ulceration may ensue. On histologic

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examination, the pregnancy tumor resembles a pyogenic granuloma (Fig. 38-3). The raised mass has a central area of connective tissue rich in thin-walled blood vessels and covered by a zone of stratified squamous epithelium. An acute inflammatory infiltrate is present only in those cases that are mechanically traumatized, in which case the epithelium might also be ulcerated.



FIG. 38-2. Pregnancy tumor.



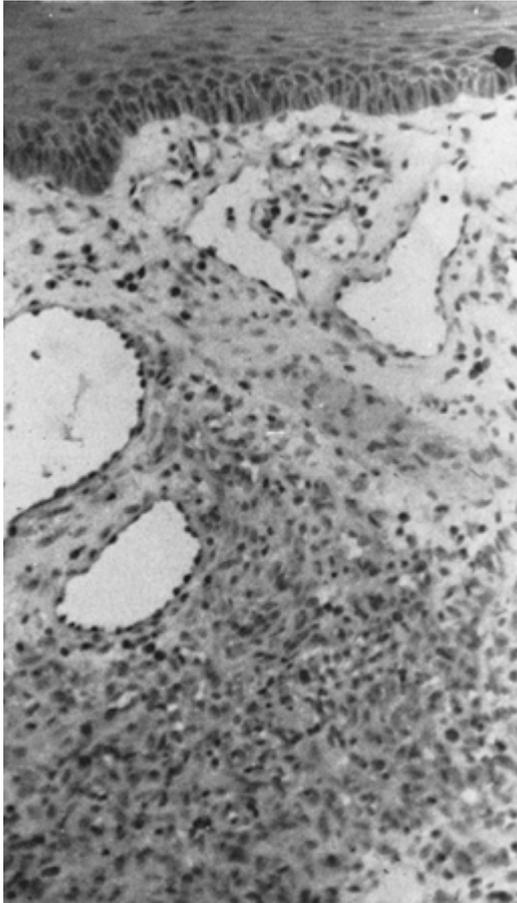


FIG. 38-3. Histologic section of a pregnancy tumor

Pregnancy tumors can be minimized by fastidious oral hygiene, and patients should be instructed in such hygiene and encouraged to work at it. Once tumors have occurred, the areas should be scaled and curetted to remove local irritants. Local anesthesia can be used. Should the pregnancy tumor be large and a continuing source of pain or infection owing to its interference with masticatory function, surgical removal is indicated. The patient should be warned of possible recurrence.

DENTAL TREATMENT CONSIDERATIONS

There are several issues to consider when addressing the risks and benefits of rendering dental care during pregnancy. Treatment might expose the mother to pain, stress, ionizing radiation, or medications. Delaying treatment could risk pain, infection, or even loss of teeth. In general, most elective dental procedures should be postponed until the second trimester, but the potential benefit of delaying any exposure of the fetus to risk is weighed against the risks of delaying the treatment. There is no significant problem with delaying many routine dental procedures, such as repair of small carious lesions, but some conditions require estimations of how rapidly the disease process will progress in order to make the best judgment about the timing of therapy. Guessing incorrectly about the progression rate can risk irreversible damage to the structures of the oral cavity or change a

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routine treatment into a more complicated one. The patient's obstetrician should be consulted to determine whether there are any special considerations or risks with regard to a particular patient.

Because treatment is usually performed with the patient seated or reclining in the dental chair, the dentist should be aware that pregnant women undergoing treatment can manifest symptoms of the supine hypotensive syndrome, particularly during the third trimester (18). This syndrome is generally evidenced by a loss of consciousness due to the pressure of the gravid uterus on the great vessels, causing poor venous return to the heart. Prevention and treatment are to turn the patient on her side, thus reestablishing venous return. The supine hypotensive syndrome occurs in approximately 10% of pregnant women during the third trimester. Even for those women who do not become manifestly hypotensive, lying supine can result in reduced uterine blood flow and potential fetal jeopardy. Thus, the supine position should always be avoided during dental work in the second half of pregnancy. Placing a wedge under the patient's right hip when she is reclining in the chair will usually serve to obviate this problem. Short appointments should be encouraged whenever possible (19).

Dental Radiography

The dentist always attempts to minimize exposure of patients to the ionizing radiation from dental radiography. The standards for radiographic evaluation have evolved to reflect this principle. Faster film speeds, higher beam energies, dental radiographic and panoramic machines with beam collimation, and the routine use of lead aprons all have contributed to less exposure for all dental patients. The two main concerns are risk when genetic tissues are exposed to radiation and risks to the somatic tissues (20). The uterine exposure for a full mouth series of radiographs is estimated to be less than 0.01 μ Gy, far less than the dose thought to be the threshold for risk of mental retardation (19,20). It is rare for a full mouth series to be taken in the pregnant patient.

A typical examination using one to four periapical radiographs or a panoramic radiograph would reduce the exposure to 75% less than the full mouth series. Using proper methods, the risk to the fetus is considered to be nonexistent. The use of old equipment with short cones, not using a lead apron, and poor positioning could raise that risk (21). Diagnostic radiography is an important aspect of evaluation and treatment planning. Expert panels of representatives from all areas of dentistry under the sponsorship of the Food and Drug Administration have stated that the recommendations for radiographic guidelines do not need to be altered for the pregnant patient (22,23).

For the pregnant patient who is also a dental health care worker, the concern is for repeated exposure over time. Maximum doses have been calculated for the pregnant and nonpregnant dental health care worker. The maximum permissible dose for the pregnant health care worker is one-tenth of the normal dose recommended for nonpregnant dental health care workers. Proper radiation safety precautions, such as shielding, barriers, and periodic equipment testing should always be followed (22).

Medications

There is always a concern that drugs or other chemical substances taken by the mother will affect the fetus. Although one could eliminate all risks by avoiding all drugs, the pregnant dental patient is still likely to need medications for treatment. Local anesthetic agents are commonly used for either routine dental care or for management of dental emergencies. There are many areas of the country where patients are seen by their dentist only in the context of an emergency, usually a toothache or an abscess. Treatment of these problems generally requires antibiotic therapy and, frequently, analgesics. Although they are rarely necessary, nitrous oxide or other anesthetic agents might also be used.

Local Anesthesia

For most patients, dental treatment is difficult to tolerate without a local anesthetic. Fortunately, in the volumes and concentrations used in dentistry, local anesthetics are very safe (24). At normal doses, no adverse reactions have been reported with lidocaine (Xylocaine) or mepivacaine

(Carbocaine) alone and in combination with epinephrine. Schneider and Webster (25) have shown no statistically significant increase in complications in pregnant women who received surgical treatment using local anesthesia. Nevertheless, the dentist must be careful to use solutions with minimal amounts of vasoconstrictor injected slowly and after careful aspiration. With these safeguards, local anesthesia offers little risk to the pregnant patient. Accidental intravenous injection of epinephrine can diminish uterine blood flow; local anesthetics should be used without epinephrine when clinically feasible.

Nitrous Oxide and Anesthetic Agents

There are circumstances in which the inhalation agent nitrous oxide or other anesthetic agents are considered for the treatment of dental problems. There are dental phobic patients who have great difficulty facing even routine dental treatment without some antianxiety aid. For most of these dental phobics, the anxiety does not abate with pregnancy. There are also conditions, such as dental abscesses or prolonged toothaches, in which local anesthesia is not fully effective. Nitrous oxide is commonly available in dental offices and has been extensively and

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effectively used to facilitate dental treatment. It is generally considered safe, particularly with short procedures. There is no respiratory depression, and supplemental oxygen is automatically delivered with nitrous oxide. The risks of chronic exposure are generally more of a concern than the use for a single short procedure. It has been suggested that nitrous oxide is a factor in spontaneous abortions in health care workers chronically exposed.

Nitrous oxide can be very effective for anxiety management and somewhat effective for mild pain, particularly when there is an anxiety component. It has limited use in the management of moderately to severely painful procedures. For those painful procedures in which local anesthesia is not a viable option, sedation or general anesthesia might be necessary. Most studies support the safety of modern general anesthetic and sedative agents (26) in pregnant women (see Chapter 55).

Analgesic Therapy

With its low risk of side effect or complication, acetaminophen has been a mainstay of analgesic therapy for the pregnant patient. There are dental conditions, such as toothaches, in which pain is poorly controlled with acetaminophen. Short courses of narcotics are used effectively in these circumstances. Although some studies have suggested that malformations are associated with codeine use in early pregnancy in animals (27), the acetaminophen with codeine preparation remains a popular short-term pain medication for dental problems and probably carries negligible risk to the pregnancy. Oxycodone and hydrocodone preparations can also be used (19,28). There is concern that the narcotic can produce respiratory depression in the neonate if taken close to the time of delivery. It should be noted that most of these complications are dose and frequency dependent (29).

Antibiotic Therapy

Penicillin, clindamycin, and erythromycin are the most frequently used antibiotics for treatment of infections of dental origin. Fortunately, no serious adverse effects of penicillin or clindamycin have been reported (19), except for allergic reactions and the risk of pseudomembranous colitis. Erythromycin estolate is less effective than either penicillin or clindamycin for most dental infections and is associated with potential hepatotoxicity. Streptomycin can lead to hearing loss in the fetus, and its use should be avoided. Other aminoglycosides are preferable if such coverage is necessary. If substantial amounts of tetracycline are administered to a pregnant woman during the second or third trimester, the developing deciduous teeth of the child can be discolored. Depending on the dosage (1), the teeth will appear yellowish to brownish-gray. While such teeth are structurally strong, the cosmetic detriment is significant.

Fluoride Supplementation

The effect of fluorides in reducing dental decay is well known (8,30). It might be reasoned that if a woman takes fluoride supplements during pregnancy and if the fluoride passes the placental barrier, it might impart resistance to dental caries to the baby. Research has generally supported this contention (4,5,27), but it is still a matter of debate. Fluoride-supplemented drinking water alone provides little exposure of the fetal teeth to fluoride (5). Supplementing during pregnancy with 1 mg/day by tablet will cause the developing deciduous teeth to acquire greater mineralization and an increased fluoride concentration in the hard tissues. At doses above 1 mg/day, the amniotic levels increase to near that of the maternal plasma (31). A greater concern is the rise of fluorosis (21) as the result of oversupplementation, usually because of a combination of fluoride drops and community fluoride-supplemented water supplies. It is not considered a health risk because there is no functional compromise of the teeth, but the discoloration of the teeth is a concern for children and parents.

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