

REVIEW ARTICLE

Orthodontic Treatment Considerations in Pregnancy: An Insight

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ABSTRACT

Introduction: This article presents an insight on little known fact regarding orthodontic treatment in pregnancy and to find literature support in favor regarding orthodontic treatment during pregnancy. Literature was reviewed extensively to get results dental and orthodontic treatment during pregnancy.

Discussion: Nowadays there are many adult patients seeking orthodontic treatment because of increase in awareness. In these adult patients, there are many pregnant females coming to orthodontist for treatment or a lady getting pregnant during the treatment. 'Can a pregnant woman continue with orthodontic treatment or can she start with orthodontic treatment during pregnancy?' This is a difficult question to answer but 'Yes', pregnant women can go for orthodontic treatment but with precautions. Present article gives us the information how to go about the treatment in pregnant women, the precautions to be taken, effect of drugs and hormonal changes on orthodontic treatment.

Conclusion: Pregnant women can go for orthodontic treatment but with some precaution and some systemic and local condition limit the treatment modalities.

Keywords: Pregnancy, Orthodontist role, Pregnancy gingivitis, Tooth movement, Hormones.

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INTRODUCTION

In the last few years, considerable interest has been developed toward orthodontic treatment in adult patient. A recent survey conducted by the AAO showed an increase in the percentage of patients over 21 years of age from—a fraction more than 4%, 10 years ago, to almost 7% today. Nearly 11% is expected after another decade.¹ There are many reasons why adult orthodontic therapy should be encouraged, including the improvement of function and occlusion, and improvement of esthetics, as well as the psychological aspects. Many adults did not have an opportunity to be treated orthodontically when they were young, some because of lack of information and many because of lack of financial resources. But with the increase in awareness, willingness to look good and increase in financial resources such as health insurances, more and more adult patients are seeking orthodontic treatment. They are more cooperative about keeping appointments, taking care

of their appliances, maintaining good oral hygiene and following instructions.² With increase in adult patients seeking orthodontic treatment there are many female patients compared to male due to esthetic concern and in such situation incidences of pregnant females coming to orthodontist for treatment is also more. At this point a big question arise—is pregnancy a contraindication for orthodontic treatment? The answer to this question is 'NO', pregnant women can go for orthodontic treatment but with precautions.

Pregnancy is one of the most wonderful phases in a woman's life. It's a common saying 'when you look good, you feel good'. It is important for the pregnant woman to not only look good but also to feel good inside out as this will have a whole lot of impact on her well-being as well as that of her unborn child. When you have teeth that are in a straight line, there is no end to your smile. Therefore, if you have decided to have braces and discover that you are expecting a child, there is no reason to stop with your braces. Both of these can work side by side and will be the most wonderful and life changing experiences for you.

Certain factors that need to be kept in mind before going ahead with braces in pregnant women are:

1. Pregnancy associated gingivitis.
2. Hormonal changes and its affect on tooth movement.
3. Food habits and craving during pregnancy and its affect on orthodontic treatment.
4. Effect of drugs in pregnancy and orthodontic movement.

Gingival Health and Pregnancy

Gingivitis is caused by several known systemic and local factors. Among systemic factors, the role of hormonal changes during pregnancy is well-established.³ While presence of fixed orthodontic appliances alone may not cause gingivitis factors, such as pregnancy and poor oral hygiene combined together could precipitate acute gingival inflammation that may progress to a poor periodontal condition in a patient receiving orthodontic therapy.⁴ Gingivitis and gingival hyperplasia have been associated with hormonal changes as seen during puberty, pregnancy and menopause.⁵⁻⁹ Studies have shown that pregnant women have an increased incidence of gingival inflammation compared with nonpregnant women.^{10,11} Progesterone has been shown to increase gingival exudates, affect the gingival vascularity and integrity of the capillary endothelial cells.^{12,13} Sex hormone-induced alterations in the

subgingival microflora lead to an increase in periodontal inflammation.^{14,15} During pregnancy, there could be immunosuppression where CD4:CD8 ratios may be decreased and there could also be low lymphocyte responsiveness.^{16,17} The presence of increased sex hormones during pregnancy may cause epithelial separation and an increase in vascular permeability. Vascular and hormonal changes may increase the gingival crevicular fluid and aggravate response to plaque.¹⁸ It is known that fixed appliances can act as plaque-retaining devices. However, when coupled with preexisting gingival inflammation that may be present in a pregnant patient, there could be fast progression toward periodontal disease. There is also an additional factor of self-neglect among pregnant women. While there is literature to support that oral health of women is not optimal during pregnancy and after childbirth, there have been three case—control cohort and cross-sectional studies that have demonstrated that periodontal disease may be a potential independent risk factor for preterm low-birth-weight babies.^{19,20} Thus, it is of paramount importance to create awareness in the dental profession and also to educate women about the importance of oral health care during orthodontic therapy especially if they are pregnant.

Effect of Hormones on Tooth Movement

Eva Hellsing and Lars Hammarström did experiments in rats indicated that the velocity of orthodontic tooth movement is influenced by hormones as well as trace elements. Orthodontic movement occurs faster in pregnant rats compared with nonpregnant rats.²

Hua Xi Kou Qiang Yi Xue Za Zhi. 1998 studied the effect of progesterone on orthodontic tooth movement. He found that progesterone influence the periodontal reconstruction on orthodontic tooth movements in pregnant rats and may be helpful in alveolar bone formation.³ Long-term progesterone administration could reduce the rate of tooth movement.²¹

Estrogen results in decreasing the rate of bone resorption. Estrogen inhibit the production of various cytokines, mainly interleukin – (IL-1), (TNF- α) tumor necrosis factor – alpha, and interleukin – 6 (IL-6), which are involved in bone resorption by stimulating osteoclast formation and osteoclastic bone resorption. Thus, estrogens decrease the velocity of tooth movement.²²

Relaxin has been known as a pregnancy hormone. It is released just before child birth to loosen the pubic symphysis, so that the relaxed suture will allow widening of the birth canal for parturition. Relaxin influence on soft tissue remodeling and several mediators that stimulate osteoclasts formation. Administration of relaxin might accelerate the early stages of orthodontic tooth movements. Relaxin might

be used as an adjunct to orthodontic therapy, during or after tooth movement, for promotion of stability, for rapid remodeling of gingival tissue during extraction space closure, for orthopedic expansion in nongrowing patients, by reducing the tension of the stretched soft tissue envelope, particularly the expanded palatal mucosa, after orthognathic surgery.^{23,24}

Management of Oral Health in Pregnancy with Braces

In case of pregnancy, it is important to get the opinion of the gynecologist, if any known complications are to be expected. A complete dental history provides the orthodontist knowledge about the patient's attitude toward dental care and patient's priorities. A patient who does not receive routine dental care and is negligent about oral care is unlikely to be compliant during orthodontic treatment. As the number of adult patients seeking orthodontic treatment is on an increase, it is important that the orthodontists must be more active and capable of diagnosing gingival and periodontal problems. If the patient already has signs, such as gingival inflammation, bleeding on probing, presence of pockets and poor oral hygiene, it may be wise to start orthodontic therapy after the pregnancy. However, there are no obvious contraindications to orthodontic therapy in a healthy pregnant patient. However, it may be advisable to limit the visits to shorter appointments to avoid the patient being in extreme supine position especially during the later stages of the pregnancy. Radiographic imaging, such as a panoramic film and periapical films are routinely used to assess periodontal health and root inclinations. According to American Dental Association (ADA), every precaution should be taken to minimize radiation during pregnancy. It is important for the orthodontist to know, if the patient is self-motivated and enthusiastic about receiving orthodontic treatment. It is especially important to take into account the hormonal and physiological changes that will be anticipated during the course of pregnancy and the patient must be mentally prepared to visit the orthodontist for regular adjustments.²⁴ It is critical to discuss in depth about the entire course of the treatment, the expected number of visits and the level of cooperation that will be required for successful completion of orthodontic treatment to achieve ideal function and esthetics.

Oral Hygiene Maintenance during Orthodontic Treatment

Before starting orthodontic treatment, any preexisting periodontal condition must be addressed. Because of pre-existing hormonal conditions during pregnancy, the gingival

tissues may be already inflamed. Thus, a more rigorous oral hygiene will be required routinely to maintain optimal oral health. Frequent dental prophylaxis will be helpful and meticulous home-care regimens will need to be employed to ensure success. In addition to tooth brushing, a detailed instruction in the manipulation of dental floss will enable the patient to floss when the braces are in the mouth. Many interdental cleaning aids, such as tooth picks or miniature bottle brushes can be attached to handles for the convenience of manipulation around teeth.⁸ Thus, oral hygiene regimen maintained at home and coupled with professional dental cleaning will ensure successful oral health and keep orthodontic patients during pregnancy free of gingival and periodontal disease during active treatment.

Patient motivation is very important for oral hygiene maintenance. Thus, constant motivation of the patient could help improve patient compliance during orthodontic treatment. Especially during orthodontic treatment, which is over a period of a couple of years, constant reinforcement and periodic monitoring and occasional discussions with the patient are extremely crucial. Most importantly, there needs to be a psychological change and motivation in the patient that will make them conscious about their oral hygiene status. It is important to emphasize that professional tooth cleaning alone is not sufficient for preventing gingival and periodontal issues and conscientious oral home care is also of paramount importance. Thus, a combination of professional tooth cleaning and educational reinforcement of oral hygiene will prove to be successful.

Drugs during Pregnancy and Orthodontic Treatment

A history of current medications is also valuable because various drugs have oral side effects and may influence the course of the orthodontic therapy. Drugs, such as bisphosphonates and vitamin D metabolites could probably cause a reduction in tooth movement during orthodontic therapy, while nonsteroidal anti-inflammatory drugs have also been shown to reduce bone resorption.²⁵⁻²⁷ Any previous medical conditions such as diabetes mellitus or previous pregnancy complications are important to know in advance before starting orthodontic treatment. If the patient has suffered previously from certain complications during her pregnancy and is at a risk as per her medical care provider, it may be best to wait until postpartum to start orthodontic therapy.²⁸⁻³⁰

Role of Professionals

For successful completion of orthodontic treatment, a good communication must be established between the patient and

the orthodontist from the beginning. In addition to reinforcing oral hygiene, it is important that the patient is sent for professional cleaning at regular intervals. Good communication among health care professionals also benefits the patient and improves their quality of life.

Role of Patient

It is important for women to be aware of the importance of oral health care especially during pregnancy. We have therefore described in detail the known associations between periodontal disease and complications during pregnancy. Simple and effective home-care measures described earlier and professional dental care will enable women to prevent any gingival and D or periodontal issues during the course of their orthodontic treatment.

Pregnancy, as such is not a contraindication for orthodontic treatment. Care should be taken to minimize the potential exaggerated inflammatory response related to pregnancy-associated hormonal alterations. Meticulous plaque control and oral hygiene should be maintained during treatment. Avoid X-rays or drug therapy and extractions particularly in the first trimester. The second trimester is the safest time to perform treatment. Avoid supine position in late pregnancy. Supine hypotensive syndrome may occur due to obstruction of the vena cava and aorta. This may result in reduction in return cardiac blood supply with decreased placental perfusion. This can be prevented by placing the patient on her left side or simply by elevating the right hip 5 to 6 inches during treatment. Appointments should be short, and the patient should be allowed to change positions frequently. A fully reclined position should be avoided if possible.

However, long, stressful appointments and surgical procedures should be delayed until the postpartum period. Analgesics, antibiotics, local anesthetics, and other drugs required during pregnancy should be reviewed for potential adverse effects on the fetus.

CONCLUSION

From literature review and case report, it has been found that orthodontic treatment during pregnancy may aggravate gingivitis caused by local and systemic factors. Periodontitis during pregnancy may lead to complications during pregnancy and preterm low-birth-weight babies. Awareness among oral and prenatal health care professionals is critical for optimal patient care.

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