

# Considerations for the orthodontic treatment during pregnancy

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## ABSTRACT

Pregnant women are advised against doing many things during their pregnancy, from taking certain types of medication, to eating some foods. However, there is no real reason why pregnant women should not have orthodontic treatment. For pregnant women orthodontic treatment is typically considered to be a safe, but with some precaution. Some local and systemic conditions limit the treatment modalities. There are some considerations for pregnant women to take into account. Sensitivity is often heightened during pregnancy and this may mean that braces seem a little more uncomfortable than usual; it is also worth bearing in mind that most painkillers are off-limits during pregnancy and hence patient will have to battle through any pain without taking medication. Hormonal changes in the body during pregnancy can increase the risk of swollen, sore gums and braces may irritate the gums. Hormonal changes and drugs can affect the orthodontic tooth movement. If patient have braces are pregnant and have concerns about their braces, it is important for patients to see their orthodontist on a regular basis during pregnancy.

**Key words:** Hormonal changes, orthodontic treatment, pregnancy, tooth movement

## Introduction

With increase in adult patients seeking orthodontic treatment there are many female patients compared with male due to esthetic concern and in such situation incidence of pregnant females coming to the orthodontist for treatment is also more. At this point, a big question arise-is pregnancy a contraindication for orthodontic treatment? A pregnant woman generally considered to be a safe for orthodontic treatment are but with some precaution. Pregnancy is one of the most wonderful phases in a woman's life. It is 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. Certain factors that need to be kept in mind before going ahead with braces in pregnant women are:

1. Pregnancy induced gingivitis and periodontitis.
2. Hormonal changes affect tooth movement.
3. Eating habit and craving during pregnancy and its affect on orthodontic treatment.
4. Effect of various drugs in pregnancy and tooth movement.

## Medical, Dental and Psycho-Social History

Like any other form of dental care, before starting orthodontic therapy, a thorough and detailed medical history is critical. However, in case of pregnancy, it is important to get the opinion of the gynecologist if any known complications are to be expected. 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 non-steroidal anti-inflammatory drugs, hormone supplements and vitamin D metabolites could probably cause a reduction in tooth movement during orthodontic therapy. Any previous medical conditions such as diabetes mellitus or previous pregnancy complications are important to know in advance before starting orthodontic treatment.<sup>[1,2]</sup>

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A complete dental history provides the orthodontist knowledge about the patient's attitude towards dental-care and patient's priorities. 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 and poor oral hygiene, it may be wise to start orthodontic therapy after the pregnancy.

Patient's perception of their own health is considered to be an important aspect of their psychosocial make up and potential compliance. 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.

## Orthodontic Considerations for Gingival Health During Pregnancy

Gingivitis is caused by several known systemic and local factors. Among systemic factors, the role of hormonal changes during pregnancy is well-established. Although, the presence of fixed orthodontic appliances alone may not cause gingivitis, factors like pregnancy and poor oral hygiene combined together could precipitate acute gingival inflammation that may progress to a periodontal condition in a patient receiving orthodontic therapy. Orthodontic appliances could act as a potential plaque retentive source and aggravate inflammatory reactions that are seen during pregnancy. There is a lack of awareness regarding oral health-care issues among patients who are pregnant and choose to seek orthodontic treatment. In addition, there is a need in the literature to outline management guidelines for patients who want to receive orthodontic treatment during pregnancy, with or without preexisting gingival conditions. Our emphasis is on patient education, oral hygiene maintenance and preventive and treatment strategies for the management of gingival health in orthodontic patients during pregnancy.

## Effect of Hormones on Orthodontic Treatment

### Progesterone

Velocity of orthodontic tooth movement (OTM) is influenced by hormones as well as trace elements. Orthodontic movement occurs faster in pregnant rats compared with non-pregnant rats.<sup>[3]</sup> He *et al.* studied the effect of progesterone on OTM. He found that progesterone influence the periodontal reconstruction

on OTMs in pregnant rats and may be helpful in alveolar bone formation.<sup>[4]</sup> Long-term progesterone administration could reduce the rate of tooth movement.<sup>[5]</sup> Osteoclasts are primarily observed 2 days after force application. We noticed a lower number of osteoclasts in a pregnant woman 2 days after appliance insertion. This decrease in osteoclast number may be due to the gradual increase of estrogen and progesterone at early phases of pregnancy. It has been suggested that maximum osteoclasts recruitment happens 5-7 days after force application.

### Estrogens

Estrogens are female sex hormones that occur naturally in three forms. The first and most prominent form of estrogen is estradiol, which is produced from menarche to menopause and is important in the regulation of the estrous cycle. The second form is estrone, produced after menopause, when the total amount of estrogens has decreased. The third form, estriole, is expressed primarily during pregnancy. Only two investigations are available on the effect of estrogens on OTM. One study focused on the rate of buccal movement of molars evoked by a force of 12.5 cN during the normal estrous cycle in rats. It was found that the rate of OTM was inversely related to the estrogen serum level.<sup>[6]</sup> The second study looked into the effect of ovariectomy on buccal movement of rat molars evoked by a force of 10 cN. A significant increase in the rate of OTM was established.<sup>[7]</sup>

### Relaxin

Relaxin has been known for decades as a pregnancy hormone. It is released just before childbirth to loosen the pubic symphysis and hence that the relaxed suture will allow widening of the birth canal for parturition. It has also been shown to have effects on a multitude of other physiological processes, including the regulation of vasotonus, plasma osmolality, angiogenesis, collagen turnover and renal function.<sup>[8]</sup> Relaxin's influence on soft-tissue remodeling and on several mediators that stimulate osteoclast formation have attracted attention from orthodontic researchers. Liu *et al.* showed that the administration of human relaxin might accelerate the early stages of OTM in rats.<sup>[9]</sup> Stewart *et al.* used gingival injections of relaxin in dogs to relieve rotational memory in the connective tissues of maxillary second incisors that had been orthodontically rotated.<sup>[10]</sup> The results were not significant, but the authors suggested that a refinement of dosages and treatment techniques might improve the response in future studies. Nicozisis *et al.* demonstrated that the presence of relaxin abolished the integrity of sutures *in vitro*.<sup>[11]</sup> These authors suggested

that 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; or for orthopedic expansion in non-growing patients, by reducing the tension of the stretched soft-tissue envelope, particularly the expanded palatal mucosa, after orthognathic surgery, whether these findings will hold true in clinical practice remains to be investigated.

### Patient Education and Awareness

It is important that medical professionals dealing with prenatal care be educated the importance of dental care to their patients. In addition, the dental health-care providers must be aware of the importance of dental care during pregnancy and effects of poor periodontal health on pregnancy and the baby. Various behavioral modification techniques could be employed. Constant motivation of the patient could help improve patient compliance during orthodontic treatment. 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 [Flow Chart 1].

### Oral Hygiene Maintenance During Orthodontic Treatment

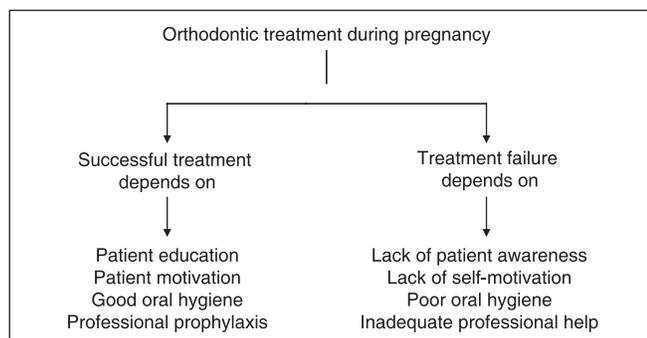
Before starting orthodontic treatment, any preexisting periodontal condition must be addressed. Because of pre-existing hormonal changes during pregnancy, the gingival tissues may be already inflamed in pregnant women. Thus, a more rigorous oral hygiene routine will be required to maintain optimal oral health. Frequent dental prophylaxis will be helpful and meticulous homecare 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 inter-dental cleaning aids such as toothpicks or miniature bottle brushes can be attached to handles for the convenience of manipulation around teeth, 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.<sup>[12,13]</sup>

### Role of professionals

For successful completion of orthodontic treatment, a good communication must be established between the patient and the orthodontist from the beginning. Detailed history, oral examination and assessment of patient compliance and expectations will enable the orthodontist to develop practical goals for successful treatment. It is important for orthodontists to be aware of the limitations that may be inherent in such cases. In addition to reinforcing oral hygiene, it is important that the patient be sent for professional cleaning at regular intervals. Good communication among health-care professionals will benefit the patient and improve their quality-of-life. We should use steel ligature in place of elastic modules because elastic modules are less hygienic.

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 pregnancy. Radiographic imaging such as a panoramic film and peri-apical films are routinely used to assess periodontal health and root inclinations. Every precaution should be taken to minimize radiation during pregnancy. However, if there is an acute dental infection, it must be addressed and radiographs can be taken. In addition, the radiation caused by oral radiography is minimal. It is advisable to coordinate the orthodontic treatment plan with the obstetric care provider to establish guidelines that will benefit maternal oral health and perinatal outcomes [Table 1].



**Flow Chart 1:** Factors for success and/or failure of orthodontic treatment during pregnancy

**Table 1: Important points to be considered during orthodontic treatment in pregnancy**

Get the opinion of the gynecologist
Avoid excessive radiographs (avoid radiation)
Avoid excessive medication
Appointment must be of short duration
Use steel ligature in place of elastic modules
Avoid complex biomechanics
Advice inter-dental cleaning aids
Regular motivation about oral hygiene

### Role of patients

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/or periodontal issues during the course of their orthodontic treatment.

## Conclusion

Orthodontic treatment during pregnancy may aggravate gingivitis caused by local and systemic factors. Periodontitis during pregnancy may lead to complications and preterm low-birth-weight babies. Awareness among oral and prenatal health-care professionals is critical for optimal patient care. Our emphasis is on patient education, oral hygiene maintenance and preventive and treatment strategies for the management of gingival health in orthodontic patients during pregnancy. Pregnancy may reduce OTM and subsequently increase treatment period, but patients should not be worried about get in trouble during pregnancy and orthodontic treatment, because the duration of orthodontic treatment is often more than pregnancy period.

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