

## Original Article

### Correlation between Orthodontic Treatment and Periodontitis- A Clinical Study

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#### ABSTRACT:

**Background:** Orthodontic treatment may inhibit complete oral hygiene procedures and create the possibility of transition of the subgingival plaque to a more aggressive periopathogenic flora. This study was conducted to establish the correlation between orthodontic tooth movement and periodontitis. **Materials & Method:** This study was conducted on 160 patients who underwent orthodontic treatment for malocclusion. They were divided into two groups. Group I patients were treated with fixed orthodontics while group II patients received myofunctional appliances. **Results:** Out of 160 patients, males were 60 and females were 100. The difference was significant (P- 0.02). The value for plaque, gingival recession and tooth mobility significantly increased in group I patients. However the difference was statistical non- significant in group II patients. **Conclusion:** There is correlation between malocclusion and periodontitis. Hence maintenance of oral hygiene is very essential in patients with malocclusion and this has to be maintained before undergoing orthodontic treatment.

**Key words:** Malocclusion, Orthodontic, Myofunctional appliances.

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#### INTRODUCTION

Malocclusion leads to poor periodontal health. Orthodontic treatment may inhibit complete oral hygiene procedures and create the possibility of transition of the subgingival plaque to a more aggressive periopathogenic flora. If a thorough oral hygiene regime is applied before and during orthodontic treatment, minimal or no increase in gingival bleeding index or a plaque quantity will be evident. After appliance removal, there is a significant improvement in plaque index and bleeding index.<sup>1</sup>

Orthodontic treatment aim at providing an acceptable functional and esthetic occlusion and improvement in the masticatory function. By treating malocclusion and reducing occlusion trauma, a better periodontal health is achieved. So, it has been suggested that orthodontic treatment leads to an improved periodontal status. Maligned teeth are difficult to clean as compared to well aligned teeth. Orthodontic treatment poses difficulty in complete oral hygiene procedures and as a result promotes conversion of subgingival plaque to a more aggressive periopathogenic

flora. Also, there is accumulation of plaque around the orthodontic appliances such as brackets and wires resulting in gingivitis and periodontitis.<sup>2</sup>

Authors have found strong correlations between malocclusions and periodontal condition and concluded that malocclusion is risk factor for periodontal disease. It has been suggested that orthodontic appliances contribute to chronic infection, inflammatory hyperplasia, irreversible loss of attachment and gingival recession. Few studies have shown that labial movement of the mandibular incisors during orthodontic treatment leads to gingival recession while others have found no such association between orthodontic tooth movement and gingival recession.<sup>3</sup> With adequate plaque control, patients with reduced but healthy periodontium can undergo orthodontic treatment without aggravating their periodontal conditions. However, when inflammation is not fully controlled, orthodontic treatment may trigger inflammatory processes and accelerate the progression of periodontal destruction leading to further loss of attachment, even in patients with sound

oral hygiene. Specific long-term clinical and radiographic findings support the fact that periodontal disease develops in regions where orthodontic bands are placed and leads to statistically significant loss of attachment. The present study was conducted to establish the correlation between orthodontic tooth movement and periodontitis.

**MATERIALS & METHOD**

The present study was conducted on 160 patients of both genders and were divided into two group: Group I patients were treated with fixed orthodontic treatment while group II patients received myofunctional appliances. Only those patients, whose pre- and post-treatment records and patients with pre- and post-treatment clinical intra-oral photographs were available, were included in the study. All were

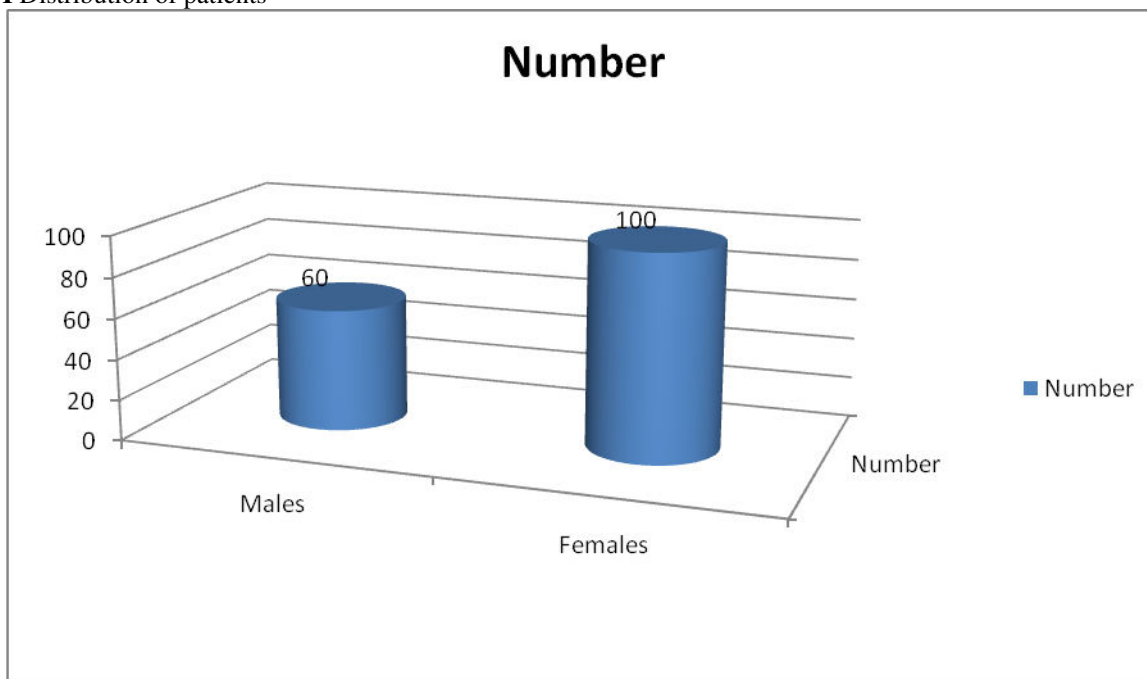
informed regarding the study and informed written consent was obtained. Ethical clearance was taken from institutional ethical committee.

General information such as name, age, gender etc. was noted in case history performa.

Following parameters were taken into consideration such as presence or absence of plaque preoperatively and postoperatively, presence or absence of labial gingival recession before and after orthodontic treatment and comparison of tooth mobility preoperatively and postoperatively. Both photographs and panoramic radiographs were analyzed by experienced operator. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered statistical significant.

**RESULTS**

**Graph I** Distribution of patients



Graph I shows that out of 160 patients, males were 60 and females were 100. The difference was significant (P- 0.02).

**Table II** Distribution of patients according to orthodontic treatment

		Male	Female
<b>Fixed orthodontics (group I)</b>	Class I	10	35
	Class II	6	20
	Class III	9	15
<b>Myofunctional orthodontics (group II)</b>	Class I	15	12
	Class II	12	14
	Class III	8	4

Table II shows that out of 160 patients, 90 patients received fixed orthodontics (Group I) (male - 25, female- 70) and 70 patients (males- 35, females- 30) received myofunctional appliances (Group II). In group I, class I included 10 males and 35 females, class II (males- 6, females- 20, class III (males-9, females- 15). Group II had 15 males and 12 females in class I, 12 males and 14 females in class II and 8 males and 4 females in class III.

**Table III** Distribution of plaque, gingival recession and tooth mobility in both groups

Parameter	Fixed orthodontics (group I)		P value	Myofunctional orthodontics (group II)		P value
	Before treatment	After treatment		Before treatment	After treatment	
<b>Plaque Mean± S.D</b>	3.3±6.6	5.7±9.8	0.01	2.6±6.3	3.3±6.7	0.3
<b>Gingival recession Mean± S.D</b>	0.17±1.22	0.57±1.48	0.00	0.11±1.10	0.18±1.31	0.1
<b>Tooth mobility mean± S.D</b>	0.15±1.87	0.53±1.89	0.00	0.12±1.41	0.15±1.53	0.2

Table III shows that patients who underwent fixed orthodontics (Group I), their plaque index value (3.3±6.6 to 5.7±9.8) was significantly increased (p value- 0.01). However, there was non significant increase (p value- 0.3) in plaque index value (2.6±6.3 to 3.3±6.7) in patients who received myofunctional appliances (Group II). The gingival recession values (0.17±1.22 to 0.57±1.48) also showed significant increase (p value- 0.00) in patients treated with fixed orthodontics. In group II, gingival recession value (0.11±1.10 to 0.18±1.31) showed non significant increase. The tooth mobility values increased (0.15±1.87 to 0.53±1.89) in group I patients and those who were treated with myofunctional appliances, their values were also increased (0.12±1.41 to 0.15±1.53).

**DISCUSSION**

A strong relationship between the abnormal positions of the teeth in the dental arch and the periodontal disorders had been previously described. Moreover, it has been shown that the number of periodontal pathogens in the anterior sites of crowded teeth is much greater than that in the sites of aligned teeth. Patients undergoing orthodontic treatment due to brackets and wires provides favourable environment for plaque accumulation. Hence it is very important to maintain oral hygiene in patients undergoing orthodontic treatment.<sup>4</sup>

In present study, out of 160 patients, males were 60 and females were 100. We evaluated the presence of plaque, gingival recession and grading of tooth mobility through the patients records like pre-operative photographs and panoramic radiographs which were compared with postoperative records. All types of malocclusion such as class I, class II and class III were included in the study. Patients received either fixed orthodontics or myofunctional appliances. Out of 160 patients, 90 patients received fixed orthodontics (Group I) (male - 25, female- 70) and 70 patients (males- 35, females- 30) received myofunctional

appliances (Group II). In group I, class I included 10 males and 35 females, class (males- 6, females- 20, class III (males-9, females- 15). Group II had 15 males and 12 females in class I, 12 males and 14 females in class II and 8 males and 4 females in class III. Our results are in agreement with Hollender et al.<sup>5</sup>

We evaluated plaque index, gingival recession and tooth mobility values in patients receiving fixed and myofunctional orthodontics. Patients who underwent fixed orthodontics (Group I), their plaque value (3.3±6.6 to 5.7±9.8) was significantly increased (p value- 0.01). However, there was non significant increase (p value- 0.3) in plaque value (2.6±6.3 to 3.3±6.7) in patients who received myofunctional appliances (Group II).

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Type of orthodontic treatment plays important role in developing periodontitis. Removable appliances place intermittent tipping forces on teeth but fixed appliances can create continuous multidirectional forces. Thus heavy forces causes bone resorption at the side of pressure.

The gingival recession was mostly seen in upper and lower anterior teeth.<sup>7</sup> Because most of the orthodontic tooth movement was achieved in these two regions. Gingival recession was evaluated using Miller classification. Doffman<sup>8</sup> in his study suggested that gingival recession is mostly seen in more proclined teeth as compared to less proclined teeth. Thus for orthodontic treatment in patients with periodontitis, the clinical attachment level, tooth

mobility, and the inclination of incisors should be considered.

## CONCLUSION

There is correlation between malocclusion and periodontitis. Hence maintenance of oral hygiene is very essential in patients with malocclusion and this has to be maintained before undergoing orthodontic treatment.

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