

## Original Research

### Evaluation of impact of fixed orthodontic treatment on gingival health

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#### ABSTRACT:

**Background:** Orthodontic treatment ensures proper alignment of the teeth and improves the occlusal and jaw relationship. Hence; the present study was undertaken for assessing the effect of fixed orthodontic treatment on gingival health. **Materials & methods:** A total of 200 patients who were scheduled orthodontic treatment were enrolled. Complete data records of all the patients were recorded. Intra-oral and extra-oral radiographs were obtained and photographic records were noted in separate Performa. Complete intra-oral examination of all the subjects was carried out for recording visible plaque, any inflammation (visible clinically) and gingival recession. Follow-up records were assessed. Analysis of all the results was done by SPSS software. **Results:** A total of 200 patients were enrolled. Out of 200 patients, dental extractions were carried in 100 patients while the remaining 100 cases were treated without dental extractions. Mean age of the patients with and without dental extractions was 16.3 years and 15.4 years respectively. Visible plaque value before and after treatment was 3.26 and 5.28 respectively. Visible inflammation scores before and after treatment was 2.31 and 14.15 respectively. Gingival recession score before and after treatment was 0.29 and 0.41 respectively. Significant results were obtained while comparing the plaque, inflammation and gingival recession scores before and after treatment. **Conclusion:** From the above results, the authors concluded that significant increase in plaque accumulation, inflammation and gingival recession occurs following fixed orthodontic treatment.

**Key words:** Gingival, Orthodontic treatment, Plaque

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#### INTRODUCTION

Orthodontic treatment ensures proper alignment of the teeth and improves the occlusal and jaw relationship. This not only aids in better mastication, speech, and facial aesthetics, but also contributes to general and oral health, thereby improving the quality of life. Like any other treatment modalities, orthodontic treatment, in addition to its benefits, has also associated risks and complications. However, the risk and complication associated with treatment are reported to be considerably lower compared to other surgical or nonsurgical interventions.<sup>1-3</sup>

However, the most commonly reported adverse effects of orthodontic treatment can be both local and

systemic. It has been shown that orthodontic forces represent a physical agent capable of inducing an inflammatory reaction in the periodontium. This reaction is necessary for orthodontic tooth movement. One of the challenges of orthodontics is to finish the orthodontic treatment with the least effects on the root and periodontium.<sup>4-6</sup> Hence; the present study was undertaken for assessing the effect of fixed orthodontic treatment on gingival health.

#### MATERIALS & METHODS

The present research was planned with the aim of assessing the impact of fixed orthodontic treatment on

gingival health. A total of 200 patients who were scheduled orthodontic treatment were enrolled. Complete data records of all the patients were recorded. Intra-oral and extra-oral radiographs were obtained and photographic records were noted in separate Performa. Complete intra-oral examination of all the subjects was carried out for recording visible plaque, any inflammation (visible clinically) and gingival recession. Follow-up records were assessed. Analysis of all the results was done by SPSS software.

## RESULTS

A total of 200 patients were enrolled. Out of 200 patients, dental extractions were carried in 100 patients while the remaining 100 cases were treated without dental extractions. Mean age of the patients with and without dental extractions was 16.3 years and 15.4 years respectively. Visible plaque value before and after treatment was 3.26 and 5.28 respectively. Visible inflammation scores before and after treatment was 2.31 and 14.15 respectively. Gingival recession score before and after treatment was 0.29 and 0.41 respectively. Significant results were obtained while comparing the plaque, inflammation and gingival recession scores before and after treatment.

**Table 1:** Demographic data

Parameter	Fixed orthodontic treatment (n=200)	
	With dental extraction (n=100)	Without dental extraction (n=100)
Mean age (years)	16.3	15.4
Gender	Males	41
	Females	59
Mean treatment time (months)	28.1	27.8

**Table 2:** Comparison of plaque, inflammation and gingival recession values

Variable	Fixed orthodontic treatment	p-value
Visible plaque value	Before treatment	3.26
	After treatment	5.28
Visible inflammation value	Before treatment	2.31
	After treatment	14.15
Gingival recession score	Before treatment	0.29
	After treatment	0.41

\*: Significant

## DISCUSSION

Orthodontic treatment and the procedures are known to induce both positive and negative local soft-tissue reactions in the gingiva. The negative reaction is

mainly associated with gingivitis. The presence of plaque is considered as one of the main factors in the development of gingivitis. Orthodontic brackets and elastics might interfere with effective removal of dental plaque, thereby increasing the risk of gingivitis. Few clinical studies also reported poor periodontal health and greater loss of clinical attachment level distally in the dental arches. This could be a result of poor oral hygiene in molar regions and the presence of molar bands, which favors food lodgment. However, as a result of the orthodontic treatment a shift in the composition and type of bacteria can be expected. Orthodontic treatment is known to affect the equilibrium of oral microflora by increasing bacteria retention. In a study, an increase in the value of periodontal indices and growth of periodontopathogenic bacteria were observed in adolescent patients undergoing fixed orthodontic treatment. In the majority of the patients, following placement of a fixed appliance, small amount gingival inflammation is visible, which could be transient in nature and does not lead to attachment loss.<sup>7-10</sup> Hence; the present study was undertaken for assessing the effect of fixed orthodontic treatment on gingival health.

In the present study, a total of 200 patients were enrolled. Out of 200 patients, dental extractions were carried in 100 patients while the remaining 100 cases were treated without dental extractions. Mean age of the patients with and without dental extractions was 16.3 years and 15.4 years respectively. Visible plaque value before and after treatment was 3.26 and 5.28 respectively. Liran Levin et al evaluated the association of orthodontic treatment and fixed retainers with gingival health. The study included 92 consecutive subjects who arrived for routine dental examination at a military dental clinic between May and August 2007. Plaque and gingival indices, gingival recession, probing depth, and bleeding on probing were measured at the anterior sextants. The mean probing depth was 1.90 +/- 0.2 mm, and gingival recession was 0.06 +/- 0.02 mm; 20.8% of all sites exhibited bleeding on probing. Current smoking was reported by 20 (21.7%) patients. Labial gingival recession was significantly greater in treated (0.13 +/- 0.2 mm) patients compared to non-treated patients (0.05 +/- 0.2 mm; P = 0.03). Localized lingual gingival recession was significantly greater in teeth with fixed retainers (0.09 +/- 0.2 mm) compared to teeth with no fixed retainers (0.01 +/- 0.1 mm; P = 0.0002), as were plaque and gingival indices and bleeding on probing. Plaque on the lingual/palatal aspect showed a weak, positive correlation with lingual gingival recession (r = 0.16; P = 0.033). Orthodontic treatment and fixed retainers were associated with an increased incidence of gingival recession, increased plaque retention, and increased bleeding on probing; however, the magnitude of the difference in recession was of low clinical significance.<sup>11</sup>

In the present study, visible inflammation scores before and after treatment was 2.31 and 14.15 respectively. Gingival recession score before and after treatment was 0.29 and 0.41 respectively. Significant results were obtained while comparing the plaque, inflammation and gingival recession scores before and after treatment. Fatma Boke et al evaluated the relationship between orthodontic treatment and gingival health. A total of 251 patients among whom 177 were girls and 74 were boys, recruited from the records pool of the Department of Orthodontics, Faculty of Dentistry, University of Gazi, were included in the study. Patients' treatments have been completed by postgraduate students during the period between 2006 and 2012. Patients' folders were analyzed according to their age, treatment time, and the type of orthodontic treatment. Intra-oral photographs were analyzed, and the presence or absence of visible plaque, visible inflammation, and gingival recession were recorded, and incisor inclinations analyzed on lateral cephalometric films, before and after orthodontic treatment. No statistically significant difference was found in patients treated with functional appliances before and after treatment. In patients treated with fixed orthodontic appliances, visible plaque, visible inflammation, and gingival recession showed significant increases after treatment, gingival biotype did not show any significant difference. Positive correlation was found between lower incisor position and gingival recession in patients treated with fixed appliance and extraction. And also cuspids were the teeth with the highest prevalence of gingival recession. Considering the relationship between orthodontic treatment and gingival health, cooperation among patients, orthodontists, and periodontists is important.<sup>11</sup>

## CONCLUSION

From the above results, the authors concluded that significant increase in plaque accumulation, inflammation and gingival recession occurs following fixed orthodontic treatment.

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