

Comparison of duration of orthodontic treatment with and without extraction among orthodontic patients

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Abstract

Objective: To compare the effectiveness and duration of orthodontic treatment between Nepalese orthodontic patients with extraction and with non-extraction treatment basis.

Materials and methods: A total of two hundred orthodontic patients with proportional number of patients treated on extraction and non-extraction basis were evaluated from two exclusive orthodontic practice centers. All patients were treated with Straight Wire brackets. Transferred patients and previous orthodontically treated patients were excluded from the study.

Result: The average duration of orthodontic treatment was 28.5 months for all orthodontic patients with no statistical difference between the extraction and non-extraction groups. The study however found that the treatment for those with extraction cases were more likely to take longer duration clinically than the non-extraction cases.

Key words: Duration, Extraction, Non-extraction

Introduction

The extraction versus non-extraction debate is one of the earliest and most lasting philosophic controversies of orthodontic practice with both biologic and mechanical ramifications¹⁻³. In clinical practice many orthodontic patients are obviously concerned about the duration of time that they will be required to wear fixed orthodontic appliances. Estimates of treatment duration would also be useful to clinicians for efficient office management. Treatment duration is affected by several variables⁴ such as treatment basis (extraction vs. non-extraction), sex (male vs. female), age group (adolescent vs. adult), and malocclusion type. Furthermore, other variables like missing appointments, breakage of appliance, patient co-operation (i.e. wearing of elastic, bite plate etc.), number of dental arches treated, number of treatment phases etc. may also contribute to longer duration of orthodontic treatment. Most of the authors believe that the duration of orthodontic treatment mainly depend on patient co-operation⁵⁻⁷.

The objective of the present study was to compare and evaluate how the extraction versus non-extraction

treatment basis affect the duration of orthodontic treatment among Nepalese orthodontic patients.

Materials and methods

Orthodontic records were obtained from two exclusive orthodontic practice centers with subjects treated with Straight Wire appliance. A total of 200 patients comprising of 101 patients treated with extraction basis and 99 patients treated with non-extraction basis were analyzed for the study. 80 patient records were collected from Department of Orthodontics, People's Dental College and Hospital (PDCH), Kathmandu, and 120 from The Orthodontic Center (TOC), Kathmandu. Consecutively treated cases starting from June 15, 2002 and completing by June 15, 2007 were evaluated.

The start of treatment was defined as the date of first arch wire placement and completion of treatment as the date on which fixed appliances were debonded completely. Only those cases with complete pre-treatment and post-treatment records comprising of study models and written treatment records were included. Transferred cases, two

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phase treatment protocol patients, single arch treated patients and previous orthodontically treated patients were excluded from the study. All treatment duration were converted to nearest of months.

All subjects were treated with Straight Wire appliance with Roth prescription of tip and torque. All bracket slots were 0.018 and brackets were placed at right angles to the long axes of the teeth. Round, square and rectangular arch wires were used as required; and elastics, headgear, 'T' loops, 'L' loops and key-hole loops were used routinely.

All data were fed into SPSS software (version 12). The independent t-test was performed to compare the difference between the extraction and non-extraction treatment basis. The level of significance was set at 0.05.

Result

The result of the present study is shown in Table 1. The study shows that the mean duration of orthodontic treatment with extraction is 31.4 months and with non-extraction is 25.5 months respectively. The mean duration of orthodontic treatment for all orthodontic patients was 28.5 months with no statistical difference between the extraction and non-extraction groups. The study however found that the treatment for those with extraction cases were more likely to take longer duration clinically than the non-extraction cases.

Table 1: Treatment duration according to treatment basis (in months)

Extraction	Non-extraction	Average	p-value	Significance
31.4	25.5	28.5	.081	NS

(NS: not significant)

Discussion

The average duration of treatment among Nepalese orthodontic patients according to present study is 28.5 months. The result is shorter than the report given by Vig et al⁴, which reported a mean duration of 31 months; and longer than the report of Alger⁸ which reported a mean of 22 months.

Most of the authors believe that there is association between increase in duration of treatment and extraction of tooth for treatment purpose. It is so because those patients whose treatment procedures involve tooth extractions generally possess much severe malocclusion compared to those treated on non-extraction basis⁹.

Table 1 shows average treatment duration of 25.5 months for non-extraction cases and 31.4 months for extraction cases with a difference of 5.9 months. Though there is

obvious clinical difference of 5.9 months between the extraction and non-extraction cases, there is however no statistical difference between them. The result shows that the obtained p-value of 0.08 is very near to the level of significance (0.05).

The present data is supported by Chua et al¹⁰ whose mean treatment duration for the extraction group was 33.9 months, which is longer than that of non-extraction group (25.6 months). The present data is also supported by Fink et al¹¹ who found the extraction duration is longer than the non-extraction duration. It is interesting to note their finding that each premolar extraction adds 0.9 months of duration or 1.8 months for two premolar extraction case and 3.6 months for a case with four premolars extraction. Another interesting finding by him is that every degree increase in mandibular plane decrease the 0.3 months of duration of orthodontic treatment. In contrast to present finding, Vig et al⁴ found that the duration of extraction case is slightly shorter (31.2 months) than the non-extraction cases (31.3 months).

Summary and conclusion

The average duration of orthodontic treatment was 28.5 months for all orthodontic patients with no statistical difference between the extraction and non-extraction groups. Differences in duration of treatment were apparent clinically when extraction and non-extraction patients were compared. Treatment for those who had tooth extractions were more likely to take longer period of time.

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