

Pain and Discomfort during Orthodontic Treatment

Sagar Kausal^{1,*}, Aditya Agrawal², Uday N. Soni³, N.G. Toshniwal⁴, Abhijit Misal⁵

^{1,3}PG Student, ²Private Practitioner, ⁴HOD, ⁵Professor, Department of Orthodontics, Rural Dental College, Pravara Institute of Medical Sciences, Loni, Maharashtra

***Corresponding Author:**

Email: dr.sagarkausal@gmail.com

Abstract

Orthodontic treatment is often related with pain and discomfort. There has been extensive research done to analyze the pain its nature and its effect on the patients. In the present study, we make an effort to assess the pain and its effect such as behavioral changes and dietary changes during orthodontic treatment. In the present study, we would like to assess the severity of pain that the patients experiences during different stages of orthodontic treatment and their behavioral changes during treatment and also the change in their dietary habits.

Key Word: Pain, Orthodontic treatment, Patient's compliance

Introduction

Patients undergoing orthodontic treatment quite often complain about pain and discomfort during various stages of orthodontic treatment. Discomfort is expressed as unpleasant tactile sensations, feeling of constraint in the oral cavity, stretching of the soft tissues, pressure on the mucosa, displacement of the tongue, soreness of teeth and pain.⁽¹⁻⁴⁾ It is well documented in literature that pain and discomfort are potential side-effects of orthodontic treatment (KVAM⁽⁵⁾ et al 1989, and SCHEURER⁽⁶⁾ et al 1996). OLIVER and KNAPMAN⁽⁷⁾ in 1985 stated that pain and discomfort may have negative influence on the patients desire to undergo orthodontic treatment and it may also affect the treatment outcome and compliance of the patient.

A study performed by KLUEMPER in 2002⁽⁸⁾ suggested that pain is one of the key factor that deterrent the orthodontic therapy and a major reason for discontinuing the treatment. Most of the patients undergoing fixed appliance treatment complain about pain, discomfort, oral ulceration, tongue soreness and functional limitations (BERGIUS et al, 2000)⁽⁹⁾.

In orthodontics, many studies have been performed to understand the nature of pain and discomfort associated with orthodontic treatment, and also the psychological effects during treatment. In the present study, we would like to assess the severity of pain that the patients experiences during different stages of orthodontic treatment and their behavioral changes during

treatment and also the change in their dietary habits.

Material and Method

The study was conducted on a sample size of 200 patients who reported the orthodontics department in Rural Dental College and received orthodontic treatment. A questionnaire was given to be filled up by the patient himself with the help of consulting orthodontist.

The questionnaire was as follows:

ORTHODONTIC PAIN MANAGEMENT PATIENT QUESTIONNAIRE

Pravara Institute of Medical Sciences, Rural Dental College, Loni
Department Of Orthodontics

Patient Questionnaire

A) Informed consent of patient-

I _____, am willing to submit my personal & treatment details and the information given is correct up to my knowledge.

1) Patient's name-
 2) Age-
 3) Sex -
 4) Chief complaint-

SIGNATURE OF PATIENT _____

NOTE: - Please tick {✓} on your choice of answers of the following question.

B) Questions on pain

1) According to you, during which procedure you experienced the worst pain?

a) separators and bonding b) Anchorage preparation
 c) Initial wire d) Retraction

Page 1

ORTHODONTIC PAIN MANAGEMENT PATIENT QUESTIONNAIRE

2) In which region did you experience pain?
 a) Around teeth b) In oral mucosa
 c) In TMJ area

3) What was the timing of onset of pain?
 a) Day b) Night
 c) Mastication d) Speech

4) How much time did the pain last?
 a) Minutes b) Hours
 c) Whole day d) Whole night

5) What was the type of pain?
 a) Continuous dull b) Continuous throbbing
 c) Acute but dull in nature d) Acute but throbbing in nature

6) What were the subsiding factors for pain?
 a) Medication (systemic) b) Topical anesthesia
 c) Time (no treatment)

7) Effects of pain on-
 a) Daily routine – Yes/ No
 b) Food habit – Yes / No
 c) Change in social behavior –Yes / No
 d) Change in psychological temperament of patient –Yes / No

Page 2

ORTHODONTIC PAIN MANAGEMENT PATIENT QUESTIONNAIRE

C) Questions on discomfort:-

1) Did the braces affect your social appearance?
 → _____

2) Was discomfort accompanied with pain?
 → _____

3) Did the braces affect your daily routine?
 → _____

4) Did the braces cause physiological discomfort to you?
 → _____

5) Did after putting up braces, the patient show a change in behavior?
 → _____

6) After braces, what was the change in food habits of yours?
 → _____

7) What were the effects of the treatment on the behavior of the patient towards the family?
 → _____

Page 3

ORTHODONTIC PAIN MANAGEMENT PATIENT QUESTIONNAIRE

D) Measuring the degree or extent of pain –

Following are some Orthodontic procedures, rate the extent of pain you experienced during the procedure, 0-standing for no pain to 10-standing for severe or worst pain. Please rate every procedure.

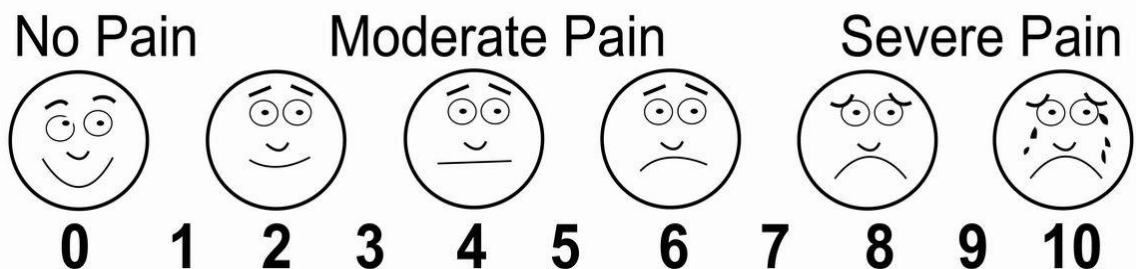
No Pain Moderate Pain Severe Pain

0 1 2 3 4 5 6 7 8 9 10

> On Separator placement - ____
 > On Banding - ____
 > On Bonding - ____
 > On Initial wire placed - ____
 > On Retraction phase - ____
 > On Debonding - ____

Page 4

The Visual Analogue Scale was used to assess the pain during various stages of orthodontic treatment. The patients was asked to rate the pain from 0 to 10, 0 being the no pain and 10 being highest degree of pain.



Statistical Analysis: Data was analyzed by descriptive statistics as mean, SD (standard deviation), percentage and proportion. Results were analyzed by applying Z- test of difference between two proportions and chi- square test was applied at 5% and 1% level of significance. Statistics analysis software namely –SYSTAT Version -12 was used.

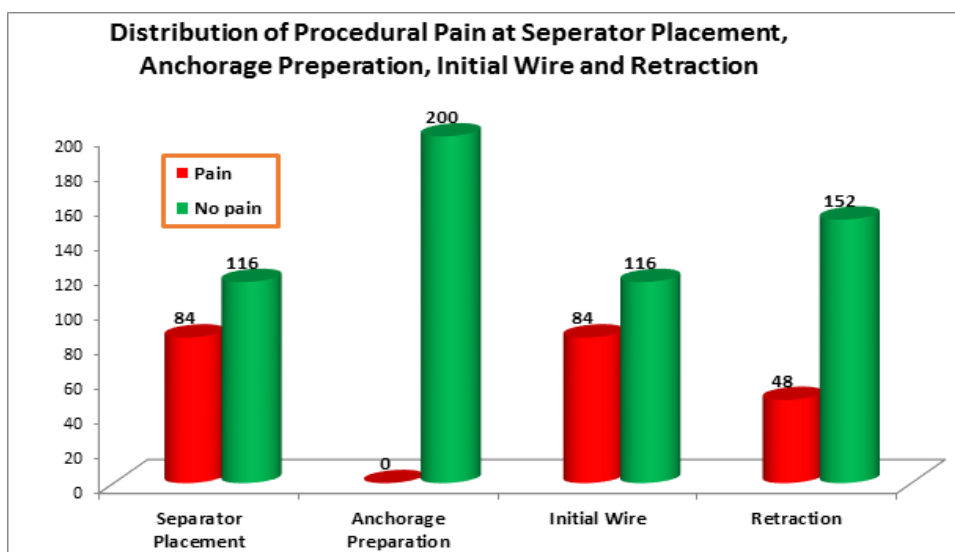
Results

The results obtained after data analysis was divided under following headings:

A: Distribution of procedural Pain on Separator Placement, Anchorage preparation, initial wire and retraction

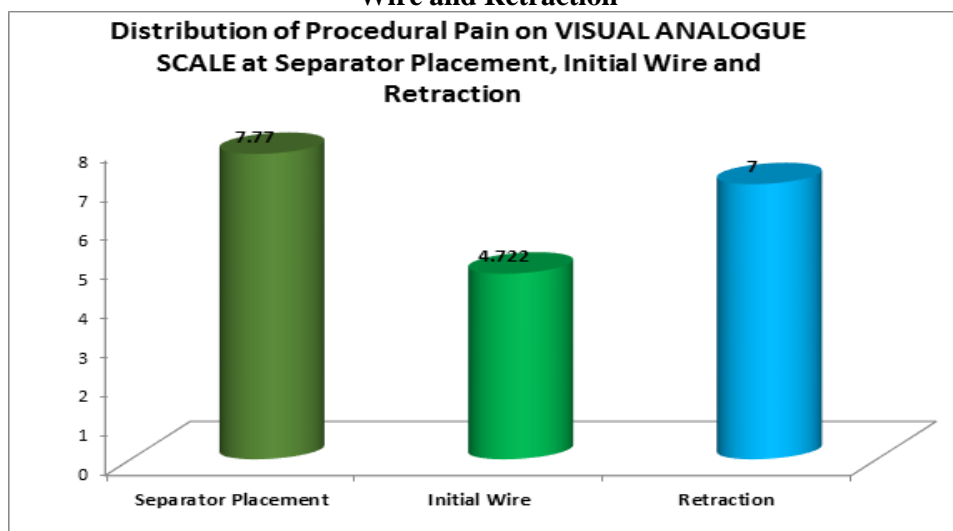
Orthodontic Procedure	Pain	No pain
	No. (%)	No. (%)
Separator Placement	84(42%)	116(58%)
Anchorage Preparation	0	200(100%)
Initial Wire	84(42%)	116(58%)
Retraction	48(24%)	152(76%)

- Value of $\chi^2 = 120.55$, $p < 0.001$, highly significant.
- By applying Chi-Square test there is a highly significant association between pain and separator placement, Anchorage preparation, Initial wire and Retraction of procedural pain ($p < 0.001$).
- Also, it is seen that maximum pain is seen at separator placement (42%) and at initial wire (42%), while retraction (24%) showed minimum pain and anchorage preparation does not have any pain.



B: Distribution of Procedural Pain on Visual Analogue Scale on Separator Placement, Initial Wire and Retraction

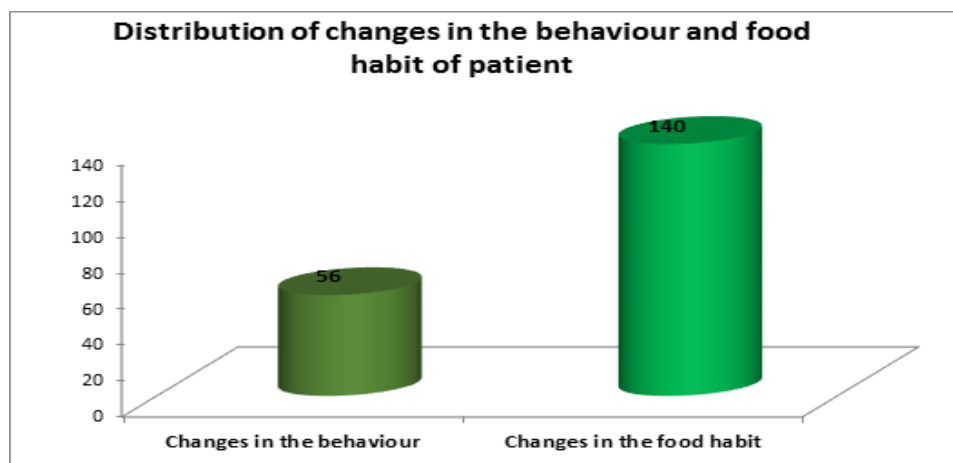
Orthodontic Procedure	Visual analogue scale
	Mean \pm SD
Separator Placement	7.77 \pm 1.13
Initial Wire	4.722 \pm 1.24
Retraction	7.0 \pm 1.06

Table 2: Distribution of Procedural Pain on Visual Analogue Scale on Separator Placement, Initial Wire and Retraction**C: Distribution of changes in the behavior and food habit of patient**

	Yes	No
	No. (%)	No. (%)
Changes in the behaviour	56(28%)	144(72%)
Changes in the food habit	140(70%)	60(30%)

Table 3: Distribution of changes in the behavior and food habit of patient:

- Value of $\chi^2 = 68.918$, $p < 0.001$, highly significant.
- By applying Chi-Square test there is a highly significant association between changes in behavior and food habits of the patients ($p < 0.001$).
- Also, it is seen that maximum changes are seen in changes in the food habit (70%) as compared to behavioral changes (28%).

**D: Distribution of Nature of pain**

Type of Pain	Pain	No pain
	No. (%)	No. (%)
Continuous Dull	92(46%)	108(54%)
Continuous Throbbing	8(4%)	198(96%)
Occasional Dull	66(33%)	134(67%)
Acute Throbbing	0	200(100%)

Table 4: Distribution of Nature of pain

- Value of $\chi^2 = 184.8$, $p < 0.001$, highly significant.
- By applying Chi-Square test there is a highly significant association between nature of pain of the patients ($p < 0.001$).
- Also, it is seen that maximum pain are seen in continuous dull (46%), followed by in occasional dull (33%), continuous throbbing, and no pain seen in acute throbbing.

Discussion

The above results were completely based upon the experiences of the patients they described in the questionnaire. The VAS scale was used to measure the degree the pain, because the concept of VAS scale is easy to understand and easy for the patients to respond (SEYMOUR et al 1985⁽¹⁰⁾, Huskisson 1983⁽¹¹⁾).

a) **Procedural Pain:** Based upon the answers obtained from the questionnaire, 84 patients (42%) out of 200 patient's screened, experienced pain after separator placement and 84 patients (42%) out of 200 patients after initial wire insertion.

- Separators caused pain of moderate intensity in the region of first molar on mastication and mild dull pain on rest. NAGAN et al⁽²⁾ evaluated pain due to separator placement and they concluded that patients experienced pain from 4 to 24 hours after separator placement and it gradually reduced as time elapsed.
- After insertion of initial wire patients reported pain peaks in 24 hours, the same results were given by JONES and CHAN in 1992⁽¹²⁾, NAGAN et al⁽²⁾ in 1989. Jones and Chan also reported a trend towards pain intensity reduction, occurring due to progressive adaptation of the patients to orthodontic appliances.

b) **Changes in the behavior of the patient:** As per the response of 72% patients reported no change in their daily behavior.

c) **Changes in the food habit or dietary intake:** Around 70% of the patients reported a change in their food habit. Majority of the patients reported difficulty in chewing and hence preferred a soft consistency food. Similar kinds of results were reported by Brown⁽¹³⁾ and Moerenhout in 1991.

Many orthodontists while giving dietary instructions tell their patients to avoid sticky food like chocolate and chips which stick to the appliance and worsen the oral hygiene and avoid consumption of hard food stuff in order to reduce chances of debonding of single brackets.

It's an interesting finding that the dietary changes was a result of pain and discomfort the patient experienced during orthodontic treatment and the change was regarded as positive because the patients adopted a healthier eating habit as compared to their pre-treatment dietary habit.

A soft diet included boiled vegetables, mashed rice, fruits, milk and various juices and thus avoiding snacks and high sugar content foods. Ashkenazi M in 2012⁽¹⁴⁾ reported that patients adopted a healthier diet as a response to fixed appliance treatment.

Conclusion

- a. Patients undergoing orthodontic treatment experience pain and discomfort, procedure like separator placement and initial wire placement can cause significant amount of pain. Precaution should be taken during these procedures.
- b. A healthy dietary change was observed in patients as a response to fixed appliance.
- c. No significant change in the behavior of the patients was observed during the orthodontic treatment.

References

1. Kvam E, Gjerdet NR, Bondevik O. Traumatic ulcers and pain during orthodontic treatment. *Community Dent Oral Epidemiol* 1987;15:104-7.
2. Ngan P, Bradford K, Wilson S. Perception of discomfort by patients undergoing orthodontic treatment. *Am J Orthod Dentofacial Orthop* 1989;96:47-53.
3. Serl HG, Klages U, Zentner A. Pain and discomfort during orthodontic treatment: causative factors and effects on compliance. *Am J Orthod Dentofacial Orthop* 1998;114:684-91.
4. Har-Zion G, Brin I, Steiner J. Psychophysical testing of taste and flavor reactivity in young patients undergoing treatment with removable orthodontic appliances. *Eur J Orthod* 2004;26:73-8.
5. Kvam E, Bondevik O, Gjerdet NR. Traumatic ulcers and pain in adults during orthodontic treatment. *Community Dent Oral Epidemiol*. 1989;17(3):154-7.
6. Scheurer PA, Firestone AR, Burgin WI. Perception of pain as a result of orthodontic treatment with fixed appliances. *Eur J Orthod*. 1996;18(4):349-57.
7. Oliver RG, Knapman YM. Attitudes to orthodontic treatment. *Br J Orthod* 1985;12:179-88.
8. Klumper GT, Hiser DG, Rayens MK, Jay MJ. Efficacy of a wax containing benzocaine in the relief of oral

- mucosal pain caused by orthodontic appliances. *Am J Orthod Dentofacial Orthop* 2002;122:359-65.
9. Bergius M, Kiliaridis S, Berggren U. Pain in orthodontics: a review and discussion of the literature. *J Orofac Orthop*. 2000;61(2):125-37.
 10. Seymour RA, Simpson JM, Charlton JE, Phillips ME. An evaluation of length and end-phrase of visual analogue scales in dental pain. *Pain*. 1985;21(2):177-85.28.
 11. Huskisson E C. Visual analogue scale. In: Melzack R (ed). *Pain measurement and assessment*. Pp 33-37. Raven Press, New York (1983).
 12. Jones M, Chan C. The pain and discomfort experienced during orthodontic treatment: a randomized controlled clinical trial of two initial aligning arch wires. *Am J Orthod Dentofacial Orthop*. 1992;102(4):373-81.
 13. Brown DF, Moerenhout RG. The pain experience and psychological adjustment to orthodontic treatment of preadolescents, adolescents, and adults. *Am J Orthod Dentofacial Orthop*. 1991;100(4):349-56.
 14. Ashkenazi M, Levin L. Pain prevention and management during orthodontic treatment as perceived by patients. *Orthodontics (Chic.)* 2012;13:e76-81.