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RESEARCH ARTICLE

PAIN PERCEPTION DUE TO ELASTOMERIC SEPARATOR PLACEMENT

[1,*]Sharmada B.K., [2]Amtul Salma, [3]Hemanth, M., [4]Karthik Kabbur, [5]Goutham, K., [6]Darsan J.P., [7]Fatima Khalidij and [8]Suchitra, M.P.

[1]MDS, Reader, Department of Orthodontics and Dentofacial orthopedics, Dayananda Sagar College of Dental Sciences, Postgraduate Student
[2]MDS student,Department of Orthodontics and Dentofacial orthopedics, Dayananda Sagar College of Dental Sciences
[3]Professor & Head of Department, Department of Orthodontics and Dentofacial Orthopedics, Dayananda Sagar College of Dental Sciences
[4]Professor, Department of Orthodontics and Dentofacial Orthopedics, Dayananda Sagar College of Dental Sciences
[5]Reader, Department of Orthodontics and Dentofacial Orthopedics, Dayananda Sagar College of Dental Sciences
[6,7,8]Senior Lecturer, Department of Orthodontics and Dentofacial orthopedics, Dayananda Sagar College of Dental Sciences

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ABSTRACT

Objective: The aim is to determine the perception of pain and discomfort by the patient during the placement of orthodontic separators. **Methods:** Elastomeric separators were placed mesially and distally to the first molars in 200 orthodontic patients, and the participants were given self-administrated questionnaires to document perceived pain, type of pain felt, pain upon chewing, and the severity of pain's affecting daily life, using a visual analog scale for three days. **Results:** The mean perceived pain scores out of 100 on the first 3 days were:49.00±27.7 88.00±30.7 and 25.12±14.3 respectively; chewing pain scores were: 49.25± 33.49 ,78.80 ± 44.2, 31.21± 20.01,respectively; the pain's affecting daily life scores were16.7 ± 26.7,28.1± 38.7, 14.6±12.1, respectively. A Kruskal–Wallis test showed a statistically significant difference in the reported pain between the studied parameters. **Conclusion**: 51.7% of population reported pain after separator placement.88% of patients reported the maximum intensity of pain one day after separator placement. Intensity of pain reduced two days after separator placement.56.12% of patients had to change their food consistency.

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INTRODUCTION

There has been an increasing demand for orthodontic treatment, so making the procedure as painless as possible is the duty of orthodontist. The mechanisms whereby the application of orthodontic forces cause pain are due to changes in blood flow in periodontal ligament and correlated with the presence of prostaglandins, substance P and other substances (Monika Mahajan, 2017).

The order of severity of pain of different orthodontic procedures (Vinod Krishnan, 2007):

- Orthopaedic forces and sutural strain due to headgear, RME (Vinod Krishnan, 2007).
- Orthodontic separator placement
- Extraction for orthodontic purpose.
- Archwire placement and activation.
- Wearing elastics.
- Debonding.
- Several methods were proposed to address the pain associated with orthodontic treatment including:
- Patient education and motivation
- Psychological and behavioral management
- Chewing gum and biting on wafers.[3]
- Dietary modifications.
- Application of anesthetic gel.
- Administration of nonsteroidal antiinflammatory drugs (NSAIDs) (Asra Sabir Hussain, 2017)

AIM OF THE STUDY: The aim is to determine the perception of pain and discomfort by the patient during the placement of orthodontic separators.This study aims to understand the average pain threshold and pain perception of patients undergoing orthodontic treatment using the subjective visual analog scale.

Corresponding author: **Sharmada B.K.,**
MDS, Reader, Department of Orthodontics and Dentofacial orthopedics, Dayanand Sagar College of Dental Sciences, Postgraduate Student.

MATERIALS AND METHODS

In patients undergoing fixed orthodontic treatment on the day of separator placement a questionnaire consisting of 13 questions related to intensity duration and severity of pain was given to patient. Patients were instructed on how to answer the questions.

Dayananda sagar college of dental sciences. Department of orthodontics and dentofacial orthopedics.

PERCEPTION OF PAIN QUESTIONNIARE

Name: Date:

Age & Sex: Your dentist/orthodontist:

1) Did you experience any pain during or after separator placement?

a) Yes b) No

2)What was the type of pain?

a) Continuous b) Intermittent

3)When was the pain felt?

a) During placement of separators
b) After placement of separators
c) 1st day after separator placement
d) 2nd day after separator placement

4)When was the pain maximum?

a) During separator placement
b) After separator placement
c) One day after separator placement
d) 2 days after separator placemen

5)What was the intensity of pain?

0 1 2 3 4 5 6 7 8 9 10
0 is absolute absence of pain and 10 is severe and maximum pain that can be felt.
Rate the scale depending on the severity of the pain felt

6)Did the pain interrupt your meals?

a) Yes b) No

7)Did the pain increase while eating or chewing?

a) Yes b) No

8)Did you change your food consistency to soft and finer foods?

a) Yes b) No

9)Did you feel the sense of taste has worsened?

a) Yes b) No

10)Does the pain interfere with your routine work?

a) Yes b) No

11)Have you been irritable with other people due to pain?

a) Yes b) No

12)Was the pain relieved with any other activity?

a) Yes b) No

13)Did you consume any painkiller?

a) Yes b) No

If yes which painkiller was prescribed?

The questionnaire consisted of questions that documented the perceived "pain," "pain upon chewing," and "severity off pain's affecting daily life activities," using a visual analog scale (VAS) with 10 marks for graded scoring.The participants were asked to mark spots on the line that they believed best represented the pain they perceived at that time. On the right end of the line, the phrase"no pain at all" was written, while on the left end, the phrase"very severe pain" was written.

STATISTICAL ANALYSIS: The data were analyzed using IBM® SPSS® Statistics, version 20 (International Business Machines Corporation, Armonk, New York, USA), and the level of significance was set at $P < 0.05$. Descriptive statistics and comparisons between different parameters of pain and pain scores were calculated.

RESULTS

48.3% of patients reported pain during placement of separators and 51.7 % of patients reported pain after separator placement.53.04% patients reported with intermittent pain and 46.95% reported continuous pain. Maximum intensity of pain according to VAS was experienced 1 day after separator placement . Pain percieved was moderate in intensity in 68.5% of patients ,severe in 20% of patients and mild in 12% of patients.78.8% of patients reported pain while eating and 56.12% of the patients changed their diet to soft.48.5 % of patients routine work was affected..30% of patients comsumed painkillers and the commonly prescribed painkiller was paracetamol. A Kruskal–Wallis test showed a statistically significant difference between the studied parameters ($P < 0.01$).“Pain” and “pain upon chewing” scores were significantly higher than the “pain's affecting daily life” scores. Pain scores started to decrease significantly after the 2nd day when each of the parameters was studied over the study period.

DISCUSSION

This study included 200 orthodontic patients. Questionnaire forms was given to these patients and the pain perception was recorded from the beginning of separator placement to 3rd day after separator placement. During separator placement 48.3% of patients reported pain, and 51.7 % of patients reported pain after separator placement.The placement of elastomeric separators causes displacement of teeth and the immediate release of biochemicals in the gingival fluid, followed by an increase in the level of prostaglandins E2 and interleukin 1 the next day.[2] Therefore the intensity of pain is at its highest after 24 hours, remains bothersome for the next few days and diminishes over next 4 to 5 days.

Table 1. Mean and Standard deviation of pain scores of the parameters reported during the study of three day period

TIME	PATIENTS (N=200)					
	PAIN		CHEWING		DAILY LIFE	
	MEAN	SD	MEAN	SD	MEAN	SD
DAY 1	49.00	27.7	49.25	33.49	16.7	26.7
DAY 2	88.00	30.7	78.80	44.21	28.1	38.7
DAY 3	25.12	14.3	31.21	20.01	14.6	12.1

Most of the patients felt an intermittent pain and it was moderate in intensity(according to VAS). Since the pain is inflammatory, nonsteroidal anti-inflammatory drugs are the gold standard in reducing the discomfort, The highest consumption of analgesics (30% of patients) was reported one day after placement of separators & the commonly prescribed analgesic was paracetamol. The intensity of the pain increased to maximum one day after separator placement, which gradually declines until the 3rd day which is similar in accordance with the results obtained by Kapoor et al[4].Asiry et al[5].,Ngan et al[6-8].78.8% of patients reported pain while eating,while 56.12% of patients had to change their food consistency. Among daily activities, eating was most affected during the separation period, and the influence on food choices was reasonably considerable since most of the patients had changed their dietary pattern to soft diet. These findings are in accordance with other previous studies. Scheurer et al.[9] reported that the influence of fixed orthodontic appliances on eating/chewing was significantly higher than the influence on daily life. 28.1% of patients stated that their daily activities were influenced. Bondemark et al[10]. showed that the effect of separator placement on leisure activities was small.Firestone et al.and Bergius et al.reported that the patients' perceptions of the severity of their malocclusions were not related to their feeling of discomfort during orthodontic treatment. Otasevic et al[11] found that a total of 30% of orthodontic patients discontinued their treatment because they experienced pain. Therefore, patients should be informed that the pain arises from the elastomeric separators and they should be educated on proper management by changing food consistency or using analgesics.

Conclusion

- 51.7% of population reported pain after separator placement.
- 88% of patients reported the maximum intensity of pain one day after separator placement.
- Intensity of pain reduced two days after separator placement.
- 56.12% of patients had to change their food consistency.
- The highest consumption of analgesics was reported after 1st day of separator placement.

Key points:

- Orthodontic pain is correlated with the presence of prostaglandins ,substance P and other substances.
- Nonsteroidal antiinflammatory drugs (NSAIDs) are gold standard for management of orthodontic pain.

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