

Original Article

Patient pain response and discomfort during self ligation mechanotherapy

ABSTRACT

Aim: The aim of this research is to assess the patient's pain response and discomfort in patients treated with self-ligating bracket system.

Objective: Patients undergoing orthodontic treatment quite often complain about pain and discomfort during various stages of orthodontic treatment, and hence, sufficient precaution should be taken to minimize them.

Materials and Methods: The study was conducted on a sample size of 15 patients who were reported to the Department of Orthodontics. The patients were undergoing orthodontic treatment with self-ligating brackets. The patients were requested to complete a questionnaire about duration of treatment, pain, or discomfort experienced after regular monthly activation of brackets, duration, onset and severity of pain, difficulty in brushing or chewing food, and food accumulation between the teeth.

Results: Out of 15 patients, only six patients were aware of that they are wearing self-ligation bracket while nine other patients do not know that they are wearing self-ligation bracket. Almost 80% of the patients experienced pain and discomfort after regular monthly activation of brackets, whereas 20% of the patients did not experience any pain and discomfort after regular monthly activation of brackets. Thirteen percent experienced slight pain, 47% experienced mild pain, 7% experienced moderate pain, 7% experienced severe pain, and 7% experienced very severe pain. A great majority of patients (67%) stated that the pain started few hours after activation while 13% of patients stated that the pain started few minutes after activation. Seventy-three percent of the patients stated that the pain lasted for the whole day and 7% patients stated that the pain lasted for hours. Fifty-three percent of the patients reported difficulty in brushing and chewing food while remaining 47% did not have any difficulty in brushing and chewing food. Most of the patients about 87% reported food accumulation in between the teeth.

Conclusion: This study highlighted the pain and discomfort experienced by the patient during self-ligation bracket system. Pain and discomfort caused in the initial stage of fixed orthodontic treatment can be moderate to severe and might last for few days. Brushing teeth might cause mild discomfort and pain can be minimized by consuming soft food. Most of the patients undergoing self-ligating bracket system experienced pain and discomfort after regular monthly activation of brackets.

Key words: Discomfort; orthodontic; pain; self-ligation; treatment.

Introduction

Orthodontic treatment is often related to pain and discomfort. The patients undergoing orthodontic treatment usually experience pain and discomfort to a varying degree during treatment. The international association for the study of pain has defined pain as an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage.^[1] Discomfort is usually expressed as unpleasant tangible sensation, feeling of constraint

in the oral cavity, stretching of the soft tissues, pressure on the mucosa, displacement of the tongue, soreness of the teeth, and

PRIYANGAA SATHASIVAM, RAVINDRA KUMAR JAIN¹

Departments of Orthodontics and Dentofacial Orthopedics,
¹Orthodontics, Saveetha Dental College and Hospitals,
Chennai, Tamil Nadu, India

Address for correspondence: Dr. Priyanga Sathasivan,
Saveetha Dental College and Hospitals, Chennai - 600 077,
Tamil Nadu, India.
E-mail: priyanga.vin@gmail.com

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pain.^[1-4] Orthodontic treatment starts from the stage of initial examination of the patient for malocclusion to debonding of the appliance at the end of treatment and includes major events such as extraction of few teeth, separator placement, and bonding and banding, archwire placement, and activation.^[5] Therefore, the patients are exposed to pain stimuli throughout the entire procedure. Furstman and Bernick suggested that periodontal pain was caused by process of pressure, ischemia, inflammation, and edema.^[6] Orthodontic treatment usually exerts pressure on teeth resulting in the release of prostaglandins. Prostaglandins are the mediators of inflammatory process and hence cause pain.^[3,7]

Hence, the present study was done to evaluate the response of patients to orthodontic treatment with self-ligating brackets.

Materials and Methods

The study was conducted on a sample size of 15 patients who reported to the Department of Orthodontics, Saveetha Dental College, and received orthodontic treatment with self-ligating brackets. A questionnaire was prepared to evaluate the patient's knowledge of the different appliance system, presence of pain and discomfort, difficulty in brushing, plaque retention, etc.,. The patients were requested to complete the questionnaire.

The answers were analyzed and the different variables were tabulated.

Results

According to Figure 1 duration of treatment was more than one year in 53 % of the cases, less than 6 months in 18% of the cases. Out of 15 patients, only six patients were aware of that they are wearing self-ligation bracket while nine other patients do not know that they are wearing self-ligation bracket. According to Graph 1 almost 80% of the patients experienced pain and discomfort after regular monthly activation of brackets, whereas 20% of the patients did not experience any pain and discomfort after regular monthly activation of

brackets. Figure 2 shows duration of pain experienced by the patient after regular monthly activation of brackets. Thirteen percent experienced slight pain, 47% experienced mild pain, 7% experienced moderate pain, 7% experienced severe pain, and 7% experienced very severe pain as shown in Figure 3. A great majority of patients (67%) stated that the pain started few hours after activation while 13% patient stated that the pain started few minutes after activation. Seventy three percent

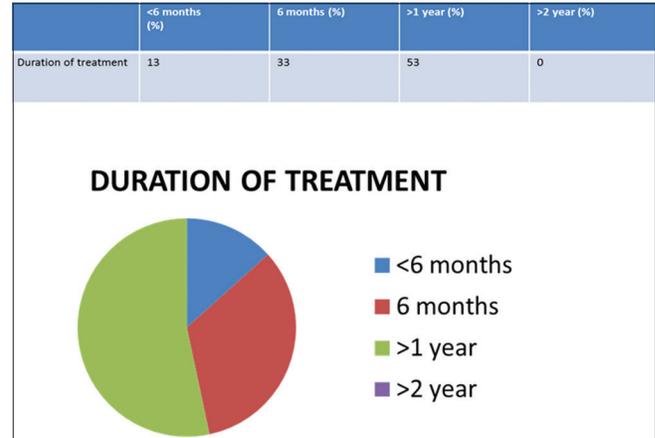


Figure 1: Duration of treatment

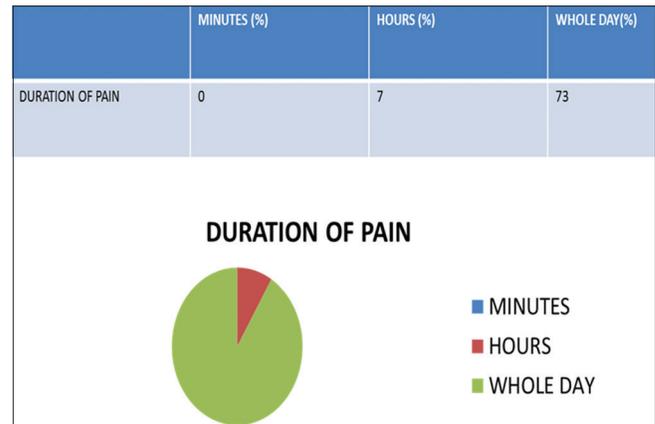
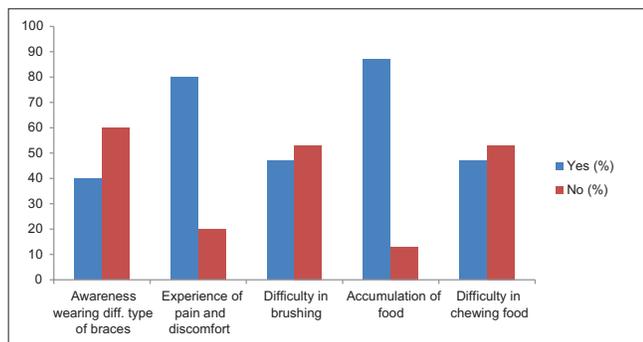


Figure 2: Duration of pain



Graph 1: The percentage of awareness, pain, and discomfort experienced by the patients receiving self-ligating bracket system

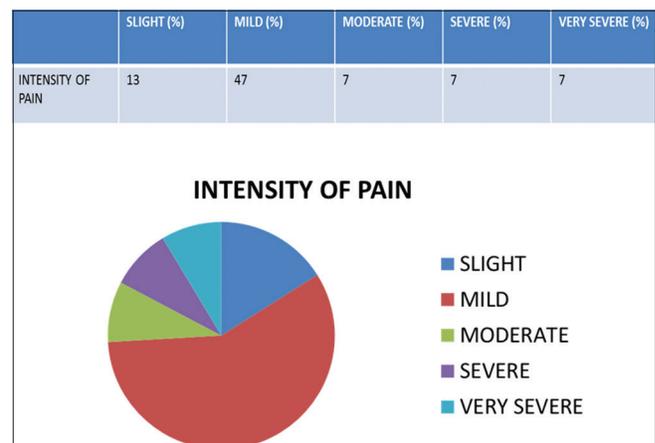


Figure 3: Intensity of pain

of the patients stated that the pain lasted for the whole day and 7% patients stated that the pain lasted for hours as shown in Figure 4. Fifty-three percent patients reported difficulty in brushing and chewing food while remaining 47% did not have any difficulty in brushing and chewing food. According to the Table 1 most of the patients about 87% reported food accumulation in between the teeth.

Discussion

Self-ligating brackets have been a major focus of attention in orthodontics in recent years as shown by the various designs developed by manufacturers of orthodontic material.^[8] Pellegrini *et al.* in their study concluded that active self-ligating brackets are less likely to accumulate dental plaque when compared to conventional brackets. Nevertheless, it is speculated that active self-ligating brackets allow better hygiene as they do not have locks or clips completely closing the bracket slot and forming a fourth wall similar to molar tubes.^[9]

Usually, patients perceive orthodontic treatment as a painful procedure. It is reported in the study of Kvam *et al.* that 95% of the patients experience pain after orthodontic treatment out of which very few only experience severe pain.^[10] In our study, only 80% of the patients experienced pain and discomfort after regular monthly activation of the brackets out of which only 7% experienced severe pain. In general, regardless of the type of appliance used, pain is higher during first 2 or 3 days after appliance activation.^[1,2,11-14]

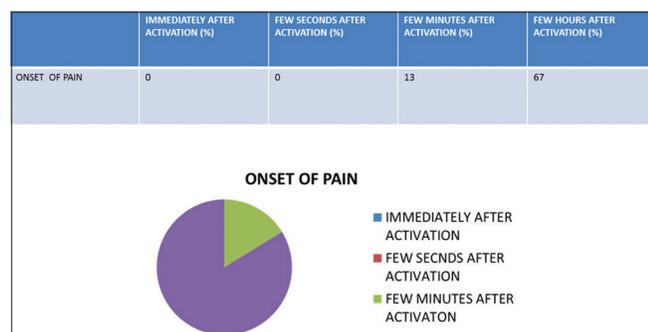


Figure 4: Onset of pain

Table 1: Awareness, pain, and discomfort experienced by patients during self-ligating bracket system-number of patients with its percentage

	Yes	Percentage	No	Percentage
Awareness wearing different type of braces	6	40	9	60
Experience of pain and discomfort	12	80	3	20
Difficulty in brushing	7	47	8	53
Accumulation of food	13	87	2	13
Difficulty in chewing food	7	47	8	53

According to 90% of patients, orthodontic treatment is painful, and 30% might prematurely discontinue treatment because of pain.^[15,16] Earlier studies agree that the pain peaks in the first 24 h and does not last long thereafter. Orthodontic pains appear to be caused primarily due to compression of the periodontal ligament under orthodontic forces, especially during the initial stages of tooth movement.^[2,11,14]

Although all studies agree that pain occurs during orthodontic treatment, there are large variations between reported prevalence rates, intensities, and duration of pain. As pain is subjective by nature, it is extremely difficult to measure, especially because it varies considerably from case to case and depends on several individual variations, such as age, gender, and stress.^[2,11-15]

Minor pain and discomfort are experienced while brushing teeth and severe pain and discomfort during mastication. According to Table 1 around 47% of the patients reported difficulty in chewing fibrous, sticky, or firm foods, but consuming soft foods significantly reduced pain frequency. Hence, the patients prefer food that is soft in consistency. Similar kinds of results were reported by Brown and Moerenhout in 1991.^[17]

A study by Tecco *et al.* reported that the patients treated with conventional brackets seem to experience higher and more intense pain and for longer period than those treated with self-ligating brackets. The patients treated with conventional brackets reported mostly a constant pain as opposed to a chewing pain reported by the patients treated with self-ligating brackets.^[18]

Conclusion

This study highlighted the pain and discomfort experienced by the patient during self-ligation bracket system. Pain and discomfort caused in the initial stage of fixed orthodontic treatment can be moderate to severe and might last for few days. Brushing teeth might cause mild discomfort and pain can be minimized by consuming soft food. Most of the patients undergoing self-ligating bracket system experienced pain and discomfort after regular monthly activation of brackets.

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Conflicts of interest

There are no conflicts of interest.

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