

# Popularity and Perceived Efficiency of Self Ligating Brackets among Orthodontists

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## Abstract:

**Purpose of The Study:** To assess the popularity of self ligating bracket among orthodontic practitioners and orthodontic residents and their perceived competence or efficiency in clinical practice.

**Materials and Methods:** It is a cross-sectional questionnaire-based study. A questionnaire was distributed to 100 orthodontists in Tamilnadu including orthodontic residents to evaluate SLB and CB in terms of their perception.

**Results:** Out of the total respondents, 62% were orthodontic practitioners and 38% were orthodontic residents. 78% of the total respondents said they were using self ligating brackets of which 69% were females. Out of those using SLB's, 78% preferred an 0.022 slot and 18% preferred an 0.018 slot.

**Conclusion:** Self ligation has seen a growth in the number of products available and number of doctors using this technology in the past two decades. Significant choice of self ligation was based on chairside time, rate of alignment, oral hygiene of patient, patient comfort and the past experience with the system.

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## INTRODUCTION:

Fixed orthodontic appliances have the forces required for tooth movement in their archwires. For this force to be transmitted to the tooth, the wire needs to establish a contact with the bracket which in turn is fixed to the tooth completely. Establishing this contact was achieved by the use of ligation using elastomeric modules or ligature wires. This remained a solution for several decades. There were several impediments to the use of conventional ligation viz., failure to provide and maintain full archwire engagement in the bracket and relatively high friction.<sup>1</sup> Self-ligating systems have remained in practice since 1935, with the introduction of "Russell lock" edgewise attachment by Stolzenberg.<sup>2</sup> Newer self-ligating brackets are being patented in increasing number though all are not being available commercially.<sup>3</sup> They are gaining popularity in the recent times for several advantages. The most important of them all being full archwire engagement and low friction.<sup>4,5,6,7</sup>

The most compelling potential advantages attributed to SLBs are a reduction in overall treatment time<sup>5,8</sup> and less associated subjective discomfort.<sup>9</sup> Other purported improvements include more efficient chairside manipulation<sup>10</sup> and promotion of periodontal health due to poorer biostability. Preliminary retrospective research has pointed to a definite advantage, with a reduction in overall treatment time of 4 to 7 months and a similar decrease in required appointments.<sup>9,11</sup> Consequently, the use of SLBs has increased exponentially; over 42% of American practitioners surveyed reported using at least one system in 2008.<sup>12</sup> This figure was just 8.7% in 2002.<sup>12</sup> The purpose of this study was to compare perceptions of efficiency of self-ligating brackets(SLB) vs. conventional

brackets(CB) between practicing Orthodontists and Orthodontic Residents. This paper is not aimed at determining true merits or effectiveness of self-ligation, but rather determining if and why practitioners are choosing self-ligation systems over conventional mechanics.

## MATERIALS AND METHODS:

Prior to the start of the study, approval was obtained from the Institutional Review Board of Saveetha Institute of medical and technical sciences. A prevalidated fourteen item questionnaire was developed to determine whether responding orthodontists perceived differences in clinical performance between SLB and CB based on their experience with these appliances.

A convenience sampling methodology was adopted, wherein respondents were randomly added in the study. An electronically generated questionnaire was circulated among the orthodontists across the state and their response were evaluated and study was scheduled for one week.

The initial series of questions obtained individual practitioner characteristics and focused on the responding clinician's experience with SLB in his practice. The second part of the survey assessed a variety of treatment factors, allowing orthodontists to indicate a preference for either SLB or CB based on their experience and perceived clinical results, duration of treatment time, discomfort experienced by the patients were some of the factors evaluated in this section of the study. The respondents were asked to mark on a scale of 5 how influential each factor was for their decision to use self ligating brackets (1 being not at all influential and 5 being extremely influential)

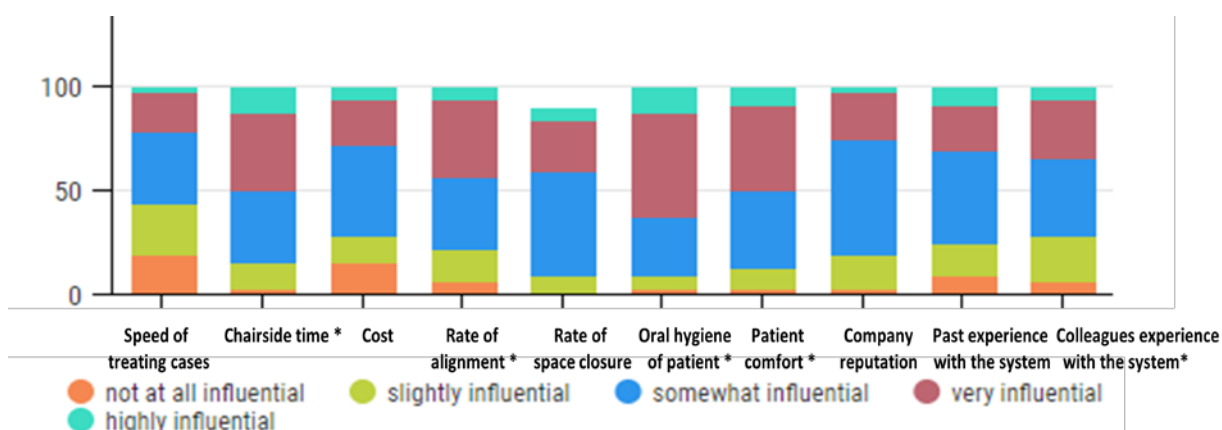


Figure 1: Bar graph representing the Likert scale of Orthodontists to Various Perceptions

Descriptive statistics using mean and percentage was used to describe the results of this study.

### RESULTS:

Out of the total respondents, 62% were orthodontic practitioners and 38% were orthodontic residents. 78% of the total respondents said they were using self ligating brackets of which 69% were females. Out of those using SLB's, 78% preferred an 0.022 slot and 18% preferred an 0.018 slot. The practitioners' preferences for either SLB or CB with regard to a variety of treatment factors are summarized in Figure 1.

23% orthodontists considered the overall treatment time as highly influential when considering a SLB and 43% reported that it is less influential. As far as cost is concerned, 70% orthodontists consider it to be an influential factor to choose between the two systems. Out of the total respondents, 30% found the rate of space closure and 42% the rate of initial leveling of teeth to be influential factor. More than 65% of orthodontists chose the bracket system based on the patients oral hygiene as well as the patient comfort. Their past experience with the system was also influential on deciding among 70% of the orthodontists.

### DISCUSSION:

Minor amount of respondents did say that the overall treatment time was influential. Prospective research considering surrogate measures of treatment efficiency, including the efficiency of orthodontic alignment and rate of space closure, has shown little difference between fixed appliance types, with remarkable consistency.<sup>13</sup> Certain studies<sup>8,9</sup> on treatment efficiency have found that on average, patients treated with SLB finished treatment 4 to 6 months sooner and had four to seven fewer appointments than did patients with CB.

As far as the rate of alignment and space closure is concerned, a recent systematic review<sup>14</sup> reported that currently prospective research considering the efficiency of orthodontic alignment and rate of space closure has consistently shown few differences between SLB and CB. One of these studies<sup>15</sup> reported no overall difference between the two modes of ligation in terms of the time

required to resolve mandibular crowding. Another study<sup>16</sup> found no difference in the rate of en masse space closure between passive SLB and CB.

SLB have also been proposed<sup>17</sup> to improve oral hygiene in patients as a result of decreased plaque retention with the elimination of elastomeric ligatures. In this study, orthodontists indicated a significant preference for SLB when comparing oral hygiene in patients with SLB and CB. However, several studies<sup>18,19</sup> reported that there are no significant differences in oral hygiene between the patients bonded with CB and those bonded with SLB. Moreover, there are studies which say that may deteriorate the efficiency of SLB by weakening the shutter system in them.

Currently available SLBs are clearly more expensive than most CB. A concern repeated by many orthodontists was whether any perceived increase in clinical efficiency with SLB justified the increased cost.<sup>14</sup> From this study, 70% orthodontists considered cost as an influential factor for selecting between the two systems. In fact, the majority of orthodontists who discontinued use of SLB reported doing so mainly because they did not see significant enough advantages over CB brackets to make up for the increased cost.<sup>20</sup>

### CONCLUSION:

Self ligation has seen a growth in the number of products available and number of doctors using this technology in the past two decades. Significant choice of self ligation was based on chairside time, rate of alignment, oral hygiene of patient, patient comfort and the past experience with the system.

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