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Comparison of dislodgment between four different types of orthodontic separators

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Abstract

To evaluate the record the number of different separators lost. The study population consisted of 40 subjects (20 girls and 20 boys) in the age range of 12-16 years. The four separators i.e. Elastomeric separators, Dumbbell separators, Kesling separator and kansal separator were placed alternately in four different quadrants in each patient to avoid right and left and maxillary and mandibular bias. Dumbbell separator showed (20%) highest frequency of loss and kansal separator the least (1.25%).

Keywords: dislodgment, orthodontic separators

Introduction

Separators are used in dental practice to create a space usually between molars prior to placement of orthodontic bands and crown restoration. They are also useful in eruption of partially impacted teeth especially second molars and make reproximation of adjacent teeth easier. A separator is considered ideal if it is easy to place, radiolucent, provides sufficient separation with minimum pain and discomfort, with minimum or no loss after placement. Orthodontic armamentarium has a variety of separators eg. Kesling, Elastomerics, Dumbbell, Brass wire, Kansal and NEET separators etc. Spring and elastomeric separators are most commonly used type. Spring made of stainless steel or nickel titanium can be used to achieve required separation. Prior to these, separation was achieved by placing 0.05 to 0.06mm brass wire for 5 to 7 days. Thus, it was a traumatic procedure and patient often had pain and difficulty in chewing food.

Tightness of contact point decreases due to eating or brushing. This can lead to loss of separator and movement of tooth to its initial position. This can affect the treatment thus a protocol to know adequate time for separation needs to be determined^[1].

Different separators vary in the amount of pain caused during separation, their efficacy and maintenance of separation. Some can irritate the mucosa like brass wire and spring separators, where as some tend to loosen easily. A band should be seated after required separation otherwise hyalinised areas can be created in the periodontal ligament which can cause pain². Pain and discomfort due to separator placement is the most common chief complaint of the patients and one of the reason for avoiding orthodontic treatment^[3,4]. Since, there is limited research data^[5] available on orthodontic separators; our study was designed to compare efficacy of different separators.

Aims and Objectives

- 1) To record the number of different separators lost i.e Kesling separator, Kansal separator and Dumbbell separator.

Materials and Methods

The study population consisted of 40 subjects (20 girls and 20 boys) in the age range of 12-16 years. The subjects were randomly selected from patients visiting the Department of Orthodontics and Dentofacial Orthopedics Mahatma Gandhi Dental College & Hospital, Jaipur, Rajasthan. The ethical clearance for the study was obtained from Institutional Ethical Committee of Mahatma Gandhi Dental College and Hospital, Jaipur.

Inclusion Criteria

1. Healthy patients requiring fixed orthodontic treatment in maxillary and mandibular arches with no systemic disease.
2. Patients with bilaterally tight contact between 2nd premolar, 1st molar and 2nd molar.
3. Healthy periodontium
4. Fully erupted mandibular second molar

Exclusion Criteria

1. Patients with gingival and periodontal problems
2. Root Canal Treated teeth in the arch
3. Patients undergoing orthodontic treatment
4. Presence of inter-proximal caries or restorations
5. Presence of inter-dental spaces

Apparatus used in this study (Fig-1)

1. Elastomeric separator
2. Kesling separator
3. Kansal separator
4. Dumbbell separator
5. Separator placing plier
6. Straight howe plier
7. Light wire plier



Fig 1: Different separators and separator placing plier

Method of collection of Data

The above mentioned four separators were placed alternately in four different quadrants in each patient to avoid right and left and maxillary and mandibular bias. Kansal and Kesling separators were placed using a light wire plier, Elastomeric and Dumbbell separator were placed using a separator placing plier and straight howe plier (Fig-2 and fig-3). The patient was evaluated for 5 days for amount of separation, pain perception and loss of separator in each quadrant.

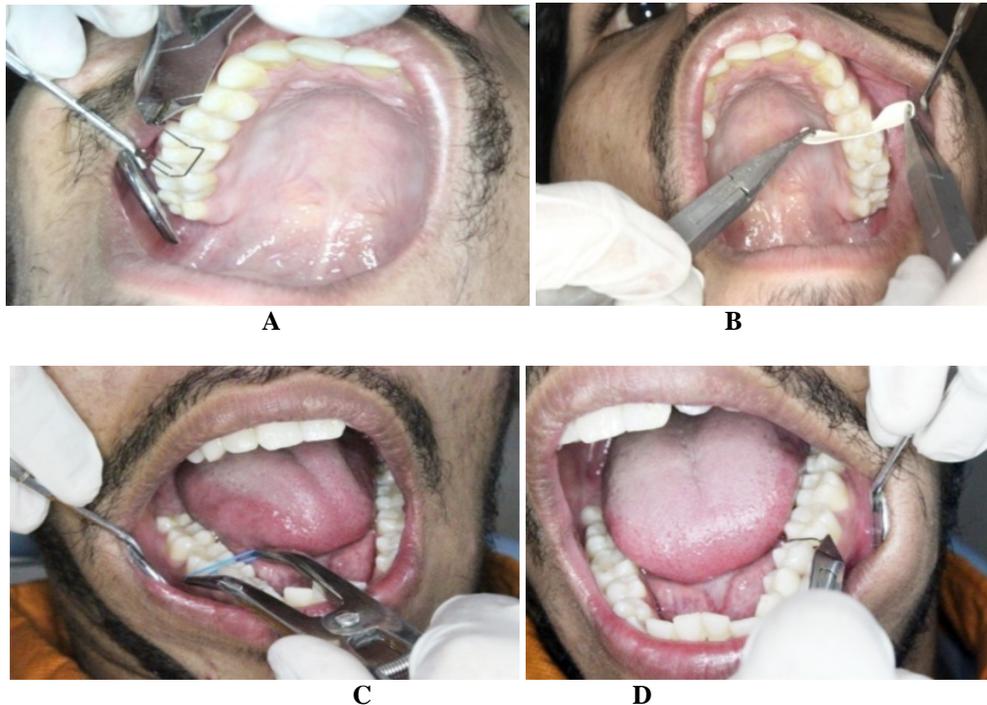


Fig 2: Separators placement: **A.** Kansal separator in maxillary right side, **B.** Dumbbell separator in maxillary left side, **C.** Elastomeric separator in mandibular right side, **D.** Kesling separator in mandibular left side.



Fig 3: After separators placed in: **A.** Maxillary arch (Right and Left side) **B.** Mandibular arch (Right and Left side)

Results

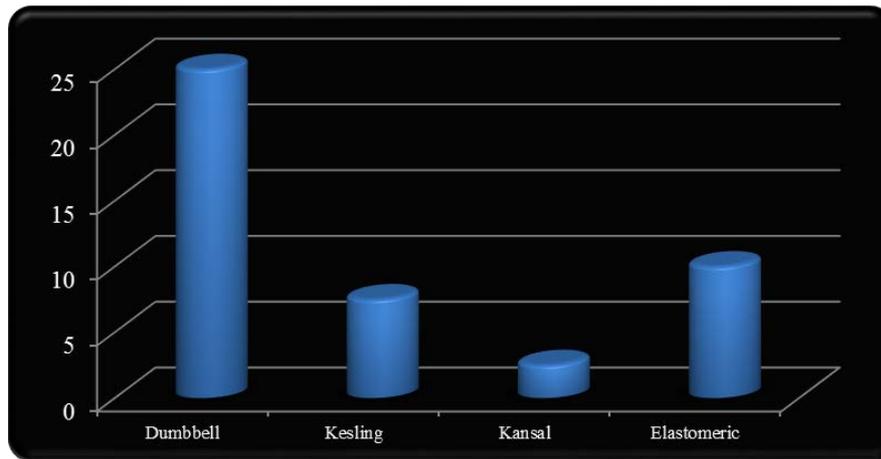
Table 1 shows the percentage of patients in whom the separator lost and percentage of separator lost.

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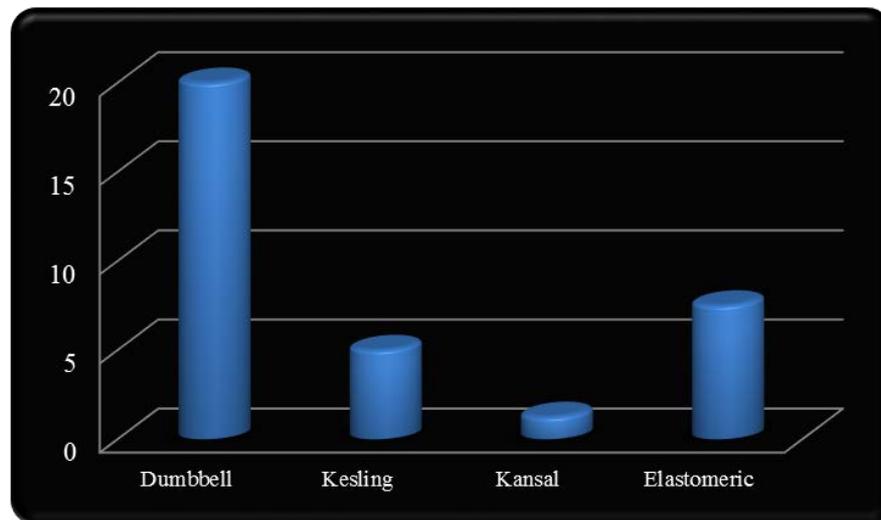
Name of separator	No. of patients in whom the separator lost		Total No. of separator lost	
	No.	%	No.	%
Dumbbell	10	25	16	20
Kesling	3	7.5	4	5
Kansal	1	2.5	1	1.25
Elastomeric	4	10	6	7.5

The study shows that total 27 separators were lost; 16 dumbbell, 4 kesling, 1 kansal and 6 elastomeric separator. Dumbbell separator showed (20%) highest frequency of loss

and kansal separator the least (1.25%) (Table-1) (Graph-1, 2).



Graph 1: Shows the percentage of patients in whom the separator lost



Graph 2: Shows the percentage of separator lost

Discussion

Separation is one of the most important process for fixed orthodontic treatment. Pain and discomfort are most common chief complaint of patient during separation period. It was found that the amount of separation by dumbbell separator was significant at day 1 to day 5 compared to three other separators. This was in agreement with the study done by Malagan *et al* [1] where a significant difference was observed between four type of separators; elastomeric, kesling, dumbbell and NEET spring on day 1, 2 and 3. Elastomeric separators also showed statistically significant amount of separation in comparison with kesling and kansal

on all five days which was similar to previous study done by Cureton and Ronald [6]. In our study reliability of elastomeric separators, 7.5% were lost which was in contrast to above study.

In the present study, Dumbbell separators provided fastest and greater amount of separation than the elastomeric, kesling and kansal separator. However, 20% of dumbbell separators were lost which was very high compared to other separators. This was in agreement with the study done by Malagan M *et al* [1]. In this study the dumbbell separator provided fastest and more amount of separation than the other 4 types of separators and frequency of loss of

separator was 16%, which was highest among other separators.

Kesling separator was easy to place in tight contact point and frequency of loss of separator is less than the dumbbell and elastomeric due to engagement of the opposite embrasure area. Pain perception was more at chewing than at rest position in all four types of separators at 1st to 5th days. This result is in agreement with Bondemark *et al* [2] study. In our study the pain was worst at 2 and 3 day and gradually decreased at 4th and 5th day. This result agrees with Bondemark *et al* [2] study. In the present study the elastomeric separator was more painful than the kesling and kansal separator; similar to earlier study done by Nalbantgil *et al* [3] in which the elastomeric separators was more painful than the brass wire separators. Also loss of elastomeric separator in the above study was more than the brass wire separator but in our study the frequency of loss of elastomeric separator was more than the kesling and kansal separator but less than the dumbbell separator.

A study conducted by Bothra *et al* [7] shows that the loss of “elastomeric” separator is significantly higher than the “kansal” separators. Similarly, in the present study, the Elastomeric separators were lost significantly more than kansal separators.

Thus, dumbbell separator is highest frequency of loss compare to other three types of separator.

Conclusions

Dumbbell separator showed (20%) highest frequency of loss and kansal separator the least (1.25%).

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