

# Comparative Study of Efficacy of Four Different Types of Orthodontic Separators

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## ABSTRACT

**Background:** Separators are used by dentists for positioning orthodontic bands between molars. They also benefit for partially damaged teeth, especially in secondary molars, and make the re-approximation of adjacent teeth easier. The objective is to the goal of this analysis was to determine the degree of separation between four orthodontic separators: Kansal, Dumbbell Kesling and elastomeric separators. Design: It is a Comparative study. Duration: One year i.e from January 2018 to December 2018. Setting: Department of dentistry. Participants: 50 patients. **Methods:** Random selection was made of patients who attended the orthodontic clinic. The population of the sample consists of 50 selected participants (30 boys and 20 girls) aged 15 to 30 years. . Each of them had been alternately positioned for four different separators, Elastomeric, Dumb Bell, Kesling and Kansal, avoiding the right and left, the maxillary and the mandibular partition. **Results:** On Day 3, the separator effect was found in a Dumb Bell separator with a mean breakdown of 0.30 mm and a mean gap of 0.28 mm. Kesling Separator had a mean gap of 0.22 mm and a mean gap of 0.16 mm was found in Kansal Separator. **Conclusion:** In contrast with Kesling and kansal separators, the most effective orthodontic separators are dumbbell and elastomeric separators.

**Keywords:** Dumbbell, Kesling, Kansal, Elastomeric, Separators

## INTRODUCTION

Elastomeric or metal auxiliary products are known as spacers and are used in orthodontics, often in the spacing between teeth to allow for the mounting of the orthodontic band.<sup>[1-3]</sup> The space for easier interdental reductions is also made with separators.<sup>[4,5]</sup> Insufficient spacing leads to improper seating of the belt. The perfect separator should be easy for insert, cause less pain and separate teeth properly; it must not be lost while chewing and should stay between the teeth until it is removed by the orthodontist.

Spacers can be circular rubber loops between the upper and lower molars, around one inch in diameter or one to eight separators or tiny spring clips can be used for molars separation. The spacers are placed for 1 to 2 weeks between teeth to progressively separate teeth and move them to a distance which helps orthodontists bind or extend a ring metal bands of a tooth brace. The pain and irritation due to separator placement are the primary concern of patients and one of the reasons for delaying orthodontic care.<sup>[6,7]</sup>

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## MATERIALS AND METHODS

**Place of Study:** Department of Dentistry

**Type of Study:** It's a Cross sectional study

**Sample Collection:** Sample size: 50 patients

**Sampling Methods:** Consecutive Sampling

### Inclusion Criteria:

Our research included patients without a chronic disorder that need a specific orthodontic procedure of the maxillary arches and the mandibular arches between 15 to 30 years of age and patients with close reciprocal connections between the first and second molar and second premolar

### Exclusion Criteria:

Patients of gingival and periodontal disorder had been excluded from our research and those older than 30 years had been excluded.

### Statistical Analysis:

For statistical analysis, the data is provided as statistic tables with the programme SPSS version 20.

### Ethical Approval:

The consent of the Institutional Ethics Committee was obtained prior to the start of the study.

Random selection was made of patients who attended the orthodontic clinic. The population of the sample consists of 50 selected participants (30 boys and 20 girls) aged 15 to 30 years. . Each of them had been alternately positioned for four

different separators, Elastomeric, Dumb Bell, Kesling and Kansal, avoiding the right and left, the maxillary and the mandibular partition.

## RESULTS

**Table 1: Distribution of patients across age group and gender**

Age (Years)	No. of patients	Percentage
15 to 20	12	24%
21 to 25	18	36%
26 to 30	20	40%
Gender		
Male	30	60%
Female	20	40%

Out of 50 patients 60% were males and 40 % were females undertaken for orthodontic separators. The majority of the patients belonged to the aged group of 26 to 30 years with 40%, followed closely by 21 to 25 years age group with 36% and the least belonging to the age group of 15 to 20 years age group with 24%.

**Table 2: Efficacy of the four different separators across Day 1, Day 3 and Day 5**

	Name of separator	Mean±SD	n	P
Day 1	Dumbbell	0.06600 ± 0.07106	50	0.001
	Elastomeric	0.05901 ± 0.05189	50	
	Kesling	0.05250 ± 0.03387	50	
	Kansal	0.05109 ± 0.05739	50	
Day 3	Dumbbell	0.31659±0.035642	50	0.001
	Elastomeric	0.26745±0.03856	50	
	Kesling	0.22878±0.012620	50	
	Kansal	0.20645±0.011421	50	
Day 5	Dumbbell	0.36630 ± 0.03006	50	0.001
	Elastomeric	0.34010 ± 0.04057	50	
	Kesling	0.27531 ± 0.04034	50	
	Kansal	0.21510 ± 0.04006	50	

The separator effect was seen on day 3 and maximum on day 5 in dumb bell separator with a mean separation of 0.30mm, followed by elastomeric separator with a mean separation of 0.28mm. Kesling separator had a mean separation of 0.22mm and the least separation effect was seen in Kansal Separator with a mean separation of 0.16mm.

## DISCUSSION

Placement of the bands in the posterior area is favoured to attachment, as the posterior teeth have a stronger biting power than the anterior ones. Separation is an orthodontic technique that seeks to loosen close interproximal contacts between the teeth, thereby making it possible to fit orthodontic bands by forcing or wedging the teeth for a week normally.<sup>[8]</sup>

Given that our results did not vary substantially between the genders or the distal and mesial separating effects of the maxilla and mandibular

molars, data were aggregated and analyzed together in all four quadrants for males and females as well as for mesially and distally positioned separators. Even research by Bondemark and Cureton et al showed no significant gender difference or no sexual dimorphism as to the degree of separation achieved.<sup>[9,10]</sup>

The separation efficiency of Dumbbell provided consistently greater separation rates than any other separator used.

Dumbbell and Elastomeric separators generated a considerable amount of separation after day 1, which were enough to make the positioning of band simpler. Davidovitch et al. showed in their research that, unlike the other analysis that offers the separator positioning method for 5 and 7 days, separators could be positioned 1 day prior to band placement.

The average separation achieved by McGann was 0.008 mm from NiTi Springs, 0.009 mm from TP Springs and slightly less with elastomeric separators.<sup>[11]</sup> In a study by Hoffman done in 20 patients for 7 days, For the first, third and seventh days the Hoffmann tested the efficacy of the four separators types: brass wire, springs separation, latex elastics and acrylic elastics. He concluded that latex elastics provided the largest separation compared to others in all recorded days.<sup>[12]</sup> Cureton and Bice while Comparing isolation between elastomeric separators, NEET and TP springs, considered elastomeric separators to be more effective than others.<sup>[13]</sup> Bondemark et al obtained a mean separation of 0.3 mm from the spring type and 0.4 mm from the elastomeric separators, and concluded that two separators had a clinically equal separation effect.

After separator placement Ngan et al,<sup>[14]</sup> and Bondemark et al researched the pain response and concluded that it typically begins in 4 hrs after the separator placement and is the strongest in the next 24 hrs. It subsides in 5 to 7 days and is the least on the 7<sup>th</sup> day of orthodontic separators placement.

## CONCLUSION

The Most efficient orthodontic separators are dumbbell and elastomeric separator with great separation effect and lesser time for the separation effect to take place accordingly when compared to Kesling and kansal separators which take much more time and has lesser separation effect.

## REFERENCES

1. Begg PR. Begg orthodontic and technique. Philadelphia: W.B Sounder's company; 1965. pp. 100–01.
2. Proffit RW, Fields WH, Sarver MD. Contemporary Orthodontics. Fourth edition. Mosby Company; 2007. pp. 412–13.
3. Moyers RE. Handbook of Orthodontics. Fourth edition. Year book medical publishers; 1988. pp. 515–16.

4. Graber TM, Swain BF. Current orthodontic concepts and techniques. Second edition. W.B Sounder's company; pp. 478–501.
5. Hoffmann WE. A study of four types of separators. Am J Orthod Dentofacial Orthop. 1972;62:67–73.
6. Nalbantgil D, Cakan DG, Oztoprak MO, Arun T. Perception of pain and discomfort during tooth separation. Aust Orthod J. 2009; 25(2):110-15.
7. Goh SY, Siew TB, Mathew T. Perception of Pain for Different Orthodontic Elastomeric Separators. J Pharm Biomed Sci. 2015; 5(4):332-37.
8. Daskalogiannakis J. Glossary of orthodontic terms. Quintessence Publishing Co. Inc, 2000; 244.
9. Bondemark L. Separation effect, perception of pain & discomfort from 2 types of orthodontic separators; World J. Orthod. 2004; 5 : 172–76.
10. Cureton S, Ronald WB. Comparison of 3 types of separators in Adult patients. J. Clin Orthod. 1997:172–77.
11. McGann BD. A Nickel Titanium separating spring. J Clin Orthod. 1991; 25:5:315-8.
12. Hoffmann WE. A study of 4 types of separators. Am. J. Orthod Dentofacial Orthop. 1972; 62:67-73.
13. Cureton S, Bice RW. Comparison of 3 types of separators in adult patients. J. Clin Orthod. 1997; 172-7.
14. Ngan P, Kess B, Wilson S. Perception of discomfort by patients undergoing orthodontic treatment. Am J Orthod Dentofacial Orthop. 1989; 96:47-53.

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