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ORIGINAL RESEARCH

# Effectiveness of three different separators in terms of pain and separation effect- A Comparative Study

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***ABSTRACT*:**
**Background:** Separation of teeth to create interproximal space is the first step in banding. The present study was conducted to compare three different separators in terms of pain and separation effect. **Materials & Methods:** The present study was conducted on 102 subjects of age ranged 16- 24 years requiring orthodontic treatment of both genders. Three different separators such as Kesling separators, Elastomeric separator and brass wire were used. All subjects were assessed for 7 days to see amount of separation and pain intensity. **Results:** Age group 16- 18 years had 49.0%, 19-21 years had 31% and 22-24 years had 19.6% subjects. There was significant reduction in pain intensity on VAS scale recorded on 1st day, 3rd day and 7th day. The difference was significant (P< 0.01). Maximum separation (0.34 mm) was achieved with brass wire followed by elastomeric (0.23 mm) and kesling (0.12 mm). **Conclusion:** Brass wire separators found to be effective in causing adequate separation. The pain intensity recorded was also less as compared to other separators.
**Key words:** Elastomeric, Kesling, Separator, Brass wire.

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## INTRODUCTION

Separation is an orthodontic procedure aiming at slightly loosening the tight interproximal contacts between teeth to create space for the fitting of orthodontic brands by forcing or wedging the teeth apart usually for one week.Separation of teeth to create interproximal space is the first step in banding.[1]It is important to remember that, as separator placement is the done in the first appointment a painless procedure proves to be an important step in building trust with the patient. Orthodontic separators though used daily in orthodontic practice, is the least researched auxiliary till date.[2]

Brass wires, latex elasticsand elastomeric and spring-type steel separators are different types of separators frequently used in orthodontics. The ideal separator should give rapid and good separationwithout causing the patient discomfort or pain, thereby makingthe fitting of the band to the tooth. 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.[3]This can affect the treatment thus a protocol to know adequate time for separation needs to be determined. However, there are few studies that havethoroughly investigated the separating/tooth-moving effect fordifferent separators or how the patient has perceived the different separators.[4]

Adequate separation reducesphysical pains to the lowest possible degree, preventsinjury to the tooth structure from excess pressure, prevents injury of the soft tissue while forcing bandmaterial to place and reduces physical and mentaltensions of the patient by having the band materialconveniently carried to place.[5] The present study was conducted to compare three different separators in terms of pain and separation effect.

## MATERIALS & METHODS

The present study was conducted in the Post Graduate department of Orthodontics and Dentofacial Orthopaedics. It comprised of 102 subjects of age ranged 16- 24 years requiring orthodontic treatment of both genders. All were informed regarding the study and written consent was obtained. Ethical clearance was obtained prior to the study.

General information such as name, age, gender etc. was recorded. Three different separators such as Kesling separators, Elastomeric separator and brass wire were used. Kesling separators were placed using a light wire plier, elastomeric and brass wire were placed using a separator placing plier and Mathieu pliers. All subjects were assessed for 7 days to see amount of separation and pain intensity. The amount of separation was measured using leaf gauge after removing of separators by curved probe and light wire pliers. Results were tabulated and subjected to statistical analysis. P value less than 0.05 was considered significant.

## RESULTS

**Table I Distribution of subjects**

| Age groups (Years) | Number | Percentage |
|---|---|---|
| 16-18 | 50 | 49.0 |
| 19-21 | 32 | 31 |
| 22-24 | 20 | 19.6 |

Table I shows thatage group 16-1 8 years had 49.0%, 19-21 years had 31% and 22-24 years had 19.6% subjects.

**Table II Assessment of pain intensity on VAS scale in subjects**

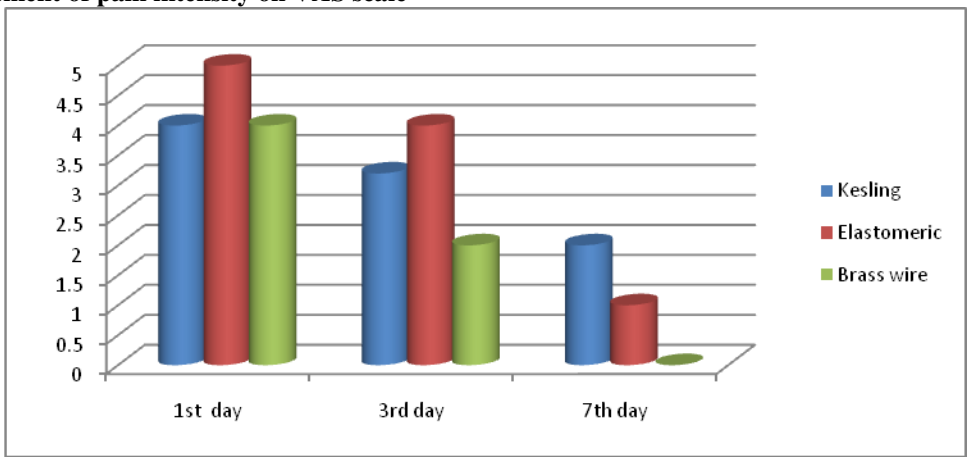
| Separators | 1st day | 3rd day | 7th day | P value |
|---|---|---|---|---|
| Kesling | 4 | 3.2 | 2 | 0.01 |
| Elastomeric | 5 | 4 | 1 | |
| Brass wire | 4 | 2 | 0 | |

**Table III Assessment of separation achieved at the removal of separators.**

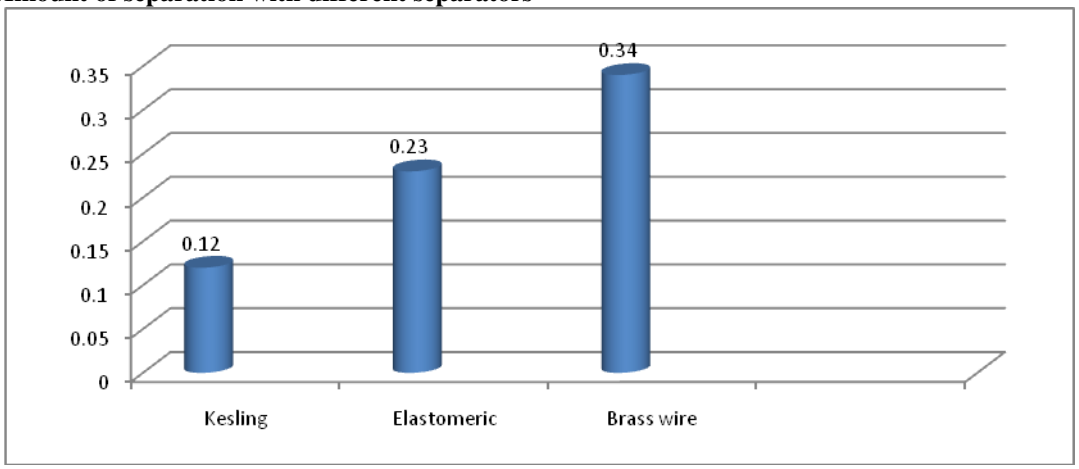
| Separators | 7th day |
|---|---|
| Kesling | 0.12 |
| Elastomeric | 0.23 |
| Brass wire | 0.34 |

Table II, Graph II shows that there was significant reduction in pain intensity on VAS scale recorded on 1st day, 3rd day and 7th day. The difference was significant (P< 0.01).

**Graph I: Assessment of pain intensity on VAS scale**




**Graph II: Amount of separation with different separators**




Graph II shows that maximum separation (0.34 mm) was achieved with brass wire followed by elastomeric (0.23 mm) and kesling (0.12 mm). The difference was significant (P< 0.05).

## DISCUSSION

Separators are used for creating space between molars to placement of orthodontic bands. They are also useful in eruption of partially impacted teeth especially second molars and make reproximation of adjacent teeth easier.Other useful uses are to secure lingual retainer wire, to correct ectopic first permanent molars and separation of teeth for stripping purpose.[6]The separator should provide adequate separation for properband fitting and yet comfortable to the patient. It should be easy to insert in tight contacts without breakage duringthe insertion. It should not dislodge while chewing food andremain till it is removed by the orthodontist. It should be autoclavable and hygienic; and should not make teethsensitive to band seating pressure.[7]

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.[8] The present study was conducted to compare three different separators in terms of pain and separation effect.

In present study age group 16-1 8 years had 50 (49.0%), 19-21 years had 31% and 22-24 years had 19.6% subjects. Sandhuet al[9] conducted a study on 50 subjects age ranges 17- 22 years of both genders.

We observed that there was significant reduction in pain intensity on VAS scale recorded on 1st day, 3rd day and 7th day. With Kesling separator, there was mean pain of 4 on 1st day, 3.2 on 3rd day and 2 on 7th day, with Elastomeric separator, there was mean pain of 5 on 1st day, 4 on 3rd day and 1 on 7th day, with brass wire separator, there was mean pain of 4 on 1st day, 2 on 3rd day and 0 on 7th day. Asari et al[10]evaluated the amount of separation produced by four types of orthodontic separators viz. the Elastomeric separator, Kesling separator, Kansal separator and Dumbbell separator. The patient was evaluated for 5 days for amount of separation. It was found that time taken for adequate separation was significant in all the 4 separators; dumbbell being the fastest followed by elastomeric separator. There was no significant difference between kesling and kansal separator in time taken to achieve adequate separation.

We observed that maximum separation (0.34 mm) was achieved with brass wire followed by elastomeric (0.23 mm) and Kesling (0.12 mm). Sandhu et al found that the mean separation was 0.32 mm for the spring-type, 0.41 mm for the elastomeric separators and 0.40 mm for brass wire separators. The Kesling springs were considered less painful than the elastomerics and brass wire separators. Both elastomeric and brass wire separatorsproduced more separation as compared to Kesling springs. A study conducted by Junejaet al[11]showed that the loss of “elastomeric” separator is significantly higher than the “kansal” separators.

## CONCLUSION

Brass wire shaped separators found to be effective in causing adequate separation. The pain intensity recorded was also less as compared to other separators.

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