

EZ Space Maintainer[®]

Dr. Enis Güray*

Ortho Technology, Inc. White Paper Report



Dr. Enis Güray is a published author, inventor, professor, orthodontist, and member of the Turkish Orthodontic Society, Société Française d'Orthopédie Dento-faciale, European Orthodontic Society, and the World Federation of Orthodontists.

Born in Istanbul, Turkey in 1958, Dr. Güray attended Saint Joseph French College from 1970-1977, then the University of Hacettepe, Faculty of Dentistry, Ankara (5 year curriculum) from 1977 – 1982. He was a DDS, Instructor from 1982-1986 at the Department of Orthodontics, University of Hacettepe (4 year program) then went on to obtain his PhD in 1986 for University of Hacettepe Thesis: *The Effects of Nasal Obstruction to Dento-facial Structures*. Dr. Güray has held a private practice while at the same time being a clinical instructor and lecturer at the University of Selçuk, Department of Orthodontics, Konya and later the University of Çukurova, Department of Orthodontics, Adana. He is the inventor of the Güray Instant Bite Raiser, EZ Space Maintainer®, and EZ Slider™.

Dr. Enis Güray
enisg@orthotechnology.com

What are Space Maintainers?

Space maintainers are used to maintain the spaces of lost teeth. Fixed or removable maintainers have been used since the beginning of the 20th century in the fields of orthodontics and pediatric dentistry (1).

Whether fixed or removable, there are certain prerequisites for all space maintainers:

1. They should maintain the mesio-distal dimension of the lost tooth.
2. They should be as simple and strong as possible.
3. They must be easily cleaned and not serve as traps for debris, which might enhance dental caries and soft tissue pathology.
4. Their construction must not prevent or restrict normal growth and developmental processes or interfere with such functions as mastication, speech, or deglutition.

Removable and Fixed Space Maintainers

A removable space maintainer known as Hawley Plates/Hawley Retainer requires good patient cooperation besides having application difficulties. The patient can lose them easily and they tend to break easily. It is difficult for the patient to adapt to the appliance in the beginning, and when not cleaned properly on a regular basis, it causes deterioration of the oral hygiene. They are expensive and difficult to manufacture. These appliances also have negative effects on speech and deglutition functions (2, 3, 4).

On the other hand, the fixed type space maintainers are commonly fixed to the molar bands and different diameters of wires are welded to these bands. They maintain the space by leaning against the adjacent tooth of the extraction sites. Their construction and application is relatively more difficult and more expensive than removable maintainers (5, 6). There are several fixed type space maintainers in the field. The fixed maintainer developed by Dr. Graber is the most widely known and preferred. The disadvantages of these appliances are the same as other fixed and removable maintainers—namely relatively long chair time and an impression followed by laboratory work (7).

However since they are becoming more frequently used by dentists, all kinds of maintainers should be fabricated more simply and easier to place in the space maintained area.

Different fixed and bonded space maintainers have been created using round wires, stainless steel strips and light polymerizing composites. (8,9,11-13).



An example of one of these appliances is the EZ Space Maintainer®** developed by Dr. Enis Güray (Picture 1).

Picture 1: Dr. Guray's EZ Space Maintainer®

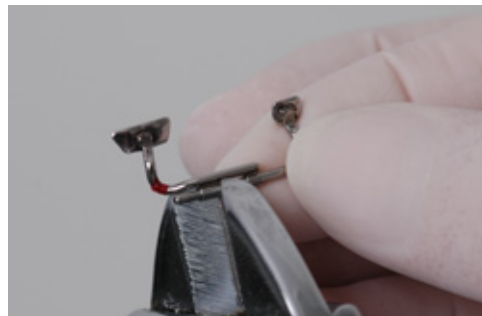
Application and Case Example

1. Choose the proper EZ Space Maintainer® by its color mark and remove the coil spring.
Green - Upper Right
Yellow - Upper Left
Red - Lower Right
White - Lower Left
(Picture 2)



Picture 2: Inside the box, the EZ Space Maintainer® has color marks indicating the different quadrants.

2. Adjust the length of the EZ Space Maintainer® by squeezing one of the tubes with pliers (Picture 3).



Picture 3: Adjusting the length of the EZ Space Maintainer®, by squeezing one of the tubes with a heavy cutter plier.

3. Check occlusally to ensure the bases adapt perfectly to the tooth surfaces. If necessary, additional adaptation could be performed with a three prong plier (Picture 4).



Picture 4: Both bases must adapt perfectly to the tooth surfaces. If necessary, adapt with a three prong plier.

4. Etch each tooth surface for one minute. Rinse and dry thoroughly. Bond the maintainer with a light cure adhesive (Pictures 5-7).



Picture 5: Etch each tooth surface for one minute. Rinse and dry thoroughly.

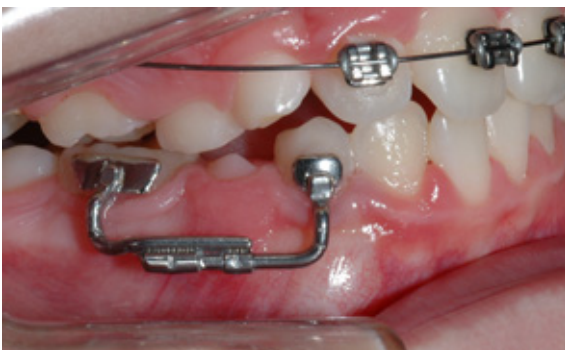


Picture 6: Bond the maintainer with a light cure adhesive.



Picture 7: Occlusal view.

5. The space is maintained during necessary time (Pictures 8, 9).



Picture 8: After 6 months, end of treatment. Second premolar erupting.



Picture 9: Occlusal view.

Clinical Evaluation

A few studies about direct bonded space maintainers were done in past years. But standardized and repeatable type direct bonded space maintainers were not used in these studies. For this reason a new direct bonded space maintainer was studied and evaluated clinically by Gulec S. (14). Conventional space maintainers were evaluated by Baroni et al. (15) and Rajab (16). They have reported median survival time for space maintainers as 20 and 18 months, respectively. The reported survival time for space maintainers were ranging between 5 months to 27 months (9,13,16,17). In the study done by Gulec S., space maintainers were followed-up for 20 months and EZ Space Maintainer® had presented 220 days (approximately 7 months) mean survival time. This result shows that the EZ Space Maintainer® has a satisfactory survival time. The failure rate of the EZ Space Maintainer® at the end of the six months was clearly low (4.8%) when compared with the results of direct bonded space maintainers' studies that performed by Swaine and Wright (9) (30%), by Artun and Marstrander (8) (19%) and by Santos et al. (13) (8.3%). Age was found to be a risk factor for the EZ Space Maintainer®. None of the maintainers failed in children over age 8. All failures were observed in children under age 8 and this result can be contributed to the moisture contamination which was not easy to prevent for children in this group (14).

Improvements in adhesive systems affected the orthodontic appliances and the space maintainers. Adhesives are the backbone of direct bonded space maintainer studies. However, adhesives are not the only factor in determining the success of the direct bonded space maintainers. The design of the space maintainers is important for toleration of occlusal forces and retention of the abutment teeth. Previous direct bonded space maintainers were designed with plain wires that had loops or grooves for bonding. EZ Space Maintainer® was designed for loading minimal occlusal forces independent of the appliance length. The pads could facilitate bonding with resin cement. This property was a critical factor for the success rate. In the study conducted by Gulec (14) of the adhesive failures, five of five occurred between enamel and adhesive resin. No adhesive resin loss was seen. In other words, failures did not occur between the appliance and the adhesive. This result proves that the mesh bonding bases of the appliance provide sufficient retention against the occlusal forces (14).

In the same study, following the SOHI norms, all patients showed acceptable oral hygiene practices. The first 7 days after the bonding of the appliance were the most important time intervals for the patient's adaptation and oral hygiene education.

Space analyses were also made by the same group, according to the method presented by Swaine and Wright (9). They also found that the extraction spaces were maintained successfully by the EZ Space Maintainer®. As a result, they declared that the main advantages of the EZ Space Maintainer® are saving time and ease of use.

Conclusion

We can conclude that Dr. Güray's EZ Space Maintainer® is more cost-effective and less time-consuming than traditional space maintainer appliances. This simple, reliable, and practical space maintainer requires no impressions, no laboratory construction, and can be directly bonded during one in-office visit. The EZ Space Maintainer® is more aesthetic and hygienic than traditional space maintainer appliances. Simple and easy to use, the EZ Space Maintainer® can be preferred as a fixed appliance providing easy maintenance of the mesio-distal dimension of any lost deciduous teeth.

REFERENCES:

1. Rock WP. UK National Clinical Guidelines in Paediatric Dentistry. Extraction of primary teeth -- balance and compensation. *Int J Paediatr Dent* 2002;12:151-3.
2. Hoffding J, Kisling E. Premature loss of primary teeth: part I, its overall effect on occlusion and space in the permanent dentition. *ASDC J Dent Child* 1978;45:279-83.
3. Hoffding J, Kisling E. Premature loss of primary teeth: part II, the specific effects on occlusion and space in the permanent dentition. *ASDC J Dent Child* 1978;45:284-7.
4. White GE. The management of the space from a prematurely lost second primary molar. *J Pedod* 1977;2:73-6.
5. Olsen NH. Space maintenance for children. *J Am Dent Assoc* 1952;46:386-92.
6. Laing E, Ashley P, Naini FB, Gill DS. Space maintenance. *Int J Paediatr Dent* 2009;19:155-62
7. Moyers RE. *Handbook of Orthodontics*. Year Book Medical Publishers Incorporated, Third edition, Chicago, 1983.
8. Artun J, Marstrander PB. Clinical efficiency of two different types of direct bonded space maintainers. *ASDC J Dent Child* 1983;50:197-204.
9. Swaine TJ, Wright GZ. Direct bonding applied to space maintenance. *ASDC J Dent Child* 1976;43:401-5.
10. Buonocore MG. A simple method of increasing the adhesion of acrylic filling materials to enamel surfaces. *J Dent Res* 1955;34:849-53.
11. Simonsen RJ. Space maintenance utilizing acid etch bonding. *Dent Surv* 1978;54(3):27-33.
12. Kochavi D, Stern N, Grajower R. A temporary space maintainer using acrylic resin teeth and a composite resin. *J Prosthet Dent* 1977;37:522-6.
13. Santos VL, Almeida MA, Mello HS, Keith O. Direct bonded space maintainers. *J Clin Pediatr Dent* 1993;17:221-5.
14. Güleç S. Evaluation of Clinical Success of New Type Fixed Space Maintainer. Unpublished Doctorate Thesis, Adana, 2011.
15. Baroni C, Franchini A, Rimondini L. Survival of different types of space maintainers. *Pediatr Dent* 1994;16:360-1.
16. Rajab LD. Clinical performance and survival of space maintainers: evaluation over a period of 5 years. *ASDC J Dent Child* 2002;69:156-60, 24.
17. Tulunoglu O, Ulusu T, Genc Y. An evaluation of survival of space maintainers: a six-year follow-up study. *J Contemp Dent Pract* 2005;6:74-84.

*Dr. Güray is a lecturer and clinical instructor at the Department of Orthodontics, Ercites University, Kayseri and in the private practice at Cinnah Str. 37/3 Cankaya Ankara Turkey.

**Ortho Technology, Inc., Tampa, Florida, USA.

US Patent No. 6,726,473 B1 and EP 1 217 965 B1

© 2012 Ortho Technology, Inc. EZ Space Maintainer is a registered trademark of Ortho Technology.