How to avoid extractions when treating malocclusions using MRC’s Bent Wire System and Trainer System for arch development

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Abstract

Maxillary and mandibular expansion has become a more popular treatment to avoid extractions during orthodontic treatment. Although controversy has persisted over the stability of expansion techniques, there is an increasing trend toward “non-extraction.” This paper describes a novel method to produce expansion of the dental arches, and at the same time, to treat muscular dysfunctions that may be the etiologic factor of the malocclusion. The system has been developed by Myofunctional Research Search Co. (MRC), Queensland, Australia, as a simpler method of phase one expansion, which may produce improved stability. The system is limited to situations in which an inter-maxillary relationship is not possible because of both orofacial problems or a Class I skeletal discrepancy. The following two cases show how the system is used.
consulted because of a crowded dentition involving unusually small incisors with a midline shift of 8 mm and lost “c” space on the lower left side. The parents requested that the treatment be non-extraction, although they had previously been advised that future orthodontic treatment might require this option (Fig. 6). This case was classified as Class I with normal slight overjet and with normal overbite. No skeletal restriction was found on the cephalometric measurements and the mold and cost models reported a lack of arch development. This case was diagnosed as a Class I malocclusion with underdevelopment of both dental arches. Midline shift was primarily as a result of the lost lower “c” space. Soft-tissue analysis showed a mouth-open posture and hyperactive peri-oral musculature. It was considered the myofunctional habits were a contributing factor to the malocclusion and, thus, a suitable case for the BWS and Trainer combination prior to fixed appliances once secondary dentition development was fully erupted.

The plan of treatment involved a first phase with a BWS for the upper arch combined with an i-2 Trainer—“n” for non-core wire fixed appliances—for increased flexibility to work at your own pace through the material from one appliance, the i-2 Trainer, a pre-fabricated archwires and other acrylic expanders. The i-2 Trainer initially for four months (as mentioned earlier, this system is non-extraction) followed cannot be ignored and is achieved quicker results following archwire fixed appliances. This second phase of treatment did not require the BWS on the lower arch as arch development during the treatment period sufficiently opened the space for the lower permanent canine. The lower anterior dentition did not require the use of fixed appliances (Fig. 7). Thus, this case was treated in a 2-year period, required minimal chair side time and a difficult extraction case was converted to a simple, non-extraction case.

Case No. 2

This 12-year-old female patient consulted because of very underdeveloped maxillary arch form and ectopic erupting canines (Fig. 8). This is far from an ideal age for the achievement of non-extraction treatment; however, the parent insisted that the case was attempted non-extraction. The lower anterior teeth were also considerably crowded, and it would regularly be justified in extracting the first four premolars and going into upper and lower straight fixed appliances. It could be argued that treating non-extraction will prolong the treatment and certainly incur greater expense on the parent. However, there is a growing demand for fixed appliances by parents who have had orthodontics in the past to avoid this approach for their children. Therefore, the BWS Orthodontic System can be a beneficial technique that the orthodontists can use in these exceptional cases.

Treatment was similar to case 1. An upper BWS was fitted and combined with the use of the i-2 Trainer at initial position for four months, after which time the BWS was removed, leaving the nodal bands in place. The i-2 Trainer was introduced at this stage for a further three months to maintain the expansion prior to a second phase of treatment using the BWS and i2n Trainer for three months (as mentioned earlier, this system is non-extraction). This allows the dentition to “catch up” and prevents excessive tooth mobility. It is thought that much of the expansion achieved by this system is due to the mandibular rather than splaying, with a rapid maxillary expander and other acrylic expanders. Also, there is more development of the tongue position and normal arch development, which is an effect previously found in the research on the Trainer. The difficulty in cases like this, requiring large amounts of expansion to achieve a non-extraction result, is a tendency to create an open bite. Although this occurs to some extent, the BWS Orthodontic System does not open the bite as much as more conventional techniques because the tongue position is favorably altered by use of the Trainer. This conjecture may require further investigation to fully verify.

Once again, spontaneous alignment of the lower anterior dentition has occurred without the need for the BWS on the lower arch. This effect is not just restricted to these two cases but is a routine observation of the BWS Orthodontic System. This case also illustrates the stability achieved in the lower dentition as no retainers were used apart from night use of the Trainer. Although this patient is not at the upper echelon of dental medicine, but also presents a regional outlook in terms of perspective and subject matter.

Conclusions

Maxillary and mandibular expansion has been shown to be an excellent alternative to increase the arch perimeter and, thus, to avoid the need for extractions to properly align teeth. This paper has presented two cases treated using the BWS Orthodontic System, which involves the combination of two appliance systems: the Trainer, a pre-fabricated functional appliance; and the BWS. Both appliances, Trainer and BWS, have been used in order to get the results reported in this paper. The BWS Orthodontic System showed in these two cases and in many cases treated by the authors is an excellent means to produce arch development in both upper and lower dental arches in a short time. The effect of the BWS Orthodontic System on arch development does not change the inter-maxillary relationship when a Class I occlusion exists at the beginning of treatment.

However, when a Class II malocclusion associated to a crowded dentition is present the BWS Orthodontic System produces arch development and, at the same time, the mandibular relocation of the lower anterior dentition is achieved non-extraction with minimal use of multi-bracket systems.

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effect is produced by the Trainer (Usmez, 2004; Ramírez-Yañez, 2003; Quadrelli, 2002), which treats the distal position of the mandible. Additionally, the BWS Orthodontic System has shown to improve the overjet and overbite but to maintain them when they are correct at the beginning of treatment. This system treats muscular dysfunctions that may be the cause of crowding and malocclusion and may cause relapse after treatment is finished. Thus, the BWS Orthodontic System may be proposed as an excellent alternative form of treatment in those cases where arch development is required to align teeth, patients want to minimize or even avoid brackets and extractions, the mandible needs to be relocated, soft tissue dysfunction is present and treatment needs to be performed in a reasonable period of time.

References

About the Authors
Chris Farrell, DDS, graduated from Sydney University in 1971 with a comprehensive knowledge of traditional orthodontics using the Begg technique. Through clinical experience, he took an interest in TMJ/TMD disorder and, after further research, Farrell discovered that the etiology of malocclusion and TMD disorder was myofunctional, contradicting the current views of his profession. Farrell founded Myofunctional Research Co. (MRC) in 1989 and has become the leading designer of intra-oral appliances for orthodontics, TMJ and sports mouthguards.

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