Twin Block : A Boon For Mixed Dentition Cases

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Abstract

After a century of development of functional technique it is surprising that the forces of occlusion have not been used to any significant extent as a functional mechanism to correct malocclusion. The twin block is a natural progression in the evolution of functional appliance therapy as compared to earlier bulky mono-block. Improvements in the design of functional appliances have led to more consistent results in functional orthopedic treatment. A significant advancement in the introduction of appliances for full time wear, during eating also in order to maximize the functional forces in the developing dentition. The present article gives a brief view of most widely used functional appliance.

Keywords : Twin Block, Class II.

Introduction

William J. Clark in 1977 introduced twin block appliance for the treatment of non compliant class-II patients. Twin Block appliance is a removable functional appliance which is made up of two components, an upper and lower, which work together to posture to lower jaw forward. This frees up the otherwise "lock-in" lower jaw to grow to it's full potential. The upper and sometimes lower also has an expansion screw to widen the upper arch.

Twin Blocks are simple bite-blocks which effectively modify the occlusal inclined plane using upper and lower bite blocks which engage on occlusal inclined plane. Twin block appliances achieve rapid functional correction of malocclusion by transmission of favorable occlusal forces to occlusal inclined planes covering the posterior teeth.

Mechanism

The Twin block works on the philosophy of occlusal inclined planes and use of masticatory force throughout the day. The Twin Block Technique has two stages-

1. Active Phase in which Posterior inclined planes are used to correct the malocclusion by functional mandibular protrusion, and to adjust the vertical dimension.
2. Support Phase in which An anterior inclined plane is used to retain the corrected incisor relationship until the buccal segment occlusion is fully established.

The cant of the Occlusal Plane

It is the fundamental functional mechanism of the natural dentition. In normal development, inclined cuspal planes plays an important part in determining the relationship of the teeth as they erupt into occlusion. Occlusal forces transmitted through the dentition provide a constant proprioceptive stimulus to influence rate of growth and adaptation of the trabecular structure of the supporting bone. The proprioceptive sensory feedback mechanism controls muscular activity and provides a functional stimulus to the full expression of mandibular growth. When a distal occlusion develops, the occlusion of the teeth represents a servo-mechanism, which locks the mandible in a distally occluding functional position.

Technique of Twin Blocks

Twin Blocks correct the maxillo-mandibular relationship by functional mandibular displacement and achieve rapid functional correction of malocclusion by modifying the occlusal inclined plane, to guide the mandible forward into correct occlusion. The forces of occlusion are used to correct the malocclusion. With twin blocks, full functional correction of occlusal relationships can be achieved in most cases without the addition of any orthopedic or traction forces and also patients can eat comfortably with the appliances in place. The bite blocks (upper & lower) interlock at a 70° angle, usually covering the upper and lower teeth in the buccal segments. By causing a functional mandibular displacement, the interlocking occlusal bite blocks alter the distribution of occlusal forces acting on the dentition to correct a malocclusion during the development of the dentition.

Muscle behavior is immediately influenced by placing inclined planes between the teeth. The muscles of mastication must adapt to the altered balance of occlusal forces by guiding the mandible into protrusive function. This results in rapid soft tissue adaptation to achieve a new position of equilibrium in muscle behavior. This produces rapid improvements in facial appearance during the first few weeks and months of treatment.

Bite Registration

In Class II Division I malocclusion, a protrusive bite is registered to reduce the overjet and the distal occlusion by up to 10 mm on initial activation of twin blocks, depending on the freedom of movement in protrusive function. This degree of activation allows an overjet of up to 10 mm to be corrected without further activation of the twin blocks. Larger overjet invariably require partial correction, followed by reactivation after the initial correction is complete.

The amount of vertical activation is determined by two factors. First, there must be adequate vertical clearance between the cusps of the upper and lower first premolars, or deciduous molars to accommodate blocks of sufficient thickness to activate the appliance. The blocks are normally 5 to 6 mm thick between the first premolars.

Secondly, the vertical activation must open the bite beyond the free-way space to ensure that the patient cannot drop the mandible into rest position and negate the proprioceptive functional response of the inclined planes. For the same reason, opening the bite beyond the free-way space may be an important factor in ensuring that the appliance is active when the patient is asleep

Retention

During the retention period, appliance wear can be gradually reduced to night time wear.

1. Vertical Activation-Treatment of Deep Overbite : Vertical control in treatment of deep overbite associated with a brachyfacial growth pattern which aims to increase lower facial height by correcting the incisors to an edge-to-edge relationship, while at the same time, adjusting the height of the upper bite-block in the molar region to encourage molar eruption. The aim is to increase the vertical dimension thus increasing lower facial height. Overbite reduction is achieved by trimming the occlusal cover on the upper twin block occluso-distally to encourage eruption of the lower molars. It is important that the inclined plane remains intact, however, in order to maintain the activation to propel the mandible downwards and forwards.

2. Vertical Activation-Treatment of Reduced Overbite : It is essential that all posterior teeth are in occlusal contact with the opposing bite blocks to prevent over-eruption, which would increase the anterior open bite and accentuate the vertical growth tendency.

Discussion

When treatment is done in a mixed dentition stage, functional appliances are said to bring about marked improvement in the skeletal relationships, while these functional appliances affect the hard tissues, they also produce a marked improvement in the soft tissue facial balance and harmony. Treatment with twin block leads to appreciable decrease in soft tissue facial convexity and no restraining effect on maxilla.

Conclusion

Patient co-operation is a very important factor during treatment with removable functional appliance if overcome; appliance can be equally efficient as fixed functional appliance.

Twin Block has become one of the most widely used functional appliance in the correction of Class- II malocclusion and Class III, due to its easy adaptability, acceptability, versatility, and ease of incremental mandibular advancement without changing the appliance.

References

For a complete list of references are available on request. Please mail us editor@healtalkht.com