Gentle-Jumper- Non-compliance Class II corrector

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Abstract
The present protocol for the correction of Class II malocclusion with mandibular retrognathism is by using the fixed functional appliances. This article includes a case treated with Gentle Jumper—a flexible fixed functional appliance. A pre-pubertal patient with class II malocclusion with 70% deep bite was treated with Gentle Jumper along with fixed appliance (MBT-0.022" slot). Deep bite has been treated with extrusion of posteriors and proclination of anteriors. It resulted in the favorable skeletal and dentoalveolar changes in the mandible. There was slight proclination of lower incisors. Good soft tissue changes were noted. Gentle Jumper is an efficient class II corrector in pre-pubertal period, It promotes patient compliance with very minimal breakages.

Key words: Gentle Jumper Deep bite, Class II malocclusion

Introduction
Fixed functional appliances are non-compliance Class II corrector. As an adjunct to fixed appliance therapy, the Gentle Jumper¹ provides an opportunity to minimize extractions and to reduce or eliminate headgear. When activated by 4 mm, the Jasper Jumper will exert 360 grams of force. By comparison, at the same amount of deflection, the Gentle Jumper exerts just 75 grams of force, which is better suited to mixed dentition cases.

The Gentle Jumper provides the following advantages:
1. They are fixed so patient cooperation is assured.
2. They work along the growth or Y axis, thus they properly advance the mandible rather than retracting the maxilla.
3. Because of the ball joint, the Jumpers swivel allowing normal functions such as eating and tooth brushing.
4. They are safe. No extra-oral traction is involved.
5. They are cosmetic.
6. They can be used for Class II or Class III corrections and can apply different forces on each side of the jaw for cross bites.

7. Forces are adjustable and measurable.

**Measuring for correct size:**
To get the right length, have patients bite in their retruded or centric bite and measure from the mesial of the headgear tube to the distal of the lower ball stop, then add 12 mm (4 mm for the tube, 4 mm of free play, and 4 mm of built-in activation). Some patients may require different length Jumpers on the left or right side.

**Sectional Wire for main arch wire attachment**
A sectional wire has been specially designed for Gentle Jumper use. The uniqueness of this wire lies in the anterior loop design and its attachment to the main arch wire. This loop design allows for attachment to the main arch from lingual to buccal as opposed to the conventional wrap around from buccal to lingual. The advantages are lower profile and minimal patient irritation in addition to trouble free action and the virtual impossibility of displacement from the main arch.

**The hypothesized mechanism of Class II correction with Gentle jumper include:**
- Basal restraint of the maxilla.
- Dento alveolar retraction of the maxillary dentition.
- Dento alveolar protraction of the mandibular dentition.
- Increased growth at the mandibular condyle.
- Downward/forward gleno id fossa remodeling
- Lateral expansion of the maxillary molars.

**Treatment Objectives**
- Correction of skeletal class II
- Correction of class II canine bilaterally and class II molar relation on right side
- Relieving of upper and lower anterior crowding
- To correct the midline discrepancy
- To correct the deep curve of spee
- To achieve ideal overjet/overbite
- Correction of convex profile

**Case Report**
**Diagnosis**
A 14 year old female reported with the chief complaint of irregularly placed upper and lower front teeth. She had skeletal and dental class II malocclusion with upper and lower anterior crowding. She had a convex profile, decreased lower facial height, deep mentolabial sulcus. (Fig: 1) Model analysis revealed crowding of 2mm in the upper arch and 4mm in the lower arch, an overjet of 6 mm and overbite of 5 mm (70%).lower midline is deviated towards right side by 1mm. 4mm of curve of spee present in the lower arch. (Fig: 2)

**Treatment Plan**
Non-extraction was planned because space requirement was minimal. Fixed functional (Gentle jumper) was planned to correct skeletal and dental class II malocclusion. As the objective was to correct both skeletal and dental relation flexible appliance with light force was selected. Placement of fixed functional bilaterally was planned so that we can achieve Class I canine relation and midline match.

**Treatment Progress**
Initial alignment and leveling was done with 0.016” NiTi followed by 0.019”×0.025” NiTi. After initial alignment & leveling, 0.019”×0.025” stainless steel was placed in both the arch. Additional 10° labial root torque was added in the anterior segment of the lower archwire to counteract the lower incisor proclination. Upper and lower arch consolidation was done. Sectional 0.017”×0.025” stainless steel wire was placed in auxiliary lower tube. Gentle jumper was placed and continued for 6 months. (Fig: 4, 5) After removal of fixed functional appliance Class II elastics were continued for 2 month for retention of all the correction. (Fig: 6)

**Discussion**
The Gentle jumper is flexible fixed functional appliance, attached to maxillary and mandibular arch to produce rapid interarch changes either through “head-gear like” or “activator – like” forces or a combination of both. This appliances use pushing mechanics with intrusive force vectors as side effects, which are beneficial since intrusion of lower incisors is usually necessary during the correction of Class II malocclusions. The force modules are available in seven lengths ranging from 26...
to 38 mm in 2 mm increment. They are designed to use on either side of dental arch. When the force module is straight, it remains passive. As the teeth come into occlusion, the force module is curved axially, and produces light force. This kinetic energy developed is converted to potential energy to be used for the various clinical effects. To enhance the anchorage, transpalatal arch is used in maxillary dentition and lingual arch in mandibular dentition if needed. The spring mechanism is a modification of the original bite – jumping mechanism of appliance. The flexible spring module provides greater freedom of mandibular movement. It works best with MBT 0.022” slot prescription because this bracket system have -6° torque in the lower anterior region and additional -10° labial root torque given in lower archwire helps to counteract the proclining effect on the lower anterior teeth.

Conclusion
Treatment of Class II malocclusion in is always challenging. Applying sound biomechanical principles to execute the mechanics plan is the surest way to achieve predictable results with minimal side effects. Gentle jumper is an efficient class II corrector in patients with retruded mandible producing favorable skeletal, dentoalveolar and soft tissues changes. It is a compliance free appliance providing 24×7 stimulus. It provides an alternative to other fixed functional class II appliance systems. Together with dental effects, the mandibular displacement achieved leads to an improvement in sagittal discrepancy.

References
Figure 1 – Pre-treatment extraoral photographs

Figure 2: Pre-treatment extraoral photographs

Fig 3- With fixed functional appliance (Gentle-Jumper) -0.019x0.025 SS arch wire
Figure 4: Post-functional extraoral photographs

Figure 5: Post-functional intraoral photographs

Figure 6: Post-functional photographs with Class II elastics for retention