

## **Treating completely blocked canines and full step Class II malocclusion**

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This case is a reminder that orthodontists should not simply consider the aspect of teeth and the easiest treatment result. One must look at the patient's unique facial esthetics and determine the appropriate use of extraction therapy.

*Dr. Todd Bovenizer presents a full step Class II malocclusion with blocked-out canines utilizing light open coil springs and elastics with the Damon™ System's Damon™ Q brackets*

Evaluation and treatment of Class II malocclusion can present a challenge to the practitioner. One must consider the facial ramifications, as well as skeletal and dental

characteristics. This particular case presented with severe crowding that further complicated the diagnosis and treatment planning. This case exemplifies a challenge in multiple planes of space, A-P, transverse, and vertical.

The following case will illustrate how I implemented the combination of variable torques of Damon™ Q, with NiTi coil spring, and early elastic therapy to avoid extraction of maxillary premolars. The ending result was a well-developed transverse arch with ideal incisal inclination.

### **Diagnosis**

A 13.6-year-old, healthy adolescent male with no significant dental history presented Class I skeletal and full step Class II with severe maxillary crowding, including 100% blocked out cuspids. He presented with a reasonably straight profile with a retruded, flat maxillary lip. In fact the lower lip protruded beyond the maxillary lipline. This therefore led to a slight obtuse nasolabial angle. Looking at the patient's profile, I felt that extracting teeth could negatively impact his facial features over time, and his parents wanted to avoid extracting teeth if possible. Using passive self-ligation (the Damon System) gives me the tools necessary to treat this non-extraction, with simple predictable treatment mechanics that become reproducible with other adolescents with similar malocclusions.

### **Treatment plan**

In assessing the case, I wanted to enhance the profile and employed facial-driven treatment planning. Patient had upright maxillary incisors and a retrusive maxillary lip line. I focused on the patients' facial esthetics today and considered the future growth throughout life. As most clinicians would agree, a non-extraction treatment approach must be considered with extreme care in these case selections. To do so, I

selected maxillary and mandibular Damon Q low torque brackets on U/L 2-2 and standard torque on the U/L 3's. I have been using the Damon™ System for 7 years and have depended on the passive self-ligating appliance with high-technology archwires to treat these difficult cases — where multiple planes of space are being developed at once.

NiTi open coil springs were utilized at ½ bracket activation to open space for the maxillary canines. Additionally, it was decided to depend on light short Class II elastics to aid in the correction of Class II and also help with anchoring the maxillary arch. The maxillary incisors were very upright, and the transverse needed to be developed. The patient's maxillary molars were also rotated along the palatal root. The lack of binding aided my transverse adaptation of the molars and allowed me to open up space for the maxillary canines while at the same time maintaining the axial inclination of the maxillary incisors. The incisors remained upright, which is completely stunning.

## Treatment progress



Figure 1: Initial records

To start treatment, an in-office indirect bonding system was used to bond the Damon Q low torque appliances. I used NiTi open coil spring upper 4-2 bilaterally to open space very gently on round CuNiTi wires. From there, I employed short Class II elastics U4-L6 bilaterally, 3/16" 2 oz. for full-time wear. It was decided to stay in round CuNiTi for approximately 1 year on the maxillary arch with gentle activation of the open coil spring. 3/16" 2 oz. Quail elastics were used the entire time to keep forces light. During the next 11 months, there were five treatment appointments where I paid very close attention to the transverse development and the axial inclination of the maxillary

incisors which as I mentioned were one of the primary focuses of every appointment to ensure that proper angulation/inclination was maintained and in proper alignment with his facial features.

At 14 months, I used a soft tissue diode laser to uncover the maxillary canines. At this point, the patient was in a Class I buccal segment with adequate space to incorporate these teeth into the arch. The axial inclination of the maxillary incisors was near ideal, and we were still using round wire in the maxillary arch. At this time, the buccal segments were Class I, and case management was well under control. In fact, it only took three more appointments to remove all appliances.

As I mentioned, roughly 8 months into treatment, the buccal segments were approximately Class I with only 2 oz. shorty elastic wear. Of extreme importance, and I have witnessed it case after case and with careful diagnosis, bracket placement and selection is crucial to ensure meticulous control of the case. In this case, the first year was spent in round NiTi wire without excessive incisal proclination (Figure 1).

## Finishing

As most clinicians are aware, to treat a mutually protected socked-in occlusion from a full cusp start is very tough. With careful planning and light activation of open coil springs and short Class II elastics, finishing was controlled and easy to provide. After roughly 12 months, the case was a socked-in Class I. Therefore, the patient spent the next 11 months in rectangular NiTi and finishing wires, 19 x 25 TMA and 16 x 25 SS on lower. Archforms were periodically checked on the arch symmetry guide manufactured for Damon archforms to protect the beautifully created Damon archform.

## Results



Figure 2: Progress pan

After 23 months of treatment, non-extraction therapy was obtained. The patient completed treatment with more uprighted buccal segments and transverse development influencing a broad smile. Additionally, we achieved an improvement on profile with lip support and nasiolabial angle. The final images display a very nice inter-incisal angle, obtained with appropriate axial inclination of the maxillary incisor.



Figure 3: Final records

Since using the Damon System, I feel I can treat complex cases more efficiently and differently than with traditional systems. In this particular case, I was able to take advantage of the low force, low friction environment to begin opening space at bonding. There was 100% space loss for these teeth, yet we were able to develop the transverse and create room for the cuspids. Not only was room created, but the Class II was corrected at the same time — without flaring the maxillary incisors. Previously, this patient would have required a maxillary expander then braces to hopefully open space, often resulting in flaring the incisors.

This case is a reminder that orthodontists should not simply consider the aspect of teeth and the easiest treatment result. One must look at the patient's unique facial esthetics and determine the appropriate use of extraction therapy. Each treatment plan should strategically cater to the individual patient, as some begin with incisal protrusion, and therefore lip imbalance, to warrant extraction therapy.

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