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Orthodontic space closure has always been a challenge for the orthodontist. Space closure using fixed appliances is usually accomplished using a variety of methods. In the standard edgewise technique, space closure was accomplished using the closing loop archwires, which were activated about 1mm/month. With the preadjusted appliance, sliding mechanics is the most preferred method of closing extraction spaces\(^1\). For this there are several methods of applying forces by the usage of elastic modules, elastic chains, Niti coil springs, Pletcher coil springs etc., which produce a force of 100-200 gms. However, the potential disadvantage of using an elastic force system is the significant force decay over time. All these have shown to produce space closure of the order of 0.5-1 mm/month.

In 2005, Dr. Schuetz\(^2\) proposed an alternative method of space closure using the Hycon appliance. It consists of a retraction screw which allows precise closing activation at a relatively high force level of about 410 gms but over a short distance allowing a reactivation more frequently for a more physiological space closure.
The Hycon device consists of a bolt and nut combination in which the nut is mounted on a support wire. The Hycon device is available with 2 support wire dimensions. Space closure is initiated after leveling and alignment have been completed and rectangular archwires have been placed. Prior to its insertion in the mouth, a soft ligature wire is twisted around the neck of the bolt and bent 90°.

The support wire is inserted into the auxiliary tube on the molar band from the mesial side. The Hycon is then secured by bending the support wire back. The ligature wire that was initially twisted around the neck of the bolt is then connected on the mesial side of the extraction space to a bracket hook or kobayashi hook to move a single tooth or to an anterior archwire hook to move an entire segment.

Using the small screwdriver, the patient activates the Hycon by turning the bolt clockwise until the slack is taken out of the connecting wire and the patient begins to feel slight tension. From this point the patient activates the appliance with one full 360 degree turn in the same direction. This will close the space a maximum of 0.35mm. The Hycon device can be reactivated one full turn twice a week which will provide approximately 1-2mm of space closure per month.

Case 1(Fig 1-9)
A 14 year old post-pubertal female presented with forwardly placed upper and lower anterior teeth. Clinical examination revealed a class I skeletal and dental relationship with a dento-alveolar bimaxillary protrusion, with 2mm of lower anterior crowding; incompetent lips and a convex profile. To achieve lip competency and reduce the convexity of the profile an extraction line of treatment involving first bicuspids in the upper and lower arch was carried out. All the teeth in both arches were bonded with 0.022” MBT brackets. Leveling and alignment was completed. A Hycon device was used for space closure in both upper and lower arches.
Fig. 1 Pre treatment photographs

Fig 2. Pre treatment
Fig 3. Pre treatment OPG

Fig 4. Pre treatment lateral cephalograph
Fig 5. Space closure using Hycon device

Fig 6. Post space closure (present stage)

Fig 7. Post space closure
Fig 8. Post space closure OPG

Fig 9 post space closure lateral cephalograph
Case 2(Fig 10-17)

A 15 year old post-pubertal female presented with a skeletal and dental class I relationship, with proclined and crowded upper and lower teeth, palatally impacted 13, with acute nasolabial angle, convex profile and incompetent lips. All the teeth were bonded with 0.022” MBT appliance. After leveling and alignment was completed 13 was deimpacted and brought into the arch. Four second premolars were extracted and the Hycon device was placed to allow efficient space closure.

Fig 10. Pretreatment extraoral photos

Fig 11. Pretreatment
Fig 12. Pretreatment X-rays
Fig 13. Space closure using Hycon device
Fig 14. Post space closure photos

Fig 15. Post space closure OPG
Fig 16. Post space closure lateral cephalograph

Fig 17. Superimposition - **Na-Ba at CC**
Conclusion

As these cases demonstrate, the Hycon device causes rapid and précise tooth movement to bring about space closure at a fairly high force level, without decreasing blood supply to the surrounding periodontal structures.

References