Cow-Catcher® for Extrusion movement

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eCligner® Treatment for Extrusion movement

eCligner® is digital made removable Clear Aligner by 3D-CAD/CAM-System to treat orthodontic patient and to pursue esthetic dentistry without bonding resin or metallic braces in patient mouth.

Finishing & detailing is one of the important key to accomplish orthodontist approved result. For ideal detailing and finishing purposes, up & down elastic technique has been applied to establish cuspal interdigitation in fixed appliance treatment with bracket and wires. Tooth positioner has been applied to achieve intermaxillary interdigitation, however, it has a difficulty to encourage patient compliance during treatment period.

eCligner® is able to achieve ideal intercuspal digitation through special metal free appliance, Cow-catch eCligner®, which consists of transparent buttons and elastics with aligner, to generate extrusion mechanic comfortably and efficiently even though it is removable orthodontic aligner. (Pic. 1-3)

Cow-catch eCligner®

To treat local or general open-bite situation, digital setup data(treatment objective) is constructed by eCligner® 3D CAD CAM software to define the visual treatment objective(programmed finishing). (Pic. 4)

When printed set-up model is ready, Cow-catch eCligner® is completed by vacuum former (TuPan Armoured, Invisi-Tech, Korea). Cow-catch eCligner® margin is trimmed to allow extrusion movement driven by elastic engagement. (Pic. 5)

Applications

- Finishing & detailing (Pic. 6-10)
- Open-bite treatment (Pic. 11-14)
- Functional intercuspal relationship (Pic. 15-17)
- Midline correction (to reference article (15))

Mechanic

Extrusion mechanic

Extrusive orthodontic movement is generated by up & down elastics which is engaged among multi buttons. Bondable transparent button is placed on target tooth by adhesives(available for general purpose bonding materials), and buttons on eCligner® is constructed by heat forming pliers (CA 1,2, Invisi-Tech, Korea). Elastic engagement generates 100~150 gr. to react extrusion tooth movement by 3/16 or 1/4 inch size intraoral elastic material, which is optimal amount of force to conduct biologically acceptable orthodontic movement with tipping control simultaneously.

Extrusion movement is ceased when target tooth contacts to aligner surface, that is, ‘Fail Safe’ in orthodontic term, not to allow excessive tooth movement even on continuing elastic force. Programmed finishing is possible in orthodontic case by design the set-up model.
Serial clinical progress to apply Cow-catch eCligner®:
1. Take an impression open-bite case to make stone model.
2. It requires to convert into digital data from stone model by 3D scanner.
3. Printed set-up model by 3D printer.
4. Cow-catch eCligner® is manufactured by vacuum former with 0.75 mm TuPan foil. Notice the trimmed margin allows a space for bondable transparent buttons, and lower buttons will react as anchorage to following elastic engagement.
5. Bondable transparent buttons are placed on target tooth which shall be extruded.
6. Upon the instruction, Cow-catch eCligner® is acting in patient mouth. Esteemed treatment time with Cow-catch eCligner® is one month in this case.
data according to doctors desire and philosophy about ideal occlusion. Basically, Cow-catch eCligner® is recommended to wear only sleeping time (8~10 hours) to perform extrusion movement. (Pic. 18-21)

Clinical Process

Upon instruction sticker attached on eCligner® container box, bond the buttons on target teeth at first, and then apply Cow-catch eCligner® with elastics until intermaxillary interdigitation completed. In general, it takes about one month to treat less than 2~3 mm open bite case. Elastic should be changed every day to reactivate extrusion force periodically. More than 5 mm open-bite case, clinician may apply daytime Cow-catch eCligner® for 17 hours wear to keep continuing extrusion force.
Abb. 11
Open-bite case female patient.

Abb. 12
Cow-catch eCligner® was applied with buttons and elastics in sleep time.

Abb. 13
After 2 months, anterior seating has been completed by Cow-catch eCligner®.

Abb. 14
Case was terminated by button removal and space closing.

Abb. 15
Young adolescent patient had a relapse as shown, buccal open-bite after fixed orthodontic treatment 3 years ago.

Abb. 16
Cow-catch eCligner® was applied to improve masticatory function and occlusion stability.
After Cow-catch eCligner® only in sleep time use for 3 months, buccal occlusion has been improved.

Structure of Cow-catch eCligner® has ‘Fail safe’ function in it. Before use, whole concept and design was determined to achieve the exact amount of extrusion and final occlusion status. Excessive extrusion movement, arbitrary or random occlusal seating is not allowed by Cow-catch eCligner®. The procedure to make set-up data for Cow-catch eCligner® requires scientific and orthodontic based best result.

Meanwhile Cow-catch eCligner® application, tipping control (torque change) is enable to be achieved simultaneously with extrusion movement.

Clear button (bondable) is attached with adhesives in general procedure.

Anchorage buttons are made by thermoforming pliers (CA 1,2, Invisi-Tech, Korea).
According to instruction, clinicians is able to apply Cow-catch eCligner® to the patient.

Included elastic holder(eCligner® remover) is helpful to apply the elastics by patient.
When occlusion settles down completely, bonded buttons should be removed carefully with orthodontic cutter and polished by rubber cup in general manner. After the occlusion reestablished, it requires one or two more steps eCligner® to close a little spacing in dental arch to the final treatment stage. (Pic-22-27)

**Check point**

Cow-catch eCligner® performs extrusion movement quickly, thus it may irritates patient moderate pain during elastic engagement time. In this case, recommend the patient just hold elastic using half an hour and restart again to use Cow-catch eCligner®. Warm mouth gargle may help to release the intermittent pain from continuing elastic force.

Follow up check is reasonable to recall patient every 3 weeks to confirm the extrusion tooth movement and keep watching patient compliance. When a part of margin interrupts target tooth movement, clinician should trim the margin to avoid a stuck on pathway.

To prevent a relapse after Cow-catch eCligner® application, put clips as retention form onto cervical point in eCligner® by using CA 3 piers(Invisi-Tech, Korea) (Pic. 28,29)

**Clinical cases**

**Finishing & Detailing case**

A: Anterior open-bite (Pic. 30)
B: For cuspid function (Pic-31-33)

**Anterior open-bite (Pic-34-38)**

**Conclusion**

Longterm study and experiences from Cow-catch eCligner® applications, finishing & detailing has been achieved effectively and successfully in a short period without failure or trouble in tooth vitality. Intermaxillary occlusion has been established by close digitation that was driven in less side effect. (Pic. 39, 40)
Reference

Cow-Catch®

Abb. 31
28 years female patient had crowding and local open-bite at the beginning.

Abb. 32
Crowding has been disappeared by eCligner®, and Cow-catch eCligner® was followed to treat open-bite as finishing purpose.

Abb. 33
After Cow-catch eCligner® for 1 month, ideal occlusion has been established in final stage.

Abb. 34
14 years female showed big open-bite due to maxillary expansion

Abb. 35
Cow-catch eCligner® was applied to improve open-bite as well finishing detailing to achieve ideal occlusion.

Abb. 36
Open-bite has been eliminated in 3 months later, and initial gap between aligner and teeth has been diminished through extrusion movement.
As long as alveolar bone is active and enough volume to outer stimulation, open-bite cases is treatment of choice with Cow-catch eCligner®.

Upon checking out the space in the both arches and intermaxillary interdigitation, buttons should be removed clearly after Cow-catch eCligner® use.

Anterior or posterior open-bite with ill torque occlusion case, Cow-catch eCligner® application leads to get both esthetic and functional result without showing metallic color nor patient inconvenience.
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Hinweis

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Seminarhinweis für 2014

Die Termine für die Zertifikat- und Anwenderkurse von eCligner in Deutschland stehen fest und sind wie folgt:

15. Februar 2014 im Intercity Hotel Stuttgart (HBF)
17. Mai 2014 in der Praxis Dr. J. Raiman, Hannover
23. November 2014 im Hotel Eden, Köln (im Anschluss an die DGAO-Jahrestagung in Köln)

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