Cow-Catch eCligner® for Extrusion movement

Prof. Dr. TaeWeon Kim, Seoul
Dr. Helmut Gaugel, Köln
Dr. Nils Stucki, Bern

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 set-up 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

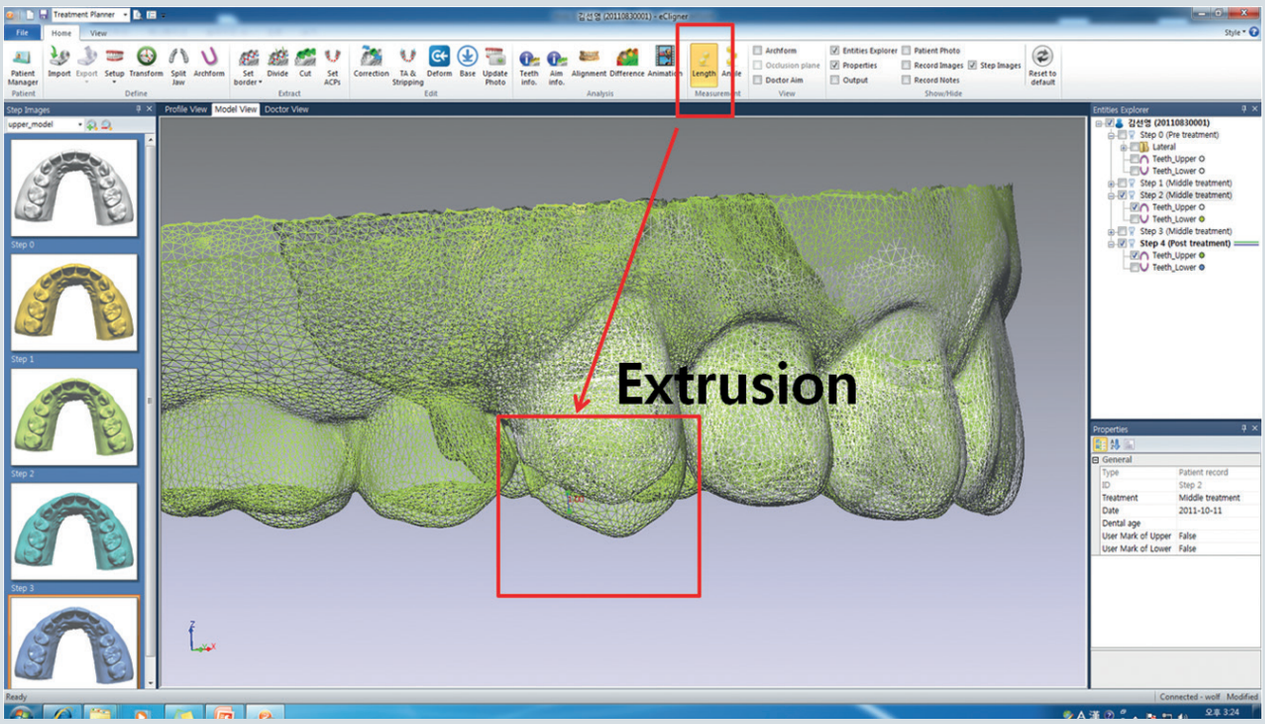
Abb. 1

Abb. 2

Abb. 3

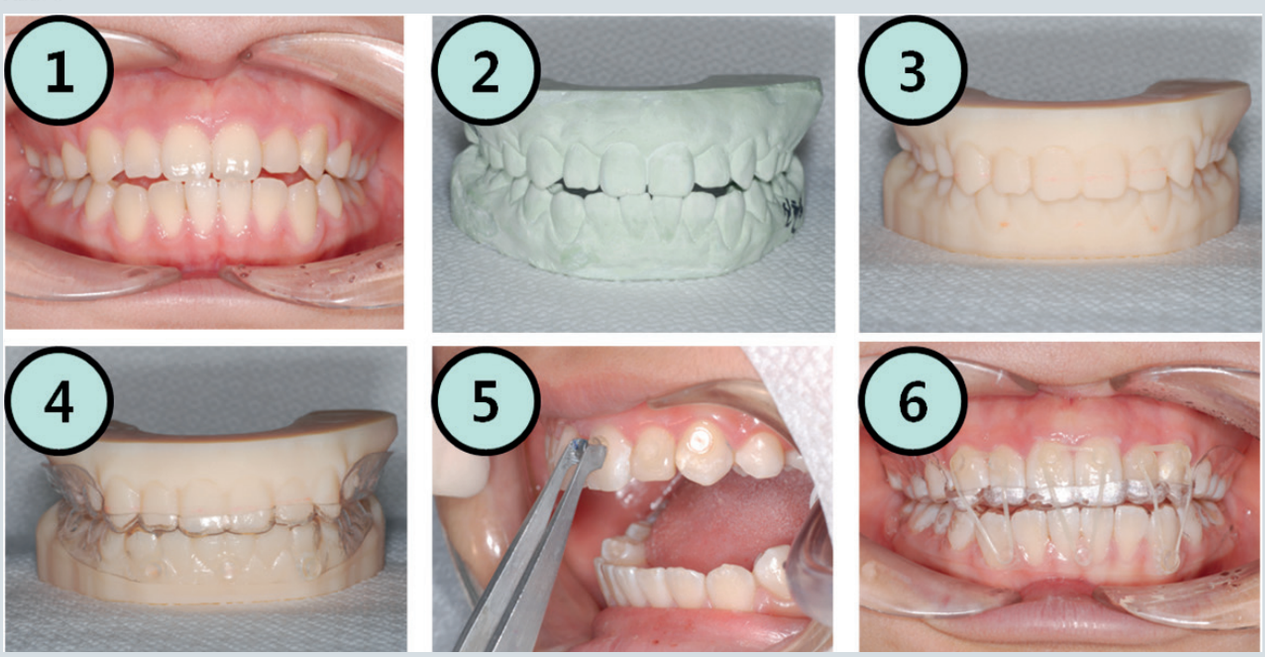
Abb. 1: Young female patient requires detailing in anterior region which shows mild open-bite
Abb. 2: Cow-catch eCligner® was applied with transparent bondable button on right upper lateral incisor and right lower reciprocal buttons made by thermoforming pliers(CA 1,2. piers)
Abb. 3: After 3 weeks use in sleep time (8~10 hours, 1/4 elastics), anterior occlusion has been improved with functional and esthetic result

Abb. 4



eCligner® software manipulation picture which data produces Cow-catch eCligner®.

Abb. 5



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.

Abb. 6

Finishing & detailing case by Cow-catch eCligner®. Right upper canine shows under-erupted situation.

Abb. 7

Cow-catch eCligner® is applied with elastic engagement to conduct interdigitation.

Abb. 8

After 1 month, functional & esthetic detailing has been completed 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. 9

Before Cow-catch eCligner® application

Abb. 10

After Cow-catch eCligner® application, shows improved occlusion is observed compare to before.

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.

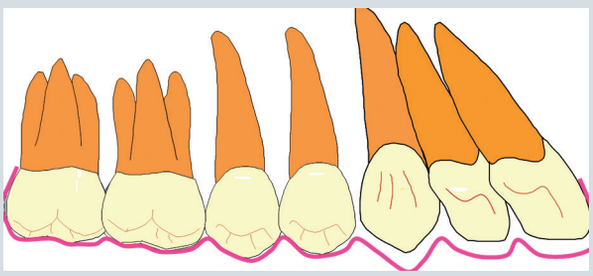
Abb. 16

Cow-catch eCligner® was applied to improve masticatory function and occlusion stability.

Abb. 17

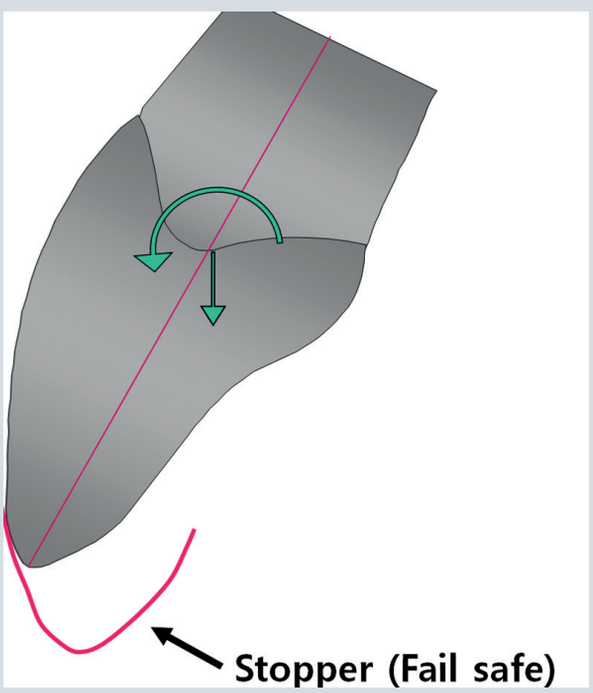
After Cow-catch eCligner® only in sleep time use for 3 months, buccal occlusion has been improved.

Abb. 18



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.

Abb. 19



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

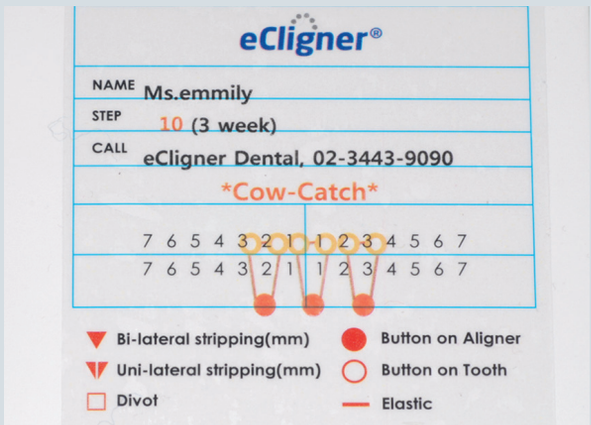
Abb. 20

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

Abb. 21

Anchorage buttons are made by thermoforming pliers (CA 1,2, Invisi-Tech, Korea).

Abb. 22



Cow-catch eCligner® instruction is stickered in the box.

Abb. 23

Clear buttons and elastics are included in the box.

Abb. 24

According to instruction, clinicians is able to apply Cow-catch eCligner® to the patient.

Abb. 25

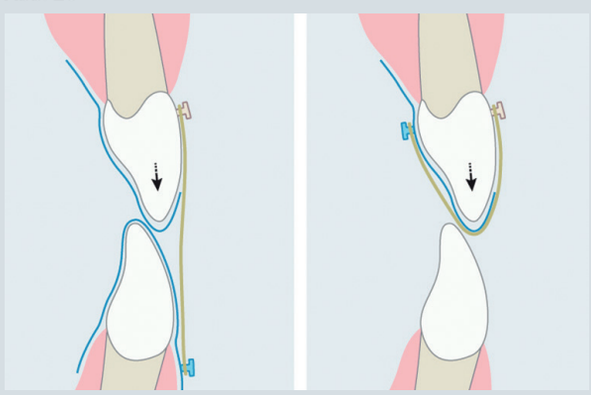
Included elastic holder(eCligner® remover) is helpful to apply the elastics by patient.

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.

Abb. 26



left; Cow-catch eCligner®,
right; modified Cow-catch eCligner® for day time use.

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)

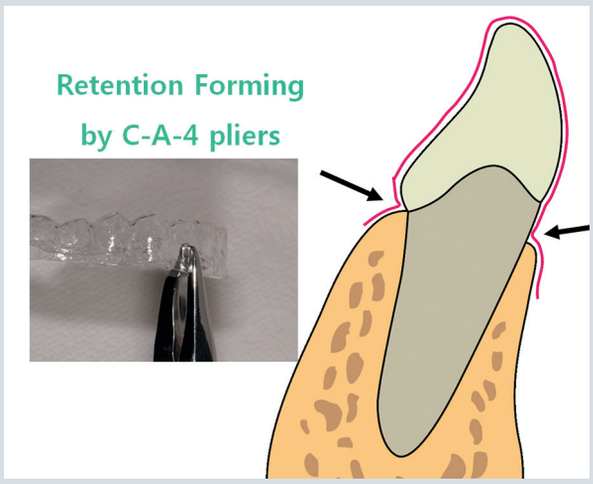
Conclusion

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 eatablished by close digitation that was driven in less side effect. (Pic. 39, 40)

Abb. 27

Modified Cow-catch eCligner® application. Patient can drink and speak meanwhile wear on. In case of big negative overbite, this aligner affords to increase application time for extrusion.

Abb. 28



After use of Cow-catch eCligner®, cervical clip forming(CA 3 piers, Invisi-Tech, Korea) enables to prevent relapse.

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Abb. 29

16 years old female student showed open-bite. Cow-catch eCligner® has been applied in sleep time everyday to improve anterior occlusion with esthetic fulfillment.

Abb. 30

17 years female patient had slight open-bite on left anterior region. Right upper canine was implant crown. Cow-catch eCligner® treated this case to make it functional occlusion in 1 months.

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.

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Abb. 37

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

Abb. 38

Showing final photo after eCligner® treatment.

Abb. 39

As long as alveolar bone is active and enough volume to outer stimulation, open-bite cases is treatment of choice with Cow-catch eCligner®.

Abb. 40

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 inconveniency.

Kontaktadressen

eCligner suisse AG
PO Box 310
CH-3000 Bern 7
Tel.: +41 31 326 06 66
info@eCligner.ch
www.eCligner.ch

eCligner Deutschland
Chemnitzer Straße 42
D-38226 Salzgitter
Tel.: +49 5341 841467
info@eCligner.de
www.eCligner.de

Hinweis

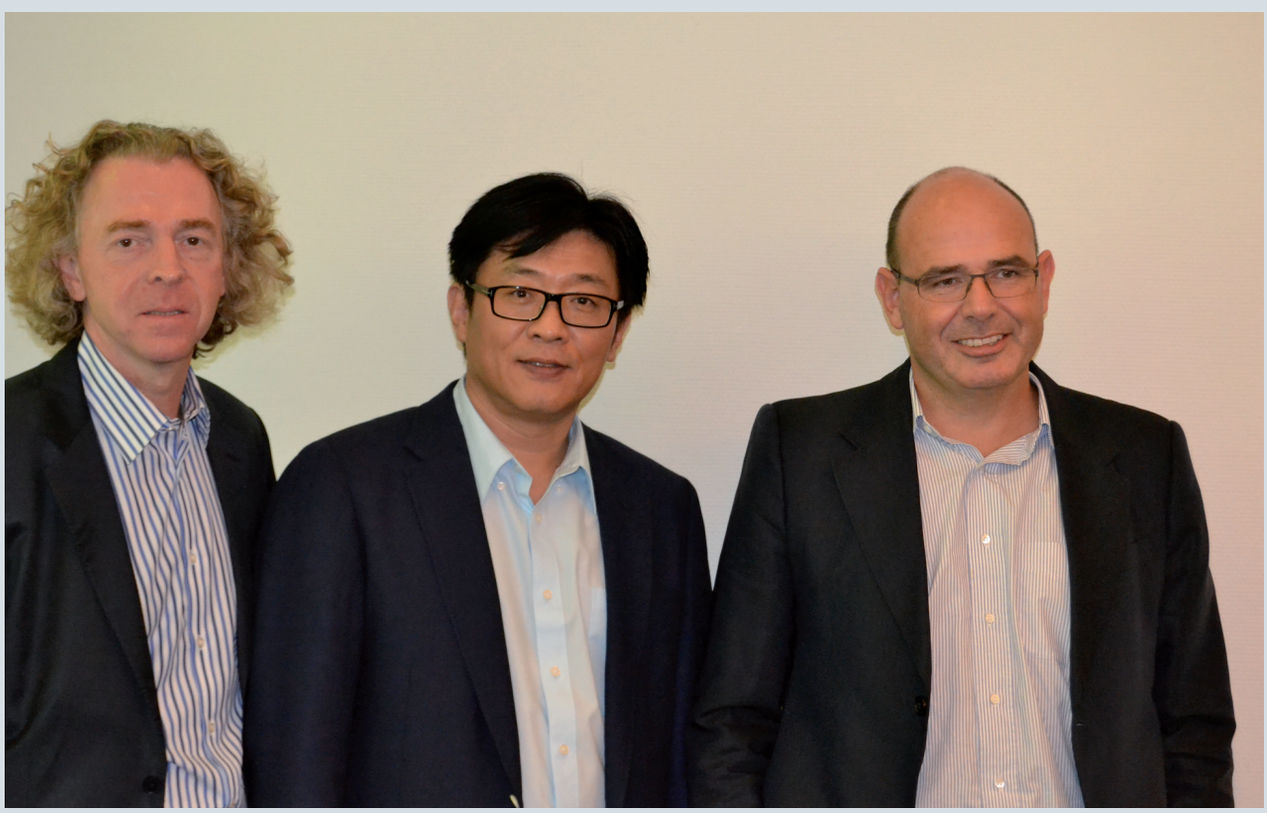
Dieser Artikel ist in partnerschaftlicher Kooperation mit der eCligner suisse AG entstanden und wird in der KFO-Intern und in den KN (Kieferorthopädie Nachrichten) der Oemus Media AG veröffentlicht.

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.

Autoren



Prof. Dr. TaeWeon Kim (Mitte), Seoul: Clinical Professor an der YonSei University Korea, Clinical Professor an der Korea University, Clinical Professor an der KyungHee University Korea, Clinical Professor am Binzou Med. College China, Privatpraxis in Seoul; Hauptarbeitsgebiete: ClearAligner, Microimplantate, eCligner-System, President eCligner International
Dr. Nils Stucki (rechts), Bern: Degree: Dr. med. dent., Department of Orthodontics an der Unversität Bern; 1991 Graduated: University of Bern, College of Dental Medicine; 1990 Postgraduate: Department of Orthodontics, University of Bern; 1996 Lecturing on: Clear-Aligner, eCligner, Invisalign, Microimplants, Lingual Orthodontics, CFO eCligner Europe.
Dr. Helmut Gaugel (links), Köln: niedergelassen in Gemeinschaftspraxis Andersson & Gaugel in Köln; seit 2007 Vorstandsmitglied der KFO-IG; Schwerpunkte: Ästhetische und unsichtbare Behandlungen mit Alignern, eCligner-System, von Beginn an Weggefährte von Prof. Kim, gibt weltweit mit ihm Seminare zu Alignerbehandlungen.