A lingual orthodontic case with 3M™ Incognito™ Appliance System combined with orthognathic surgery.

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Introduction
At present, there is an increasing demand for aesthetic orthodontic treatment on the part of patients. That makes lingual orthodontics with 3M™ Incognito™ Appliance System an alternative that has more weight in our dental practice every day, and especially when the patient knows that it will be lengthened in time. For this reason, many of our surgical patients require lingual brackets.

Presentation of the clinical case
The patient came to our office for joint pathology with discomfort in the right TMJ. In the intraoral exploration, there is Class II on the right side, which increases in centric relation, mild mandibular asymmetry, lower midline to the right, upper midline centered with Filtrum, absence of 36, upper and lower gingival recessions, crowding and articular clicking (Figure 1A-C).

Figure 1A-C

Click here to visit the 3M website.
In the extraoral examination, she presented malar hypoplasia, open nasolabial angle, 1 mm gingival smile and mandibular retrusion (Figure 2A-F).

In the teleradiography, the patient presents a Class II, with a birretrusion, the upper incisor was proclined and the lower incisor was retroclined. In the orthopantomography, the patient had no 36, the level of the bone was good and she didn’t have any dental problems (Figure 3A-B).

**Diagnosis and treatment plan**

After analyzing the patient and seeing that she presents a Class II that increases in centric relation, we proposed that for best results, we should perform Bimaxillary Orthognathic Surgery combined with lingual braces. We will close the lower space, leaving the 37 in the place of 36 and 38 in the place of 37.

We did the case analysis with the 3M™ Unitek™ Treatment Management Portal | TMP program, and the final result obtained was a good occlusion, with a canine and molar in Class I, and midlines centered (Figure 4A-C).

**Evolution of the case**

Once we decided that we were going to perform the case with Incognito Lingual Appliances, we took impressions of the patient and while we waited for the brackets to be finished, we put a splint for muscle relaxation on the patient to deprogram the mandible.

**The sequence of archwires used was:**

- Upper: 0.016 NiTi, 0.016x0.022 NiTi, 0.018x0.025 NiTi, 0.016x0.024 Steel, 0.0182x0.0182 TMA (all with bends).
- Lower: 0.016 NiTi, 0.016x0.022 NiTi, 0.018x0.025 NiTi, 0.016x0.024 Steel, 0.0182x0.0182 TMA (all without bends, except TMA).

Once the brackets arrived, we placed the upper and lower arches with 0.014 NiTi archwires in both arches. We kept both for two months and they reached arcs of 0.016 NiTi that we maintained for another two months (Figure 5A-C).
Since we were going to perform the closing of spaces in the lower arch, we did not begin to place the lower chain until we placed the steel arch. During this process, due to the mandible being in a centric relation, the lower dental midline was more deviated and the Class II was increased (Figure 6A-C, Figure 7A-D, and Figure 8A-B).

The patient wanted to be operated on as soon as possible for cosmetic reasons, due to the mandibular retrusion that occurs after the mandible stays in a centric relation, and early surgery was planned. We did photos before surgery to the planification (Figure 9A-J and Figure 10A-G).
After orthodontic preparation/decompensation, 3-D planning of the procedure is simulated by the surgeons, and CAD/CAM splints printed (Figure 11A-D):

Under general anesthesia and nasotracheal intubation, four miniscrews were placed for intraoperative maxillomandibular fixation and postoperative elastic management. After that, a posterior approach in the mandible allowed for bilateral sagittal osteotomy with advancement and centering according to the CAD/CAM intermediate splint. On each side bone fixation was achieved with a miniplate, four mono-cortical screws and one bicortical screw.

Then, a minimally invasive 2 cm approach to the maxilla allowed for a LeFort I osteotomy, with the twist technique published by the surgeon. Two preformed plates were used for maxillary fixation according to the final splint. Incisions were closed in planes. Surgical time was 80 minutes (Figure 12A-D, Figure 13A-D, and Figure 14A-D).

Immediate postoperative recovery was uneventful, and the patient was discharged from the hospital the day after the procedure.
We continued to close the space after the surgery in the lower arch with the help of intermaxillary elastics on the vestibular area just after the surgery, since the patient did not present much oral opening (Figure 15A-E and Figure 16A-J).
We worked with steel arches for eight months, closing the occlusion.

The last three months, we used TMA archwires of 0.0182×0.0182 in both arches to carry out the finalization of the case (Figure 17A-D and Figure 18A-D).

We performed the placement of fixed retainers in both arches at the end of treatment. The incisal edges of the upper incisors that were abraded have been reconstructed with composite.
Treatment results
The patient achieved a canine and molar bilateral Class I. The spaces were closed and the occlusion is acceptable. The facial and smile aesthetics improved greatly and the joint discomfort improved. In the teleradiography, the inclination of the incisors is correct, and the patient has a Class I. In the orthopantomography, the patient has good parallelism of the roots, she doesn’t have resorption and the level of the bone is good. (Figure 19A-C, Figure 20A-H, and Figure 21A-B).

Conclusions
In cases where there is a severe skeletal discrepancy, it is necessary to perform a combined orthodontic treatment and orthognathic surgery in order to obtain all goals.

Case photos provided by the authors.