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Ac.C.O Modified appliance

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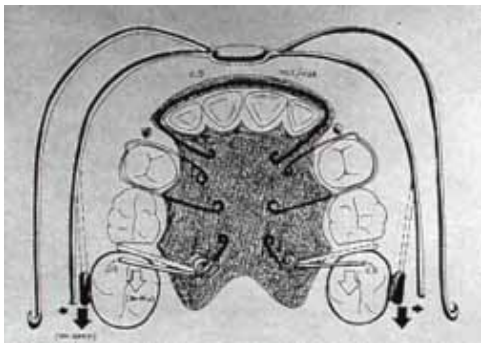
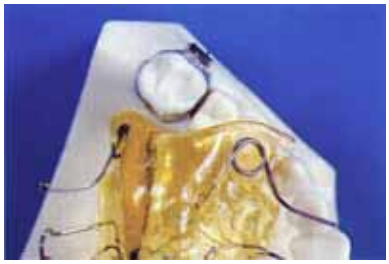


Of the many distalizing appliances, the ACCO (*ACrylic Cervical Occipital*) has been shown to be successful among orthodontists. This is partly due to its effectiveness when used in conjunction with extra-oral traction. (Fig. 1)

Fig. 1- The Original Ac.C.O



This removable appliance, introduced in Italy by Dr. Cetlin, is equipped with two finger springs located mesial to the first molars. These springs deliver a very small distal force (30-40 gr. according to Cetlin).(Fig. 2)

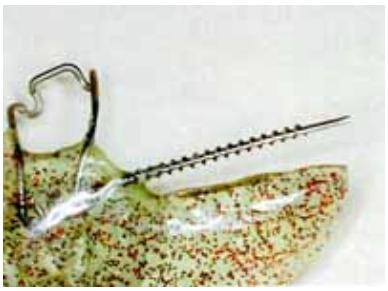
Extra-oral traction (150-200 gr.) should be worn for 10-12 hours per day.
The purpose of extra-oral traction is to control tipping of the molars.

The most appreciable advantage of this appliance is that using low forces, it allows for bodily movement of molars (single force+ couple force) with complete occlusal clearance (due to the anterior bite plane). The distalization achieved is therefore more stable and less prone to relapse.

However, in clinical use, some drawbacks may occur causing treatment delay. The most common difficulty is related to the insertion of the finger spring into the space between the molar and the tooth mesial to it, since this contact is often tight, preventing full seating of the appliance (Fig. 3). To solve this problem, it is usually necessary to separate the teeth prior to insertion.

Another difficulty concerns the necessity for periodic activation of the springs so that the force levels are continuous. The continuous force delivered is one of the advantages of this appliance.

The modified Ac.C.O.

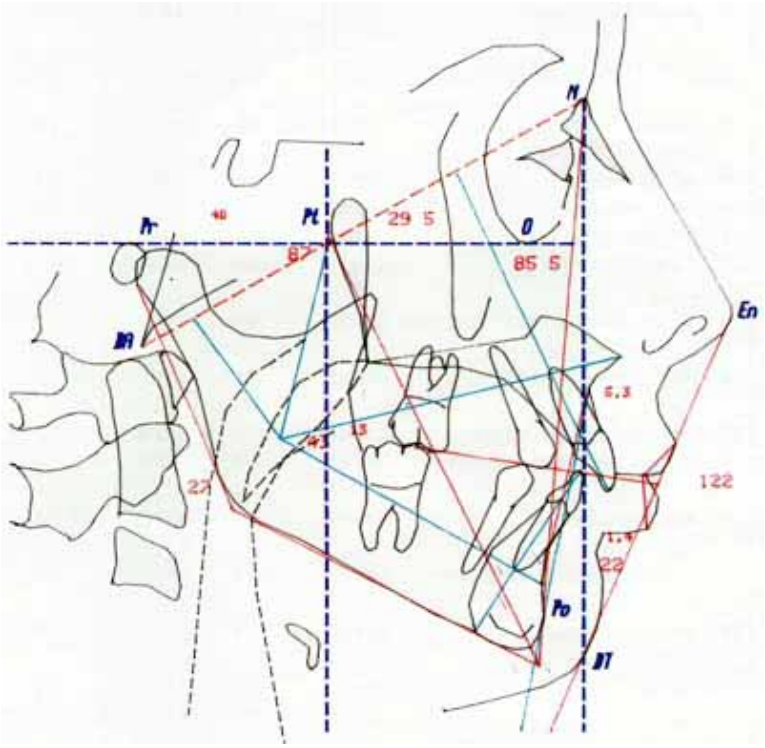


In order to eliminate the separation appointment, we have developed a modified plate exploiting the characteristics of the elasticity of the nickel-titanium alloys. Leaving the acrylic part of the plate unchanged, the distalizing components have been altered (Fig. 4). At the distal of the plate close to the molars, we incorporated two sections of .019 x .025 "Thermal-memory" rectangular wire (Leone). As for the distalizing force, we applied an open "Memory" coil spring (Leone heavy type .014) inserted into the acrylic from the side to prevent it from escaping.

These nickel-titanium springs can deliver a constant force of 50 gr. in a progressive manner and are therefore very elastic. (Fig. 5) A .022" x 0.028" sheath is soldered on the lingual of each molar band. The sheaths can then accept the coil spring assembly. Tipping control is achieved using the wire guides inserted in the sheath and from their natural reactivation when distorted, from the temperature of the oral cavity. (Fig. 6)

As with the original Ac.C.O., this appliance is stabilized by two Adams clasps on the first bicuspids and also undercuts at the upper central and lateral incisors. For this reason Dr. Cetlin recommends re-adapting the acrylic periodically (Fig.7)

Clinical cases:
To evaluate the clinical effectiveness of this appliance we will demonstrate a case. An 11 year old female patient presented with dental and skeletal Class II division I malocclusion and skeletal dolico-facial characteristics. (Fig. 8) To evaluate whether the distalization achieved was bodily or not, we used only the Ac.C.O. plate without the use of extra-oral traction.



Cefalometric Analysis

method Ricketts
age:11 years

	Normal Value		Clinical Value	Description
1 - Basion-Nasion and CC-Gnathion (degree)	90	+3/-3	87	Facial angle
2 - Fh plane and CF-XI (degree)	76	+3/-3	76	mandibular position
3 - Fh plane and facial plane (degree)	87,7	+3/-3	85.5	facial depth
4 - Ans-XI and XI-Pm (degree)	47	+4/-4	43	anterior facial height
5 - Fh plane and Nasion-A (degree)	90	+3/-3	91	maxillary depht
6 - inter-incisor angle (degree)	130	+8/-8	122	
7 - piano Fh e Nasion-Basion (degree)	27	+2/-2	29.5	cranic deflection
8 - DC-XI e XI-Pm (degree)	27	+4/-4	25	mandibular arch
9 - A-Pogonionfrom 11 - (mm.)	1	+2/-2	1.4	protrusion of inf. incisor
10 - A-Pogonionand 11- (degree)	22	+4/-4	22	inclination of inf. incisor
11 - A-Pogonionfrom 11 + (mm.)	3.5	+2/-2	7.8	protrusion of sup. incisor
12 - A-Pogonionand 11+ (degree)	26	+4/-4	36.5	inclination of sup. incisor
13 - Gonion-Gnathion and facial plane (degree)	68	+3.5/-3.5	67.5	.
14 - PTV from +6+ (age 11) (mm.)	14	+2/-2	13	molar position
15- inferior lip protrusion (mm.)	-2.4	+2/-2	1.4	
16- superior lip protrusion (mm.)	-2.9	+2/-2	-0.3	
17 - A from flacial plane (mm.)	1.3	+2/-2	5.3	convexity
18 - Fh plane and Gonion-Gnathion (degree)	25.3	+4/-4	27	F.M.A.
19 - Fh plane and Pns-Ans (degree)	1	+1/-1	-1.5	inclination of palatal plane
20- Overjet (mm.)	2.5	+1.5/-1.5	6.3	
21- Overbite (mm.)	2.5	+1.5/-1.5	3.1	
22 - +1 + respect to CC-Gn (degree)			-1	

23 - goniac angle (degree)	120.5	+3/-3	140	

SKELETAL DEFINITION

	Dolico	Meso	Brachi
1. Facial axis angle	***.***.***	87	
3. Facial depht	***.***.	85.5	
4. Facial inferior heigth		43	**.**.**.**.
8. Mandibular arch	**.**.	25	
18. F.M.A.	**.**.	27	
Goniac angle	***.***.***.***.***.	140	

This diagnosis is incomplete: it only considers the antero-posterior and vertical problems through the ceph, but not transverse problems (e.g. cross-bite, overcrowding, diastema, rotations, etc.). Also, supernumerary or missing teeth are not considered. The clinical examination and the model analysis are therefore also taken into account. The facial type is severely DOLICO. Since the masticatory musculature is very weak, the anterior lower face height is increased. The antero-posterior relationship between the maxilla and mandible indicates a moderate skeletal Class II. The mandible is retrognathic. The upper incisors are very protrusive and proclined. The overjet is significantly larger than average and her profile indicates protrusion of the lips.

DATA INTERPRETATION

The upper incisors are very protrusive and very proclined.

The lower incisors are positioned within normal limits.

The interincisal angle is normal.

The overjet is much greater than average. The profile shows protrusion of the lips.

The hard palate is oriented such that its posterior is tipped inferiorly.

Point A is 1 mm ahead of the line of McNamara.
The Po point is 8 mm behind the line of McNamara.
After a few weeks of treatment with the appliance, there is space developing mesial to the molars (Fig. 9)

Shows excellent distalization of the molars without any tipping. With 24 hour wear, Class I molar relationship has been achieved.

After 4 months, enough distalization has been achieved to overcorrect the molar relationship. The next phase of treatment involves fixed appliances according to the method adopted from Boston University. (Fig. 10A-10B-10C)

After this first experience, we concluded that in cases which require distalization of upper molars, it is possible to achieve bodily movement of these teeth using this appliance. This is possible without extra-oral traction and therefore with better patient comfort which translates into better compliance.

HOME VJO 2.1

HOME VJO

References:

1. **Cetlin N. M.**
   "La filosofia della terapia ortodontica senza estrazioni"
   Quad. SIDO N. 17 Corso agg. 1984.
2. **Cetlin N. M. Ten Hoewe A.**
   "Non extraction treatment" J. Clinic. Orth. 10:37-53, 1983
3. **A. Antony Gianelly**
   "Schemi sintetici d'ortodonzia" Ed. Cides Odonto, 1979
4. **A. Antony Gianelly**
   "Considerazioni sulla tecnica ed il trattamento delle I, II, III classi" - Ed. Cides Odonto, 1978
5. **Federico V. Tenti**
   "Guida alla scelta ragionata degli apparecchi ortodontici fissi e rimovibili"- Ed. Microlito Editrice 1983, Recco (GE)
6. **Robert E. Moyers**
   "Manuale di ortodonzia" Ed. Internazionali, 1991 Milano.
7. **Maurice J. Combes**
   "Les forces extra orales in ortodontie" -Ed. Julien Prelat, Paris.