

New therapeutic management of the TMD, through the immediate Re-educational bite: “Lingual Ring Ri.P.A.Ra.”

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New therapeutic management of the TMD, through the immediate Re-educational bite: "Lingual Ring Ri.P.A.Ra."

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Abstract Objective

The aim is to present the authors' experience on a protocol based on an alternative therapeutic use of the bite in patients with Temporomandibular disorders (TMDs), which also included the active repositioning of the tongue. The protocol requires a more active cooperation of the patient and the use of the bite as a re-educational tool. To achieve this, the Ri.P.A.Ra. Lingual Ring was used;

Background

The diagnostic and therapeutic setting of Temporomandibular Disorders (TMB) and the etiologic framing have been changed in recent years. Therefore, the therapy with bite should also be adapted to international literature that provides for new therapeutic approaches: "Cognitive Awareness, Counseling, Self-Care, Patient Education, Lifestyle Modification, Behavioral Therapy". Therefore, the traditional concepts of bite therapy should be revisited.

1 **Materials and methods**
2

3 A consecutive series of 600 patients were observed, from February 2014 to February 2016.
4
5 From the initial 600 patients, 160 subjects were selected, all with disc displacement with
6
7 reduction that was treated according to the new protocol using the Ri.P.A.Ra. Lingual Ring.
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10
11
12 **Results**
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14 99 patients out of 160 (62%) experienced remission of all symptoms within 3 months. This
15
16 result was also confirmed by the instrumental tests performed: magnetic resonance imaging
17
18 (MRI of TMD) with and without the Lingual Ring in the mouth, and electromyography.
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22
23 **Conclusions**
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25 The bite Lingual Ring combined with self-cure and exercises - counseling, behavioral
26
27 therapy and home-based and clinical exercises -, myo-behavioral gnathology, has proved to
28
29 be an effective device for immediate treatment of TMDs.
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33 **Key words:** Bite; Lingual Ring Ri.P.A.Ra.; TMD Rehabilitation.
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37 **TEXT**
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41 **Introduction**
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43 The diagnostic and therapeutic setting of Temporomandibular Disorders (TMB) with
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45 RDC/1992¹ and DC/2014² by Axis 1 and Axis 2 and the etiologic framing have been
46
47 changed in recent years. Above all, the causal role of occlusion^{3,4} was modified, to which a
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49 significant etiological action⁵⁻⁸ was first attributed. Nowadays, instead, neuromuscular
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51 factors linked to psychosocial problems⁹ and stress¹⁰ already mentioned in the past¹¹⁻¹³,
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53 coupled with certain facial morphologies¹⁴, have come to great lengths. Therefore, the
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1 therapy with bite should also be adapted to international literature which provides for new
2
3 therapeutic approaches: "Cognitive Awareness, Counseling, Self-Care, Patient Education,
4
5 Lifestyle Modification, Behavioral Therapy"¹⁵⁻²⁴, and must be adapted to the "Bio-Psycho-
6
7 Social" model through "conservative therapies based on evidence and low invasiveness"^{2, 24,}
8
9 ²⁵. Therefore, the traditional concepts of bite therapy should be revisited.

10
11
12 The bite must no longer be worn only during the night and a few hours during the day in a
13
14 passive manner, with clinical controls limited to occlusal contact evaluation. The bite, being
15
16 an important therapeutic device recognized and validated by the scientific community^{24,26-28},
17
18 has to become a reeducative device, considering the role of neuromuscular and psychosocial
19
20 factors, concomitant to the occlusal ones.

21
22 This is achieved through an active collaborative involvement of the patient with behavioral
23
24 strategies and physical exercises performed by the patient through the bite. The review of
25
26 international literature, in fact, is now agreed to recognize as valid, and at times equal,
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28 therapeutic measures:

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30
31 -A.) Bite therapy; -B.) therapy by counseling and self-care; -C.) therapy with physiotherapy
32
33 exercises performed by the patient at home and performed with the therapist ¹⁵⁻²³ (Fig.1).

34
35
36 In this paper, we present a new therapeutic protocol with a different bite management that
37
38 involves a greater collaboration by the patient. The bite becomes a real reeducative device by
39
40 which the patient also performs the previously mentioned -B) and -C) therapeutic approaches
41
42 and the clinician is not limited to controlling the occlusal contacts but manages the bite as a
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44 means of neuromuscular deprogramming and functional cognitive behavioral re-education
45
46 (Fig.1). This protocol, to be applied, required the use of a new immediate device: the lingual
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48 ring bite Ri.P.A.Ra. (Figs 2-5), which has been in use by some years at various private and
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50 public Italian facilities. These include the Clinical Gnathology Service of the Umberto I
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52 Clinic of La Sapienza University in Rome^{26,27,29}, the Unit of Orthodontics at the Department
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1 of Surgical, Oncological and Dental Disciplines of the "Paolo Giaccone" Polyclinic in
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3
4 Palermo, and various local health units (ASL).
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7

8 **Materials and methods**

9 *Patient selection*

10 From February 2014 to February 2016, at the various structures indicated, a consecutive
11 series of over 600 patients arrived. All subjects were evaluated with basic clinical and
12 instrumental protocols to evaluate dysfunction and/or the presence of osteoarticular
13 structural abnormalities in accordance with DC/TMD Criteria for Temporomandibular
14 Disorders. The observed pathologies were multiple, so patients were selected according to
15 the inclusion and exclusion criteria below.
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27 *Inclusion criteria*

28 Reducible disk dislocation; articular pain \geq 20 Verbal Rating Scale (VRS); muscular pain
29 \geq 20 VRS; tensile and/or migraine headache \geq 20 VRS; cervical disorders and/or spinal
30 pains of tensile origin \geq 20 VRS; parafunctions associated with muscular and/or joint pains;
31 consent to be part of the study.
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40 *Exclusion criteria*

41 Non-reducible dislocations of the articular disk; outcomes or post-traumas, malformations or
42 TMB or maxillofacial interventions; patients already in therapy for the current pathology;
43 systemic joint disorders (rheumatoid arthritis, osteoarthritis, psoriatic arthritis, Ehlers-Danlos
44 syndrome); neurological and/or psychological pathologies and/or headache; partially
45 edentulous patients with lack of more than 8 dental elements; positivity to axis 2.
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1 Out of the 600 visited patients, 440 were not considered because they did not match the
2 inclusion criteria. Of these, 64 had articular locks; 26 reported trauma and fracture outcomes;
3
4 120 had a pain threshold below 20 VRS; 26 missing more than 8 dental elements without
5
6 proper dentures; 24 denied the consent to be part of the study.
7

8
9 The remaining 160 have been included in the new protocol. The sample was then
10 represented by a consecutive series of 160 subjects, of which 128 were female and 32 male,
11
12 aged 21 to 63, with an average of 42 years. All patients (100%) were affected by reducible
13
14 dislocation of the articular disk; 109 subjects (68%) reported TMB pain; 115 patients (72%)
15
16 had muscular pain; 123 patients (77%) reported headache; 82 (51%) accused cervical pain;
17
18 130 (81%) had parafunctions with evident signs of abrasion and history of teeth clenching or
19
20 bruxism noise.
21
22

23
24 All patients were adequately informed about the use of the bite Lingual Ring Ri.P.A.Ra. and
25
26 on the new protocol to be followed (Figure 1): -A.) Bite therapy Lingual Ring Ri.P.A.Ra. to
27
28 bring all nights; -B.) therapy by counseling and self-care; -C). therapy with exercises of
29
30 physiotherapy performed with the bite Lingual Ring Ri.P.A.Ra. by the patient at home and at
31
32 the various structures with the help of the therapist (15-23) (Figure 1).
33
34

35 36 37 38 *Detailed Description of Form and Function of the Lingual Ring Ri.P.A.Ra.*

39
40 Before presenting the clinical protocol in detail, we describe the peculiar characteristics of
41
42 the Ri.P.A.Ra Lingual Ring (Ri.P.A.Ra: Ri=Reeducative, P=Positional, A=Active,
43
44 Ra=Rampello) (Industrial Patent No. RM2014A000673 extended to Europe and USA.
45
46 Registered at the Ministry of Health in the list of medical devices with identification number
47
48 1175800, repertory "N", class code attributed "A1", with trade name "Lingual Ring
49
50 Ri.P.A.Ra.", CND Q010499, in regular trade with " CE "since 2014) (Fig. 2).
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Form

The Ri.P.A.Ra Lingual Ring is made up of different parts which for convenience we divided into center "C" and periphery "P" (Fig. 2).

The central part "C" is formed by the Lingual Ring and the two horizontal planes and is the most "active" part; the peripheral "P" part is formed by balancing, anchoring, connecting and stabilizing systems and is the "passive" part. In part "C", the Lingual Ring is made up of two arcs: the lower arc "1" and the upper arc "2", which extend laterally on the two horizontal planes that lie between the teeth: the "3R" plan to the Right side, and the "3L" plan to the Left side. This two arcs formed together the Lingual Ring, that's the most important functional "active" unit. (Figs 2 and 3).

In the "P" part, that is, the peripheral part of the reinforcement, anchoring, balancing, joining and stabilizing systems, we find: two small symmetrical vertical ("4R" and "4L") palatal reinforcement edges, two genial symmetrical vertical balancing lateral shields ("5R" and "5L"), a frontal vestibular bandage "6" connecting the two lateral genial shields. To assemble everything, after several technical tests of compression, twisting, traction, cutting and analysis of similar devices already on the market, a platinum, non-toxic, non-allergenic, biocompatible medical silicone was selected, complying with the regulations (UNI EN ISO 10993 1: 2010) and EU Directives 93-42 CE, Hardness 55-60 Shore (Class 1 Medical Device).

Function

The Lingual Ring Ri.P.A.Ra. has very particular characteristics that stem from many years of clinical research and validation^{26, 27, 29}. As described, in the central part "C" there is a ring formed by two arches and two horizontal planes. The ring with lower arc "1" performs two important functions: it guides the jaw and the condyles to the advanced position and drives

1 the tongue up and forward to the "Spot". The upper arc "2", on the other hand, functions to
2
3 keep the device up from the tongue. The two horizontal planes perform other important
4
5 functions: they change the vertical dimension; release the occlusal gear and change the joint
6
7 occluded ratios.
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10 The "P" part, constituted by the genial lateral shields and the frontal bandage, equals the
11
12 forces of the buccinic muscles and contributes to the stabilization and retention of the entire
13
14 device. The new posture of the jaw and tongue, besides modifying the vertical dimension,
15
16 stimulates the elongation of all the muscles of the stomatognathic apparatus, both vertical
17
18 (masseter, internal and temporal pterygoids) and horizontal (external pterygoids and
19
20 buccinic) and the tongue. Consequently, it induces a change in lever and force arms and, at
21
22 the same time, drives the tongue to stay higher and forward with the tip to the spot for
23
24 further neurological stimulation³⁰⁻³³. The new posture of the jaw and tongue therefore
25
26 promotes the change in the position of the hyoid bone as well as the paravertebral muscles of
27
28 the spine.
29

30
31 The lingual ring Ri.P.A.Ra. therefore influences and affects all these components more fully
32
33 and aims at positional re-education of the tongue, jaw and all components of the
34
35 stomatognathic apparatus (Fig. 3). This differentiates it from other universal devices, which
36
37 instead tend to distance only the dental arches without any repositioning and re-educative
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39 function, being designed to be "bearings" of contrast to the load of the muscles of the
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41 vertical muscles (masseters, internal and temporal pterygoids). Joint occluded
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43 reprogramming, with the re-education of the tongue induced by the new position and
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45 exercises, has beneficial effects on all stomatognathic components and on mandibular
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47 cervical cranial (or TMD) pathologies.
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53 *Therapeutic protocol*
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1 The therapeutic protocol we adopted has foreseen an association program of three major
2 therapeutic concepts that are now recognized by international literature ¹⁵⁻²³. These have not
3
4 been split or cadenced in a separate way but integrated together (Fig. 1):
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6

- 7 • Therapy with the Bite Lingual Ring Ri.P.A.Ra.;
- 8 • Therapy by counseling and self-care, concurrently to the use of the Bite Ring-Lingual
9 Ri.P.A.Ra.;
- 10 • Therapy with physiotherapy exercises with the bite Lingual Ring Ri.P.A.Ra. in the
11 mouth, carried out by the patient at home and under the supervision of the clinician.
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18 Thus, the new protocol, performed with the bite Ri.P.A.Ra. in the mouth, was composed by
19 the set of (-A.), + (-B.), + (-C.) (Fig. 1).
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22 All patients were therefore adequately informed on the type of protocol, the characteristics
23 and the use of the Bite Lingual Ring Ri.P.A.Ra., the exercises to be performed with the Bite
24 Lingual Ring and behavioral cognitive therapy with the complete path to follow.
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30 The following scheme has been adopted:
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- 33 • Detailed information, explanation and instruction on the ongoing pathology, to obtain
34 the conscious perception of the problem and the best possible compliance;
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36
- 37 • Detailed information, explanation and instruction on self-cure and behavioral tips;
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39
- 40 • Detailed information, explanation and instruction on the device Lingual Ring
41 Ri.P.A.Ra. with the directions on use: wear all nights (6-8 hours) and at least 2 hours
42 during the day to perform exercises with the indication of placing the tongue above
43 the "Spot"; cognitive information not to tighten the teeth on horizontal planes (3R
44 and 3L);
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- 48 • Detailed information and explanation on exercises to be performed with the device
49 Lingual Ring Ri.P.A.Ra. in the mouth at home: at least three times a day in the first
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1 21 days of therapy: the morning at waking; coming home after work; the night before
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4 going to bed. Then, at least once a day in the next 10 days, always with indication to
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6 place the tongue above the "spot" and cognitive information not to tighten on the
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8 horizontal planes (3R e 3L);
9

- 10 • All patients were asked during control visits: a description of the evolution of the
11 symptoms, the presence or absence of discomfort or disturbance, and the timing of
12 the use. At each check, patients were invited to perform the assigned physiotherapy
13 exercises with the Lingual Ring Ri.P.A.Ra. inserted into the mouth and the clinician
14 observed and eventually corrected the execution with motor coordination,
15 emphasizing the importance of language posture to the "Spot" and especially of
16 cognitive perception not to tighten on horizontal planes;
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18 • For all patients the only occlusive therapeutic device was the Ri.P.A.Ra Lingual
19 Ring;
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21 • The maximum duration established for an entire treatment cycle was 3 months.
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34 Patients were duly informed and prior written consent was obtained from each of them for
35 the use of the bite Ri.P.A.Ra.. A periodic check timing was planned that provided visits
36 every 15-20 days. All patients were evaluated by comparison of the measured parameters at
37 the beginning (T0): pain, analysis of mandibular movements with qualitative and qualitative
38 comparison of fluidity, symmetry and asymptomaticity.
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44 At the end of therapy, a segmentation analysis was performed that provided the following
45 evaluations: **Worsened**: at least a symptom or a sign got worse and no one improved;
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47 **Stable**: no symptoms improved and sign worse; **Improved**: at least one symptom improved
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49 and no one got worse; **Much Improved**: complete absence of signs and symptoms.
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1 The synthesis of the analysis of the considered symptoms, expressed both in absolute values
2
3 (number of patients) and in percentages, to make conclusive assessments of the effectiveness
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5 of the new integrated protocol, using the RiP.A.Ra Lingual Ring are summarized in Tables 1
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7 and 2.
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9

10 11 12 *Symptomatic and functional response expected*

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14 The symptomatic and functional responses expected of the application of the new protocol
15
16 via the bite Lingual Ring Ri.P.A.Ra. were: reduction of muscular and articular pain
17
18 symptoms; reduction of headache; reduction or disappearance of TMD noises with the
19
20 improvement of qualitative and quantitative subjective and objective movements; absence of
21
22 dental gear changes appreciable to both the patient and the clinician.
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30 **Results**

31 The analysis of results has allowed the following considerations.
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33 The time of application of the new protocol with the simultaneous use of the bite Ring
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35 Lingual Ri.P.A.Ra. was about 3 months for all subjects. The minimum time to have a
36
37 significant improvement in symptoms was about 1 month in 52 patients. The maximum time
38
39 was 3 months in 20 patients. The mean time was 2 months in 88 patients.
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41

42 The minimum time in which the bite Lingual Ring Ri.P.A.Ra. was worn was 4 hours in 16
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44 patients. The maximum hours of application including time for home physiotherapy
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46 exercises were 13 hours in 95 patients, between night and day. The average daily application
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48 time was 8.5 hours.
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50 Joint pains, initially present in 109 patients, equal to 68% of the sample, disappeared in 73
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52 patients (67% of 109 and 46% of the total 160) and improved in 36 patients (33% of 109
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1 with TMD pain and 22.5% of 160 totals). Therefore, the TMD pain was resolved in 2/3 and
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3
4 reduced in intensity in about 1/3, while no one reported a worsening.

5 Myalgia, initially present in 115 patients, equal to 72% of the sample, disappeared in 83
6
7 patients (72% of the initial 115 and 52% of the total sample) and improved in intensity in 32
8
9 patients (28% of patients with myalgia and 20% of the total 160). These data confirmed, here
10
11 again, that more than 2/3 of the patients resolved muscle pain and less than 1/3 had
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13 attenuated pain, while no one worsened.

14
15
16 Headaches, present in 123 patients, equal to 77% of the sample, disappeared in 59 patients
17
18 (48% of the 123 and 37% of the total sample). Among the remaining 64 patients, in 29 of
19
20 them (24%) headaches were mild and improved compared to the beginning while remaining
21
22 stable in 27 with mean intensity and 8 with strong intensity (22% and 6% = 28%) confirming
23
24 that if the symptomatology is related to the dysfunction tends to improve.

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27 Cervical pain, present initially in 82 patients, equal to 51% of the sample, disappeared in the
28
29 post in 28 patients (34%). All these patients initially reported tensions or verticalizations. Of
30
31 the 54 stable patients, 26 (32% out of 82) reported a slight improvement. These patients had
32
33 predominantly typical regional pathologies, such as vertebral crushing, osteoarthritis or
34
35 whiplash after effects.

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37
38 The other 28 (34% of the 82) had an initial diagnosis of lordosis accentuation. This data
39
40 suggests that our protocol with the use of the Lingual Ring Ri.P.A.Ra. can give a greater
41
42 advantage to those who have problems with rectilinearization of the cervical tract, rather
43
44 than those with stressed lordosis. Therefore, we find it essential to undertake an in-depth
45
46 evaluation of this parameter with interdisciplinary instrumental and clinical investigations.

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48
49 Of the 130 patients with parafunctions, which accounted for 81% of the total, 101 (78% out
50
51 of 130) reported a different feeling of tightening their teeth and waking up in the morning
52
53 with less muscular tension, which remained stable and almost unchanged in 29 cases (22%).
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55

1 TMD noise, present in the whole sample (160 patients, 100%) disappeared in 103 patients
2
3 (64%), improved in 51 subjects (32%) and remained stable in the remaining 6 patients (4%).
4

5 No patient reported a symptom worsening.
6

7
8 These data induce us to believe that our protocol for some symptoms, such as TMD pain,
9
10 myalgia and muscular hyperactivity, in the short and medium term has a good response. For
11
12 more mechanical issues, regardless of whether they are related to muscular hyperactivity
13
14 and/or occlusal alterations, although we had a good response, we think it is necessary to have
15
16 a therapeutic timing longer than 3 months used in this first study, to further consolidate the
17
18 anatomic function rebalancing.
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21 To conclude the result evaluations, we report the final analysis, based on both the symptoms
22
23 and responses provided by the patients as compared to how they felt before initiating therapy
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25 (Tables 1 and 2).
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32 **Discussion**

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34 The classic bites used in gnathology today are predominantly passive, they are not used and
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36 matched by clinicians to the functional exercises and are not structured to do accomplish that
37
38 purpose. The patient just wears them and the clinician during the controls is limited to
39
40 controlling the presence of dental contact variations. The numerous immediate bites that
41
42 have been commercially marketed over the last years are largely devices to protect the teeth
43
44 from bruxism and/or clenching and are not reeducative or functional. The Lingual Ring
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46 Device Ri.P.A.Ra. is, however, very different from the first and the latter because it is born
47
48 just like reeducative bite.
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51 As illustrated in the description of the protocol, the Lingual Ring, in addition to being worn,
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53 involves a path of active involvement of the patient, especially with regard to the posture of
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1 the tongue, the physiotherapy exercises, to be performed with the Ri.P.A.Ra. in the mouth,
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3 and the behavioral attitude to not tighten on the horizontal planes of the bite itself. This is to
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5 jointly combine the three therapeutic lines of (-A.), + (-B.), + (-C.) (Fig. 1), which are now
6
7 reviewed by the literature ^{24,26-28}. In the recent years, our treatment strategies have followed
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9 this direction and the protocol described has enabled us to obtain the illustrated results and
10
11 thus draw the following considerations and conclusions.
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14 - None of the 160 patients in the sample worsened his situation. This data is very significant
15
16 given the low cost of clinical management, being a ready-to-use device, the low economical
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18 and biological costs, but especially the low invasiveness, reversibility and the conservative
19
20 evidence-based therapy.
21

22 - Only 6 (4%) of the 160 patients with the initial click were left stable; none (0%) with TMD
23
24 pain; none (0%) with muscular pain; 35 (28%) with headaches; 28 (34%) with cervical
25
26 pains; 29 (22%) with parafunctions. Therefore, very few subjects remained stable and
27
28 probably these had more complex or structural alterations, especially with regard to cervical
29
30 pains, which seem to be more related to regional disorders such as post-traumatic stresses or
31
32 stressed lordosis. In fact, we observed that patients who gained more benefit from our
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34 protocol are those presenting rectilinearization rather than patients with lordosis
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36 accentuation; so we underline a careful investigation of this region.
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39 - They have improved: 51 (32%) patients who had the click; 36 (33%) reporting TMD pains;
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41 32 (28%) with muscular pain; 29 (24%) with headaches; 26 (32%) subjects with cervical
42
43 pain; 101 (78%) patients who initially reported clenching and/or bruxism.
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45

46 - They have much improved with the total disappearance of the symptom: 103 (64%) 160
47
48 patients with the initial click; 73 (67%) who had TMD pains; 83 (72%) referring to muscle
49
50 pains; 59 (48%) with Headache; 28 (34%) with cervical pains.
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1 - Finally, the overall assessment of the remission of symptoms evidenced that 99 patients
2 representing 62% reported the joint disappearance of all disorders. This latest data, along
3 with data of improved and much improved patients, confirms that the Lingual Ring Device,
4 with the new protocol, is definitely valid for intercepting joint imbalances (click, TMD
5 pains, myalgia) resulting from possible occlusal alterations but, especially, from
6 neuromuscular stresses and problems. This conclusion is mainly confirmed by the
7 instrumental examinations carried out: magnetic resonance (MR of TMD) with and without
8 lingual ring in the mouth (Figures 4 and 5); electromyography at time 0 without device and
9 T3 after 3 months of use of the Lingual Ring; axiography with and without mouth device
10 that document the three-dimensional repositioning of occluded condyle.
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28 **Conclusions**

29 Overall, therefore, the conclusions of our study can only be positive, given the brevity of the
30 3 months of the protocol. The universal bite Lingual Ring, immediately available for the
31 patient and the clinician, combined with self-cure and exercises - counseling, behavioral
32 therapy and home-based and clinical exercises - (8-12), myo-behavioral gnathology (Fig. 1),
33 has proved to be an effective device for immediate treatment of TMDs.
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42 *Advantages and disadvantages*

43 After exposure of our data, it is important to expose the advantages and possible
44 disadvantages of this new therapeutic approach in a synthetic way.
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51 *Advantages*

1 The possibility of combining several therapeutic proposals in a more comprehensive plan,
2
3 namely: bite therapy, information and education therapy, physical exercise therapy and
4
5 myofunctional re-education, and behavioral therapy. Immediate use of the Bite Lingual Ring,
6
7 ready to use, for both the patient and the operator. Low cost of management both economical
8
9 and clinical; low biological invasiveness and the respect of conservative therapies. Reducing
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11 waiting times (often long), both in private practice and especially in public facilities. Ease of
12
13 management by the patient and the clinician. The involvement of the tongue in functional
14
15 rehabilitation therapy. Good tolerability and versatility. The possibility to have differential
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17 response on the different types of TMD, and then eventually to modify the continuation of
18
19 the therapeutic course differently. This latter aspect strengthens the logic of "conservative
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21 and low-invasive therapies", required by the scientific community, to maximize the benefit
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23 with minimal expenditure and only later on to articulate major therapies. In this regard, we
24
25 emphasize that all patients will continue to be monitored and those who are stable or only
26
27 improved will be re-evaluated and included in the program using specific therapies or
28
29 traditional bites.
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33 In addition to these advantages, there is the possibility by the clinician to administer the bite
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35 to patients who have completed dental prosthesis or rehabilitation treatments, to obtain a
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37 deconditioning and/or occlusal protection.
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41 *Disadvantages*

42 The disadvantages of this new device and the protocol are mainly related to the greater need
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44 for collaboration by the patient, who must learn how to handle the bite with a different
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46 strategy and timing. Other disadvantages can be the management of tongue posture, which
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48 becomes important in maintaining the device properly in the mouth.
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1 Obviously, the advantages and disadvantages are also related to the preparation and
2 management skills of the clinician. The present study, though on a population of 160
3 subjects, definitely needs further insights and a longer monitoring of clinical findings.
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15 units.
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NOTES

“The authors certify that there is no conflict of interest with any financial organization regarding the material discussed in the manuscript”

TABLES

Table I.— Absolute values (expressed as number of patients) of symptoms and responses before (start) and after application of Ri.P.A.Ra Lingual Ring protocol

Sample table I

	CLECKING	TMJ PAIN	MUSCULAR PAIN	HEADACHE	CERVICAL PAIN	PARAFUNCT.
Beginnin	160	109	115	123	82	130
Got worse	0	0	0	0	0	0
Stationary	6	0	0	35	28	29
Improved	51	36	32	29	28	101
Much improved	103	73	83	59	28	0

Patients that have much improved all the symptoms simultaneously = 99

Table II.— Percent values (compared to the number of patients) of symptoms and responses before (start) and after application of Ri.P.A.Ra Lingual Ring protocol.

Sample table II

	CLECKING	TMJ PAIN	MUSCULAR PAIN	HEADACHE	CERVICARL PAIN	PARAFUNCT.
Beginnin	160	109	115	123	82	130
Got worse	0%	0%	0%	0%	0%	0%
Stationary	4%	0%	0%	28%	34%	22%
Improved	32%	33%	28%	24%	32%	78%
Much improved	64%	67%	72%	48%	34%	0%

Patients that have much improved all the symptoms simultaneously = 99 = 62%

TITLES OF FIGURES

Figure 1.— New therapeutic protocol with the Lingual Ring Ri.P.A.Ra.

Figure 2.— The parts that constitute the bite Lingual Ring Ri.P.A.Ra.

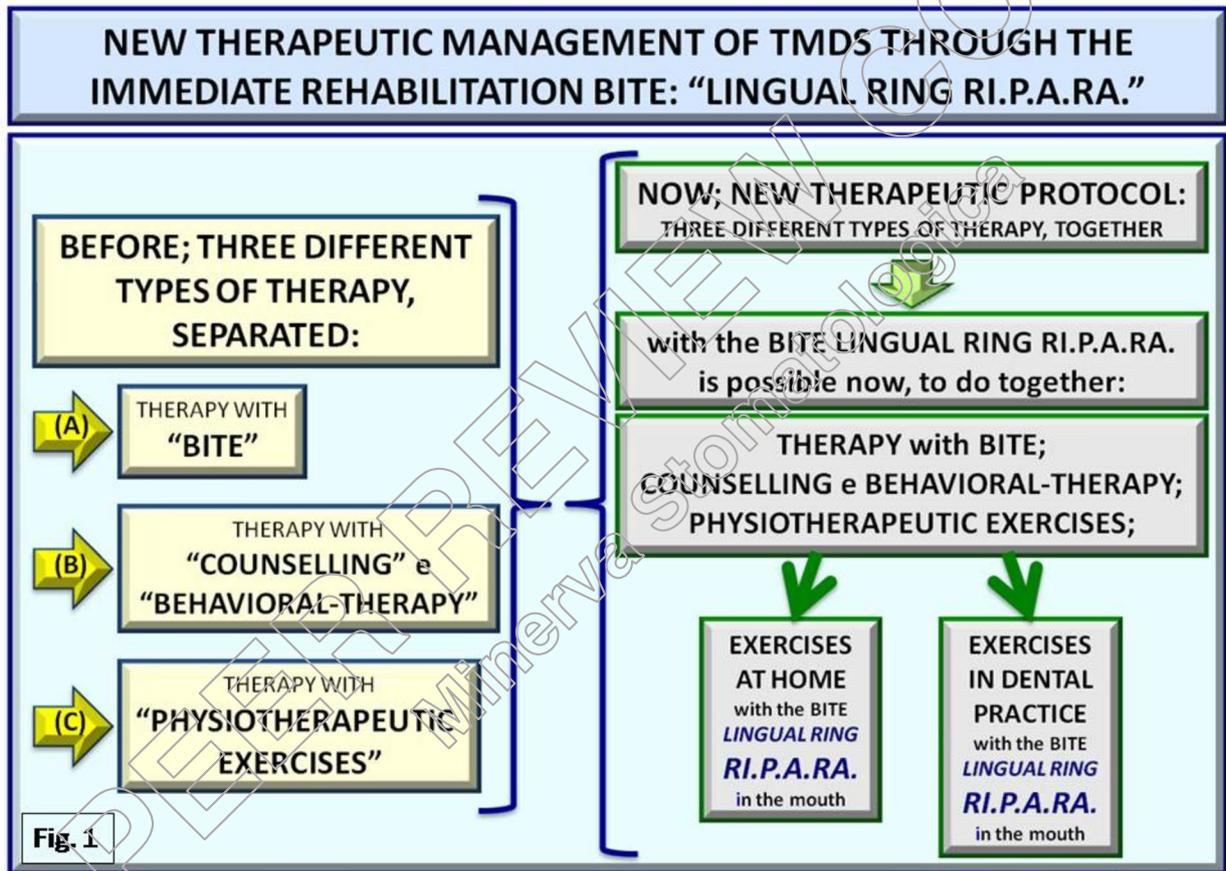
Figure 3.— Diagram of the correct position of tongue and bite Lingual Ring Ri.P.A.Ra.

(sagittal view).

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2 Figure 4.— Above: Magnetic resonance without the bite Lingual Ring Ri.P.A.Ra. in the
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5 mouth with dislocation of the disc. Below: Magnetic resonance with the bite Lingual Ring
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8 Ri.P.A.Ra. in the mouth without dislocation of the disc.
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15 Figure 5.— Correct positioning in the mouth of the bite Farrar and the bite Ri.P.A.Ra. Note
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18 the different position of the tongue.
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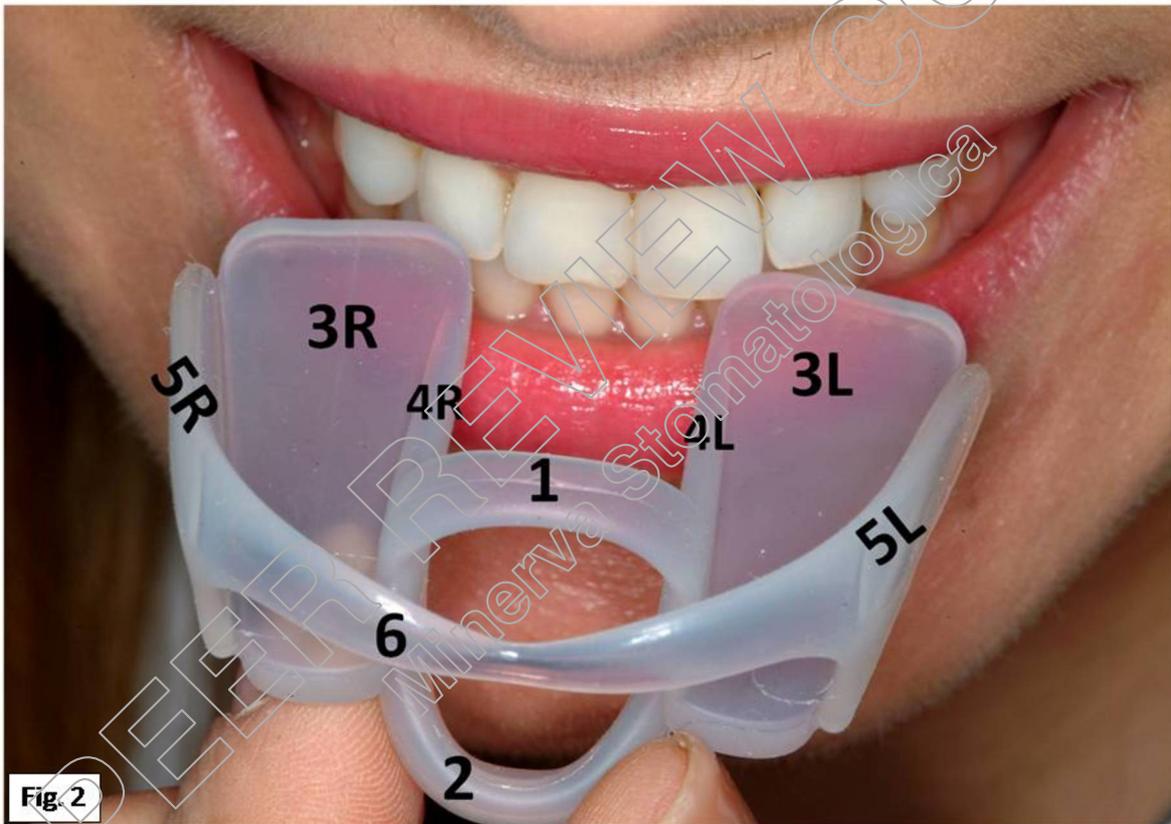
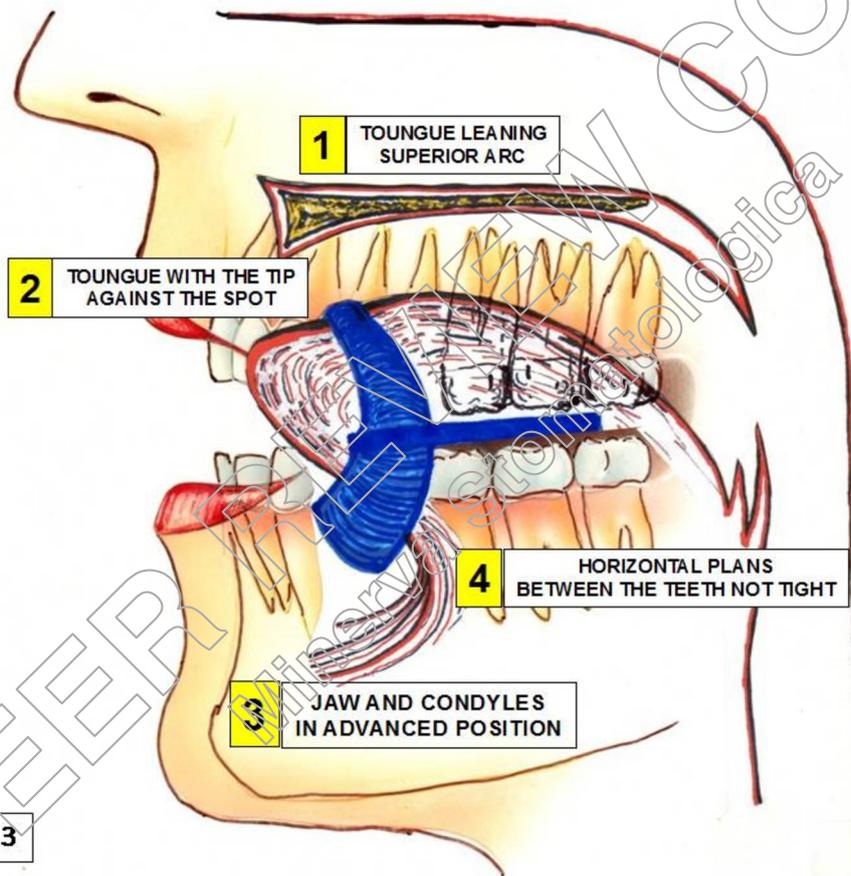


Fig. 2

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Fig. 4

With Lingual Ring in the mouth, observe the anterior protrusion of the condyle; Recapture of the disc

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Fig. 5

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