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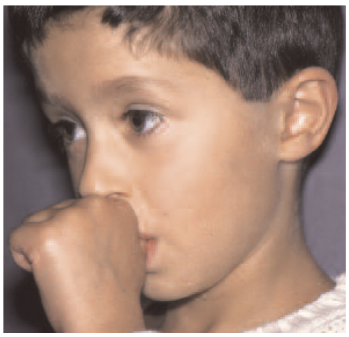
A History of Behavioral Therapy



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ABSTRACT

Behavioral therapy (or myofunctional re-education) acts on the central nervous system and not directly on facial tissues like other orthodontic treatment. This therapy was developed in two stages: first, orthodontists identified the role played by muscular pressure on the shape of dental arches (Blandin[4], 1836), then by the elaboration of remedial treatment of malfunctions as well as the elimination of parafunctions (Johnston[20], 1938). The School of Stomatology introduced these treatment methods in France in 1950.

KEY WORDS

History of orthodontics,

Malfunctions,

Parafunctions,

Rehabilitation.

1 – INTRODUCTION

Knowing the history of behavioral therapy in orthognathodontics allows the practitioner to clearly define this type of treatment and to distinguish it from other therapeutic modalities with which it may be intermingled in practice but it should not be confused with them, given the specificity of its application.

Behavior therapy or myofunctional re-education ''acts on the central nervous system to correct malfunctions, to eliminate parafunctions and, more generally, any behaviors or postures which disturb the morphogenesis of the dental arches''[32].

We should remember that malfunctions are functions that are poorly executed. In the oro-facial area, these malfunctions primarily affect swallowing, mastication, occlusion, pronunciation, and ventilation. ''The parafunctions are repetitive, compulsive actions that add nothing to the well being of the patient but can interfere with correct morphogenesis of the arches or alter the performance of TMJ. The most common

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parafunctions are bruxism, nail biting, finger or thumb sucking, and tics''[32].

To this list of malfunctions and parafunctions negatively affecting the dental arches we should add problems with general and cephalic posture as well as poor sleep posture[34].

Behavior therapy has frequently been called ''functional therapy'' but this misnomer should be dropped. The term is imprecise because thumb sucking and nail biting are not functions and the use of this designation for them causes confusion. Functional therapy, the brainchild of Robin and Andresen, is a treatment that changes the trajectory of the closing of the mandible by using a passive apparatus (a monobloc or activator) and is intended to modify the form and the relation of the osseous bases. The name of this therapy is recognized and known worldwide.

Behavioral therapy should also not be confused with myotherapy, first proposed by A. Rogers in 1918 whose goal was to strengthen certain muscles (the orbicularis and the propulsors and elevators of the mandible) by having patients perform appropriate exercises. Myotherapy, unlike re-education, does not modify the role of a function. Myo-therapy, which gained favor among the orthodontic elite in the 1930s, is no longer practiced today. However, certain exercises, like those involving the orbicular muscles, have been incorporated into behavioral therapy.

In its development, behavioral therapy went through two major stages. First, it took more than a century for orthodontists to understand how soft tissues affect the morphogenesis of the dental arches and how they can occasionally cause pathological defects. Secondly, practitioners came up with successful procedures to modify muscular movements when they proved to be harmful to patients.

2 – RECOGNIZING THE MORPHOGENETIC ROLE OF SOFT TISSUE

In 1805 Gariot[16] wrote the very first sentence recognizing the morphogenetic role of soft tissue that we have been able to find in orthodontic literature: ''the other (tooth) slowly returns to its proper place in the arch by continual pressure of the lips or the tongue''. In 1812, Sauvé[30], while examining a case of prolapse of the tongue, remarked: ''the incisors and the inferior canines are pushed out due to the constant pressure exerted by the tongue''. Neither Lemaire[22] nor Oudet[23], who had both studied the causes of ''irregularities of the teeth'' extensively, makes the faintest allusion to the role of soft tissue. This omission makes the valuable contribution that Philippe Blandin[4] even more amazing, when, in 1836, he pronounced the principle of muscular equilibrium: ''the lips, the cheeks and the tongue work together to make the teeth align in the intended positions''. ''We can state then that the teeth are naturally positioned between two forces that push them in opposing directions: one from the outside pushing them in, the other from the inside pushing them out. The equilibrium of these two forces determines

in part the vertical orientation that these organs display in humans.''

Most practitioners were unaware of Blandin's comments, except for Désirabode[9] (1848) who mentions ''two forces between which the teeth are placed, i.e. the lips which retain them from the front and the tongue which holds them in place from behind'', Lefoulon,[21] who blames thumb sucking for pronunciation problems and Schang[31] who noted ''the impact of the lips, cheeks and tongue, due to their mutual opposition, on the vertical orientation of the teeth of man.''

But, in 1873, when Blandin's concept had almost been forgotten, the Englishman Charles Tomes[40] brought it up again and explained that ''the V-shaped arch is formed due to respiration passing through the mouth''.

The brilliant practitioner Kingsley assessed Tomes' comments but remained unconvinced. Farrar, in his 1500 page book does not even mention soft tissue, and Talbot's work has the title ''Mouth breathing does not cause narrow arches and deep palates.''

Despite the negative tone of these writers, the idea gained adherents little by little and, at the beginning of the 20th century, the innovator, E. Angle[1] attributed a certain etiological role to finger sucking, repeated lip, cheek, and tongue biting and also to nasal obstructions. Having stated this, Angle did not propose any treatment for these ''bad habits''. Instead, he simply referred the most serious cases to an E.N.T. specialist.

Despite all these observations, neither the American C. Case[5] nor the Frenchman L. Frey[13] cited behavioral problems among the causes of malpositions of teeth. Even worse, Gaillard[15] denied the role of ''muscular actions'' in creating malocclusions.

But, in spite of these skeptics, the list of those who, from the beginning of the century, were convinced of the morphogenetic importance of soft tissue grew longer every day. We cite, among many others: Lisher, Bogue, Friel, Pont and Robin.

3 – THE BIRTH OF BEHAVIORAL THERAPY

In the United States, several orthodontic pioneers asked what exactly a habit was, how it formed and what its place was in the nervous system.

These forerunners, Johnson[19] (1913), Wilson[43] (1927) and Swinehart[38] (1927), proposed exercises to correct these bad habits, but they were either coercive or derived from myotherapy rather than from physical therapy for harmful behaviors.

Cooperation between orthodontists and psychologists led to decisive progress. J.H. Furby[14], a psychologist, defined a habit as the tendency of a nervous impulse to follow the most frequently used trajectory. His greatest accomplishment is to have been the first to talk about ''physical therapy'' and to express an awareness of a position or movement. He concluded by saying ''habits of the

nervous system must be corrected by using physical therapy or by changing the mental state of the patient.''

B. and F. Truesdell[41], in 1937, precisely analyzed normal and abnormal swallowing and indicated some procedures for correcting it. But, they focused exclusively on malfunctions of the tongue.

Leland R. Johnson[20] synthesized and harmonized all these approaches in 1938. He examined, different malfunctions one by one, looked for their causes and described the treatment he used: exercises, and aids such as tongue screens and rewards for cooperative patients. He was frank about the difficulties that he encountered.

We have a real sense of the practitioner wrestling with the reality of many different clinical situations.

If certain procedures, like tongue spikes, are debatable; others are based on sound psychology. The orthodontist does not deal harshly with thumb suckers, but instead offers them boxing gloves and then plays with them in such a way that these ''future champions'' want to go to sleep wearing the gloves.

4 – THE DEVELOPMENT OF BEHAVIORAL THERAPY

In 1938, psychologists established the basis of behavioral therapy. During the following years, they came up against fierce criticism. But behavioral therapy withstood the attacks and the need for it became even greater as a multitude of studies on the etiological role of malfunctions appeared buttressed by clinical observations of its effectiveness.

• **In 1943,** Angle's student, R. Strang's[35] book was widely read and contained a review of morphological disorders caused by malfunctions and a detailed presentation of procedures for treatment using physical therapy.

• **Beginning in 1946,** the English school (Rix[27], Ballard[2], Tulley[42], *et al.*) began to publish important works concerned with notably the role of the tongue and the orbicular muscle of the lips in determining the position of the incisors. For these authors, this behavior is endogenous (innate) and cannot be modified even if it leads to an abnormal position of the incisors. In order to be stable, mechanical treatment can only place the teeth where functional play permits. Physical therapy is inefficient and, therefore, useless.

• **In France,** the School of stomatology (Cauhépé, Coutand, Fieux, Bouvet[6]) was the major influence and from 1955 reaffirmed the etiological role of muscle imbalance. The school refined the clinical examination and explained treatment for discomfort associated with certain malocclusions[7,10]. The orthodontists stressed ''reflex physical therapy'': ''It is not myotherapy, we are not trying to strengthen the muscle, but rather treat nervous muscle control directly.'' (Cauhépé[7]). The practitioner must make the patient conscious of the muscle reflex, then teach the child to execute a very simple but correct movement ... immediately,

the examiner sees that all the abnormal muscular synergies disappear and progressively, a normal reflex takes place'' (Cauhépé[7]).

This concept heavily influenced French practitioners (M. Chateau, H. Muller), even if they did not completely stop using mechanical apparatuses.

- In 1970 and 1973 D. Subtelny published two brilliant papers detailing experimental treatments that showed that orthodontists only used physical therapy, it did not modify the shape of the arches or change the deglutition of patients as assessed by cineradiography. Whereas, when using only mechanical procedures, practitioners modified function. Subtelny concluded: ''The specific pattern of muscular activity associated with deglutition is dictated principally by form.'' Here, he refutes behavioral therapy treatment.

W.R. Profitt[25], who agrees with Subtelny, is convinced that ''the shape of the arches dictates the functional operation of the tongue and the lips, much more than these same functions change the shape of the arches. And, to the extent that the form of the arches is influenced by soft tissue, the positions of the tongue and the lips at rest appear to play a much more crucial role than pressure from deglutition and phonation.''

- **Beginning with the 1970s,** R. Ricketts[26] and his disciple C. Gugino[18] have attributed increasing importance to soft tissue. They move teeth mechanically without ever losing sight of the tissue that envelops them. Therefore, mechanical methods are used to bring about the ''unlocking'' of occlusion that liberates mandibular and lingual functions. Similarly, mechanical procedures can close an open bite, in order to allow for physical therapy to succeed. But without initial morphological correction, physical therapy is impossible and without physical therapy, there can be no stable correction.

The concept of a strong connection between behavioral therapy and mechanical treatment was highly successful. The connection was reinforced and completed by numerous publications, most notably by D. Romette's[29] articles and A. Chauvois's[8] book.

This notion of combined procedures was extended to mouth breathing. The writings of J. Talmant[39] showed the respective indications for medical, surgical, orthognathodontic and behavioral treatments and their synergies.

Orthodontists more commonly used devices such as retainers (D. Rollet[28]), because it was easier to have patients wear them for periods of time than to have them regularly do tedious exercises, but it is not clear whether these devices are as efficacious for all patients (Fournier[12]).

5 – SPECIALISTS

Physical therapy for malfunctions and harmful postures requires know-how, a significant personal investment and a lot of psychology. Since orthodontists were not trained in behavioral therapy, they turned to specialists,

frequently kinesitherapists or speech therapists who applied their expertise to orthognathodontic problems.

Three of them published their procedures and explained their treatment.

• **Barrett**[3], backed by years of experience, was opposed to the theories of the English School as early as 1961. For him, the mode of deglutition was determined by heredity in only 10% of cases. In 76% of cases, disorders of deglutition were remedied and stabilized. Barrett discusses his collaboration with the orthodontist and explains his methods of treatment.

• **D. Garliner**[17] published a work in 1971: ''Myofunctional Therapy in Dental Practice'', which is a veritable guide for treatment. It deals chiefly with disorders of deglutition. Garliner explains what causes them (often related to baby bottle use), offers diagnosis, therapy (after justifying it), and the results. Exercises are described and he provides a checklist.

• **M. Fournier**[11,12], drawing heavily on guidance from J. Delaire and also from his own many years of experience, represents French thought concerning behavioral therapy. Its main focus is on the critical importance of body and head posture.

6 – CONCLUSION

Behavioral therapy is one of the methods used for treatment in orthognathodontry. Its main principle is to deal directly with the nervous system and not with facial tissue as other methods do. Behavioral therapy can be used in isolation or, as most often is the case, with other therapeutic procedures.

The role of balance in soft tissue and the morphogenesis of the dental arches were first explained by Ph. Blandin in 1836. But treatment for disturbances in this balance only appeared in the United States around 1938. This therapy was introduced in France by the school of Stomatology in 1955.

Today, behavioral therapy continues to grow:

– by proposing preventive measures intended to encourage healthy behaviors vis-à-vis food, ventilation, pronunciation and posture;

– by improving physical therapy techniques thanks to the contributions of kinesitherapists and speech therapists who are playing an increasingly larger role in the application of this therapy;

– by fully recognizing the importance of cephalic posture (Solow[33], Gugino[18], Fournier[12], Pachi[24]);

– by relying more and more on psychotherapy.

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