

Occlusodontology and Orthodontics

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Introduzione

The term "occlusion" is defined, medically, as "the state of closure"
The term "occlusodontics" is applied to all treatments which attempt to resolve dysfunction and the associated malocclusions which are responsible.

The term "occlusodontology" is a way to consider the practical dental therapy which perfectly respects the stated rules of Physiology, Anatomy and Human Neuro-physiology. Consequently, occlusodontology is not only a « speciality reserved for its practitioners », but preferably, is something which should concern all general practitioners and specialists concerned with oral function. Occlusodontology will be never a speciality. (1)

The Mixed Dentition Phase.

The eruption of the permanent teeth occurs between 6 and 12 years, each dental exchange (of deciduous and permanent tooth) following its own individual timescale. Each year, between 6 and 12 years, the order of eruption is as follows (dental age): the first permanent molar (6 yo teeth), central incisor, lateral incisor, first premolar, canine, second premolar and second molar (12 yo teeth); wisdom teeth do not make their appearance until between 18-25 years, if they are present. By modifying the mesio-distal diameter of the neighbouring deciduous teeth (slices), dental eruption can proceed in the most favourable conditions. At 12 years old (legal age) the fundamental permanent teeth are present and the patient can be considered "adult" from a dental perspective. In terms of hygiene, both dental and masticatory, each patient at 12 yrs old must be responsible for themselves.

Muscular Neuro-Physiology

Positioning the teeth into occlusion follows a closing reflex especially in the course of salivary swallowing.

During all other functions, such as speech and mastication, the avoidance reflex (or opening reflex) protects the constitutive elements of the masticatory apparatus. In regard of the Neuro-muscular Physiology rules, closing reflex and avoidance reflex are not the same and opposite.

In muscular physiology, we learn that all muscle must pass through a relaxation phase

which lasts at least as long as the muscle activity phase. Each phase of relaxation permits metabolic regeneration of the muscle.

In the case of muscular adaptation to occlusal interference, the phase of muscle relaxation is cut short, to the detriment of this metabolic regeneration. There is as a consequence, an accumulation of lactic acid within the muscle, the lactic acid induces the symptoms of muscle cramp. All muscle cramp is painful. Consequently, orthodontic treatment must also respect this relaxation phase of muscle physiology.

Aesthetic dentistry and Masticatory Function.

Aesthetics are a major preoccupation for our patients. Orthodontists define aesthetic criteria through which they choose between diverse appliances, both fixed and removable. According to the complexity of the treatment demands, the intervention of other medical specialities and maxillo-facial surgeons is sometimes required. A general rule of occlusodontics is specifically due to the aesthetic demands of our patients:

«That which is most beautiful is not necessarily most functional».

Functional Salivary Swallowing (FSS).

Functional Salivary Swallowing (FSS) is the most neuro-physiologically neutral manner of swallowing, 1500-2000 times per day, the one and a half liters of saliva normally produced by the salivary glands. At the precise moment that the tongue rises to crush itself against the hard palate, the maxillary and mandibular teeth are in occlusion, thus permitting the muscles of the floor of the mouth to provide, by their contraction, a solid base for the tongue.

This phase is essentially totally dependent upon reflex action, which is never under conscious control. All interferences, however minimal (0.001 metric millimeter on an occlusal surface of a teeth is sufficient), upon these reflexes will induce muscular adaptations and a Dysfunctional Salivary Swallowing (DSS) (called «secondary» type, through secondary interference).

Dysfunctional Salivary Swallowing (DSS), « Primary » and « Secondary » reflex.

Dysfunctional Salivary Swallowing (DSS) is a pathological manner of swallowing the normal saliva secretion. It is accompanied by the interposition of the tongue (by a greater or lesser amount) between the two dental arches, and an adaptation of both the masticatory musculature and the cervico-facial posture. This adaptation is detrimental to the regenerative metabolic phase of the muscles.

Consequently, muscle fatigue is induced, (sometimes causing symptoms), by the patient's permanent teeth.

During suckling, swallowing is also accompanied by an interposition of the tongue between the dental processes, but it is progressively transformed into a FSS by the eruption of the deciduous and permanent teeth. In the absence of this neuro-physiological transformation of swallowing, the DSS, called «primary», becomes

entrapped in orthodontic treatment and gives rise to what is commonly called «orthodontic relapse».

Whether the DSS is «primary» or «secondary», the relevant statistics demonstrate that almost three-quarters of the population suffer, to varying degrees, from this form of pathological salivary swallowing.(2) (3)

Occlusodontology and Orthodontics. (4)

The common objective is «to establish and maintain a functional relationship between the occluding teeth». To fail to recognize that

Occlusodontology and Orthodontics are complementary to one another is to risk failure. From a functional point of view, the resulting tooth approximation during the orthodontic treatment will induce some failures at each time that the adaptation is not able to help the practitioner, and it is often the case.

We understand the harmfulness of a canine disocclusion (0.001 metric millimeter is sufficient), when the arches are in intercuspidation, or when there is movement of diduction. We know that this disocclusion however mild is responsible for bruxism, parafunction which leads to dysfunctional musculature and the appearance of symptoms. We could see that the merest amount of coronoplasty would, at the conclusion of orthodontic treatment, easily help to avoid of this complication. Post-orthodontic relapses are mostly following a course of treatment, which has not paid sufficient attention to the linguo-mandibular dysfunctions as DSS, which are in general responsible for dento-maxillary or dento-dental disharmonies. The linguo-mandibular dysfunctions are often spectacular and should not pass unnoticed. All the dysfunctions coincide with the development of the power of the lingual musculature, which is not opposed by the lack of muscle tone of the lip muscles due themselves to the dysfunctional swallowing (DSS) associated with mouth breathing (5) (6) (7).

Swallowing with teeth "non-clenched" is mainly responsible for the hypotonicity of the elevator muscles of the mandible : the patient don't like to clench his tongue. The dysfunctions are, of course, detected and made the subject of a reeducation of the patient (Functional Myo-Therapy or FMT), which, unfortunately, is very rarely effective. This is sometimes, certainly, a result of the child's negligence, but the most common cause is the uncertain qualifications of the auxiliaries who are in charge of it. An other reason is also the advanced age of the patient or an ignorance of the practitioner. Much remains within their domain. At the beginning and always eventually during orthodontic intervention, FMT must be used to restore the forces between the different groups of muscles , especially when education of saliva swallowing is conducted in parallel (8) (9) (10) (11).

If the first molars are not already in a good position with their contact antagonists, and especially if the deciduous molars have

already been lost, a Jeanmonod's bite plane will assist the child in training his swallowing to be «teeth clenched» (FSS), favouring the progressive establishment of a functional Occlusal Vertical Dimension (OVD) also avoiding the creation of a molar which never erupts into proper occlusion (litterally translated: « molar infragnath »). Romette (12) wrote that the «Jeanmonod's bite plane aids with the suppression of the parasitic muscle synergy, the lingual interposition by projection, hyper contraction of the genioglossi,

and sucking in of the lips and cheeks». Any anomaly of the origin of the lingual frenum will hamper the acquisition of proper swallowing. It is necessary, if the frenum is too short, to section the frenum, even, in certain cases to section its hypertrophy mandibular fibrous attachment. » (13) (14)

« One should only intervene with that which one can see » (15)

« What one cannot see one cannot understand » (15)

Conclusions.

All orthodontic treatment must take account of the imperatives of occlusodontology. It is simply the price to be paid, by all orthodontically treated patients, who would aspire: «to die, at a ripe old age, with all their teeth».

A beautiful car is not enough for most people: it must also be functional and durable.

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