

# ASPECTS OF THE PROGNOSTIC OF FIXED AND MOBILE IMPLANT DENTURE STRUCTURES

D. CHIRU<sup>1</sup>

“Titu Maiorescu” University of București

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**Abstract:** Implant denture structure is supposed to revolutionize dentistry in general, but especially in prosthetic dentistry. The development of this speciality, in a quite short period of time, requests much care, even caution. Because the evolution and prognostic of the treatment depends on the three specialists and the state of nourishment of hysto-morphological structures of the patient, it is recommended that a very good cooperation between the implantodontist, prosthetist and dental technician should always exist. It is possible that the occlusal factor represented by the static and dynamic relations between the two dental arches to participate positively or negatively to the implant denture structure work prognostic. In this article, I tried to present the evolution concept about the so called occlusion philosophy, as well as the authors 'concerns who contributed to the elucidation of the fundamental elements.

**Cuvinte cheie:** implantologie dentară, supraprotezele dentare, specialiști

**Rezumat:** Se afirmă că protezele supraimplantare au revoluționat dentistica în general dar în special protetica dentară. Dezvoltarea acestei specialități, într-o perioadă de timp relativ scurtă, impune să se manifeste multă atenție, chiar prudență. Deoarece evoluția și prognosticul tratamentului depinde de cei trei specialiști la care se adaugă starea de troficitate a structurilor isto-morfologice ale pacientului, întotdeauna se recomandă să existe o colaborare ideală între implantolog, protezist și tehnicianul dentar. Factorul ocluzal, reprezentat de relațiile statice și dinamice dintre cele două arcade dentare este posibil să participe pozitiv sau negativ la prognosticul lucrării protetice supraimplantare. În cuprinsul articolului sunt prezentate evoluția conceptelor despre așa zisa filozofie a În concluziei și preocupărilor autorilor care au contribuit la elucidarea noțiunilor fundamentale..

The restoration of dental arches by means of fixed and mobile denture supported on implants, requires the participation of three specialists: implantodontist, odontologist and dental technician.

The activity is complex and implies different responsibilities and the evaluation of both their importance and differences are not always easy to be performed, as between all these procedures there are correlations that may influence one another. If the implants are osseointegrated and if the implant dental structures are not appropriate, inflammations of peri-implantar soft tissues and implants movement are possible to appear.

The peri-implantar soft tissues are inflamed due to the proper surgery procedures and they appear premature.

Inflammations, that appear tardily, set slowly, gradually, are determined by multiple causes and are classified into two categories:

- the first category is represented by inflammations due to implant denture structures in its relation with peri-implantar aria.
- poor hygienic conditions of oral cavity, together with tissues low state of nourishment, infections predisposal, alimentary deficiencies.

Osseointegrated implants lack of stability, after variable periods of time, from the moment of implant denture structure loading, is depend on , especially, the static and dynamic occlusal relations of the two dental arches.

Dental contact that appear directly between teeth occlusal faces of the two arches or by foods during mastication, are considered to be determined causes, with major potential, frequently rendered evident, being noticed both in the practical activities and described in specialty literature.

The occlusal relations were studied by very many specialists, to explain all modifications appeared at the level of anterior determinant.

**The chronological description of the performed studies regarding the mandibular dynamic and occlusal relations.**

These occlusal relations represented, in a certain past period of time, an important chapter of dentistry, being considered “the philosophy of dentistry” and, as it implies many correlations, for which memory and imagination should have been present and active.

Step by step, in time, the fundamental concepts have been explained more and more clear, due to a proper vocabulary, that refered to morphological elements of dental-maxillary apparatus.

Recently, Hegel’s dialectics laws have been applied, that present the correlation existing between the phenomenons or between the form and function demonstrated by the mutual influence.

The study of occlusal relations has had the aim to restore by prosthesis, not only strictly the affected aria but also, the integrity of dental arches and that of the whole dento-maxilar apparatus (stomatognathic system) to obtain the

<sup>1</sup>Corresponding Author: D. Chiru, “Titu Maiorescu” University of București 67, A Gheorghe Petrașcu street, sector 3, Bucharest, cod 031593, e-mail: medicina@utm.ro, tel +40-(21) 325.14.16

## CLINICAL ASPECTS

automatized neuro-muscular occlusion.

The concerns value for the study of occlusal relations is exemplified by the data presentation existing in specialty literature, with historic character.

In 1880- the first occlusor was imagined.

In 1855 Bonwill elaborated the theory of balanced occlusion and created an articulator with the inferior arm, mobile.

In 1887, Von Spee and Wilson introduced the compensating curves in saggital and transversal plans at the level of occlusal faces of the dental arches.

In 1887, Walzer pointed out the presence of condylar slopes.

In 1898, Monson imagined the spherical occlusion, occlusal faces of dental arches form a sphere in accordance with Von Spee curves.

In 1900, Champon imagined and demonstrated the presence of terminal hinge axis.

In 1905, Alfred Gysi studied mandible movements in the moment of masticatory function and simultaneously he defined the active part or working part and the balancing (swinging) or inactive part. At the same time, at condyles level he specified the existence of the rotation movement combined with that of translation on the articular tubercle slopes.

Mandible movements in horizontal plan were inscribed intraoral and was obtained a characteristic shape named Gothic Arch – it indicates the mandible's positions in retropropulsion (RC), in maximum propulsion and in maximum left and right laterality.

In 1907, Bennet, after the performed studies, he discovered the lateral mandible movement, described at the level of the two articular condyles.

In 1921, Haren and later Thileman, states the concept of organic occlusion.

This concept has five correlations that must exist at the level of this type of occlusion (organic occlusion).

The morphological correlations are:

- Inclination of articular tubercles slopes;
- Inclination of retroincisal plateau (represented by the morphology and inclination of oral faces of the front teeth group on which the incisal edges of the inferior frontals slide);
- cupid's height;
- Inclination of their sides and slopes (from the level of lateral teeth);
- Von Spee's compensation curve.

In 1926, Mc Collum together with Stuart and Stallard is the founder of Gnathology School of California.

As per this School, Gnathology means dentistry.

Mastication is simulated by means of an instrument named gnathoscope.

Mc Collum stated the followings:

- Mandible movements are oriented by temporomandibular joint;
- Mandible is not guided by teeth;
- Condylar slopes are fixed and can not be changed;
- Mandibular lateral movements must not be deviated or stopped by teeth presence.

Hildebrand in 1931, and Curt in 1942, made a negative comment regarding the simulators accomplished to imagine the mandible movements.

The masticatory function performed by each person is totally different of that performed by the imagined, realized and used instruments and devices. This concept was adopted also by Stuart, but especially by Robinson in his publication "The Theory of Muscular Reflexes", where he stated the following:

the temporomandibular joint does not represent a support point of the system because it is not an effort joint, the posterior-superior wall lacking of spongous bone, but it is a thin bone, a blade, that represents only a guidance of mandibular movements.

Sigurd and Ramfyord, based on prior data, introduced a electromyogram in order to study the value of neuro-muscular component within dento-dental relations of dental occlusion.

In 1957, Mc Collum has accepted, on basis of new studies, that centric relation is a repeatable position –but determined only by operator's comfort.

Stuart and Stalard, Mc Collum's ex pupils, adopted Hannau's concept regarding the organic occlusion, stated in 1921 (with the five correlations).

At this concept acceded also other authors represented by: D'Amico, Martignoni, Thomas, Celenza Lundeen, Slavick and so on.

The principles of the new trend consist in the following statements:

- Posterior teeth protect the anterior teeth and anterior teeth protect the posterior teeth (mutual protected occlusion);
- Posterior teeth presents two types of cuspids: cutting cuspids and impression cupid's;
- Mastication is performed by a movement, occlusion and disocclusion;
- Masticatory cycle is guided by morphological structures of temporomandibular joint under the action of neuro-muscular motor unit, generally in vertical direction;
- Complete occlusal contacts at cupid's level are produces only in centric relation position;
- Cutting cupid's act like scissors blades, through gliding;
- Masticatory function is efficient through participation of the three components of dento-maxilar apparatus represented by the following morfo-functional structures:
  - teeth of both dental arches forming the anterior determinant;
  - mobilization muscles of mandible;
  - temporomandibular joint represented by all tissues.

These components used for food trituration act are under the subordination of neuro-vegetative system, prevailing reflex but also conscious (voluntary).

In 1957, Posselt inscribed mandibles movements in all three plans and demonstrated that maximum intercuspals may appear also anterior in respect of terminal hinge axis, also deglutition, in these clinical situations, appear more anterior of hinge axis of the two articular condyles.

After Bonvil, the researchers that studied the occlusal relation

(occlusion) can be divided into two categories:

- the mechanists give importance to morphological structures;
- functionalists, for them function is the main element of dento-maxilar apparatus.

Nowadays, practical activity must be correlated, functional morphological structure, being known, the organ creates function and function maintains the organ.

After 1960, Pound remarked himself, due to his functionalist attitude, because he used phonemes in order to determine anterior teeth position and then he indicated the vertical dimension of occlusion.

In 1968, Bernard Jankelson asserted the theory of functional occlusion being explained by a personal research method of neuro-muscular system. He realized the device known as kinesiograf and together with electromyograph using

the variations of electrical tension within the study for enouncing the theory of neuro-muscular occlusion.

Jankelson demonstrated that the masticatory act takes place in three steps represented by: incision, mastication properly and deglutition. More over, he demonstrated that only deglutition represents the single moment when there are maximum multiple dental contacts - .

So, suprahyoid muscles can realize the necessary functions of hyoid bone to perform deglutition.

Jankelson introduced the notion of mio-centric occlusion – occlusion centered on muscle contraction.

More over, Jankelson explains many data regarding premature contacts and developed the technique of their removing. “being imagined the concept of crownplasty”.

The kinesiograph has the role to monitorize and measure each step of the muscular dynamics.

Bernard Jankelson stated the followings: ”If the muscular contractions were measured was a fact, if they were not measured was only an opinion”.

In 1981, the Italian Academy of Kinziography and Cranio-mandible Electromyography was established, took back and developed Bernard Jakelson’s stated and supported concepts that were transferred from mobile to fixed prosthesis.

The importance of the receivers present in morphological structures of dento-maxilar apparatus.

This role must be analyzed in all clinical situations, but especially for the steps when are performed prosthesis restorations at the level of dental arches.

Receivers’ physiology has an essential importance in the occlusal relations of the two dental arches and not the mechanic of joints, as *mechanistic theory* has many deficiencies from physiologic point of view.

Dental arches restorations concern not only the dento-maxilar apparatus and will influence directly neuro-muscular system.

In morphological structures of dento-maxilar apparatus there are the following types of receivers: touch, pression, heat and intradental receivers (teeth tissues and from dento-parodontal system), receivers of temporomandibular joint, proprioreceivers connected with those olfactory, visual and auditory and receivers from the level of salivary glands.

Nocireceivers are sensors divided in three main groups: for heat stimuli, for mechanic stimuli and chemical stimuli).

Intradental receivers transmit heat- touch-press-osmotic stimuli.

Parodontal receivers are mechano-receivers being present on all dental structures. Each tooth receiver gives information regarding the type of pressure and direction of occlusal forces.

All the receivers give information regarding the forces and dental contacts positions.

All receivers from the level of dento-maxillar apparatus are present in a bigger number in comparison with other arias of the body – are the sensitive receivers (Bernard Frogel).

The receivers sensible at the heat variation are divided into heat receivers for cold and for warm.

Mechanic parodonto-dental receivers participate at maximum intercuspidal, represent the moment when maximum contacts exists. According to these data, maxim intercuspidal is determined by neuro-muscular and not by mechanical system.

If condyles movements were imagined on apparatus, they are not equivalent with mandible moments, because these are determined by totalization of the forces practiced by single muscle fascicles.

Mandible movements are performed to realize fonation, mastication and deglutition.

Fonation develops without dento-dental contacts between the two arches.

During mastication, initially were not dental contacts, gradually, through food trituration, dental contacts begin to appear.

In deglutition, there is a maximum of dental contacts.

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