STRATEGIES OF ORAL REHABILITATION IN THE DISFUNCTIONAL SYNDROME OF THE STOMATOGRANATE SYSTEM

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Abstract

The treatment strategies applied for rehabilitating the disfunctions of the stomatognate system aim at reducing or even eliminating pain, at re-establishing functionality within the normal limits of the stomatognate system and, last but not least, at improving life quality. The therapy of condylian repositioning is complex, being applied in several steps, by numerous techniques, whose benefic effects may be increased by a timely establishment of the diagnosis, quick treatments, association of prophylactic therapies with the curative etiological and symptomatic ones, and strict observance of the indications of the multidirectional treatment schemes. Re-establishment of morphological and functional harmony and equilibrium among the elements of the stomatognate system appears as the main objective of stomatological therapies. The school of Iaşi, created by prof. dr. Vasile Burlui, brought an important contribution to the establishment, systematization, recognition and tracing of the signs, symptoms and therapeutical schemes of the cranio-mandibulary malrelations. A simultaneous approaching of all factors of interest, elimination of risk factors, a most rigorous application of the treatment schemes, interdisciplinary cooperation (gnatologist, prosthetician, surgeon, orthodontist, ENT specialist) appear as guide marks of the therapeutical schemes for rehabilitation of the condylian position.

Keywords: oral rehabilitation, disfunctional syndrome, stomatognate system.

1. INTRODUCTION

The deep implications of the occlusal interarcadic relations and of condylian position both in diagnosis establishment and, mostly, in the success of any stomatological treatment, prevent rehabilitation of any element of the stomatognate system, while neglecting the centric occlusal points and the centric position of mandibulary condyles [1, 2]. Under certain clinical conditions, the therapy of occlusal re-equilibration and condylian repositioning is necessary as early as the phase of diagnosis establishment, the decision in this respect representing an important moment, on whose correctness depends the selection of the individual treatment of functional recovery to be followed, for assuring a total and optimum management of the patient [3].

2. MATERIALS AND METHODS

The clinical study was performed on a group of 63 patients, their evaluation from the perspective of the objectives had in view being done both during the stomatological treatment and along the hospitalization period.

The results obtained provided the necessary data base, statistical processing of dats being performed with the Microsoft Excel programs.

Distribution on sexes of the study group – including 36 women and 27 men, with ages between 20 and 65 years – is plotted graphically in Fig. 1.

Fig.1. Distribution of patients by gender
3. RESULTS AND DISCUSSION

As part of the therapy of psychic recovery for condylian repositioning, the drug treatment (with diazepam) was applied only to 6 patients, under a strict control of the psychiatrist, 32 patients being subjected to the prophylactic therapy conducted by a psychologist, 4 patients received a drug treatment with Xanax, while 21 had no need of psychic recovery (Fig. 2).

The treatment of articular pain is done for re-establishing the psychic confort of the patient, either as an emergency treatment, or as a stage of the complex treatment of condylian repositioning [4].

Most frequently employed were the acetylsalicylic acid and fasconal, as due to their antalgic, as well as anti-inflammatory effects.

Medication with anti-rheumatismal effect are applied in collaboration with the rheumatologist, namely infiltrations with corticosteroids (hydrocortisone, prednison, triamcynolon), positive results appearing within about one week. Both intra- and extra-articular infiltrations are efficient [5].

A single infiltrations with hydrocortisone, preceded by local anaesthesia, was made in one patient.

Systematization of the drug treatment with antalgic and anti-inflammatory drugs, in the group of patients under investigation, is illustrated in Fig. 4:

Fig. 4. Necessary of drug treatment against pain in the patients of the experimental group

Limits of intra-articular treatment application:
• Complicated administration techniques, hardly accepted by the patient;
• Treatment method depending on the psychic confort of the patient;
• Optional presence of inflammatory effects in the areas around the administration place.

The passive manipulation technique has immediate effects, if the episode is the first, acute and recent. The ligament and disk modifications generated by irreductible, previous meniscus dislocations will render more difficult the technique [6]. Application is recommended not immediately after diagnosis of the irreductible dislocation, the first operation to be attempted at being a meniscus reduction by the patient himself, yet under direct medical surveillance, through a simple technique.

Fig. 5. Reduction of meniscus dislocation by the patient
The data base provided results on the therapy of emergency muscular relaxation: only 22.2% of the patients (14) benefited from it, whichever the form of its application – Fig. 6.

As to the efficiency of the emergency therapy of muscular relaxation applied, it was observed that pain disappeared immediately after infiltrations in the trigger zones (7 patients), total remission was registered in the first 2 hours (3 cases) and partial remission – in the first 12 hours (4 patients), along with total remission within 48 hours in the persons having benefited from treataments with relaxation trays, or from mandibulary repositioning or manual manipulation.

The etiological and symptomatic curative treatment applied for muscular relaxation makes use of hypnotic sedatives, strong and mild tranquilizers, myorelaxing drugs with central action (mephenesine chlorzoxazone, methocarbamol, mydocalm), blockage of the neuro-muscular junction (derivatives of curare and succinylcoline, botulinic toxin), xyline infiltration of the spasmed muscles [7].

In the study group, the drug muscular therapy was necessary for recovery of the 19 patients, the main target of the administered drugs being not only myorelaxing effects but also their association with antalgic or anxyolitic effects.

Reduced secondary effects, associated with a most rapid myorelaxation, induced by Mydocalm administration, were observed.
Self-hypnosis, meditation and yoga appear as alternative relaxation techniques which may reduce the stress and the symptoms associated to muscular hyperactivity.

The therapy of muscular relaxation was applied to 40.85% of the patients in the study group, the isokinetic exercises and muscular stretchings proving their therapeutical efficiency, yet not as a single, short-time therapy, but only in association with other treatment techniques, requiring longer periods of time – Fig. 10.

Oral balneophysiotherapy is a stage that may be preceded or developed during the application of the methods of articular re-equilibration or even after centric repositioning, as a treatment for maintaining and preserving the newly obtained articular positions.

The therapy for attaining muscular relaxation through physical factors is indicated for prophylactic, therapeutical or recovery scopes. Utilization of physical agents in muscular reconditioning represents a practice applied since ancient times, even if the scientific explanation of its effects is more recent. The therapy may be associated with behavioral therapy, for reducing or even eliminating completely the vicious habits and the parafunctions of the stomatognate system [8].

Hydrotherapy and hydrothermotherapy, techniques known as utilizing the action of mineral waters and/or of local heat upon the articular region, depend on the physical and chemical properties of the physical agents. The hydrothermotherapy procedures involve application of compresses on the region, the therapeutical effects being determined by the vascular, muscular, nervous, local and distant reactions [9].

Indicated both during the treatment sessions and as part of the therapy applied at home, hydrothermotherapy appears as a highly efficient method, inducing either muscular relaxation or tonicity, as a function of the treatment temperature and therapeutical necessities. A simple method with visible efficiency, hydrothermotherapy has been one of the most frequently applied techniques, more precisely in 32 patients.

Peloidotherapy or the therapy with muds for external applications permits a passive diffusion either through the hairy follicule or through some channels, occurring at epiderm level, which penetrate the deep derm towards the articulation elements, thus inducing physical-chemical reactions that improve the local metabolism and regulate circulation at optimum levels. In this way, improvements are registered not only in the circulation at epiderm and derm level, but also at the level of the temporomandibulary joint [10].

Metabolically, increase of oxidases from the skin occurs at local level, and, in cases of arthrosis of the temporomandibulary joint, increases in the concentration of glutation-amine, as well. Applications of such muds as ointments, at the level of the temporomandibulary joints, reduced articular pressure and improved the activity.
Even if the efficiency of the therapy with muds is well-known, only 4 patients benefited from it, mostly because of the scarce knowledge on its efficiency in stomatology, but also for the discomfort created by the application of such a technique at the level of the stomatognate system.

For condylian repositioning, the massage may be either dry (utilization of talc powder for facilitating the movements), or wet (application of ointments on the tegumentary surface, with pharmacological myo-relaxing, analgesic, anti-inflammatory, vaso-dilatatory or purely mechanical action) [11].

Rhythmic movements, applied under moderate pressure or accompanied by vibrations in the pretragian region, the zone of condylian projection, induce analgesia and myorelaxation, the massage being well-tolerated and efficient. Reduction of painful sensitivity produces a decrease in the anxiety generated by both the organic dysfunction and the atmosphere of the stomatological office.

Massage techniques have been applied to 28 patients, their therapeutical efficiency being reduced, on short-term, in monotherapeutic applications, yet with considerable effects when associated with emergency drug therapies, and high efficiency on long-term, usually obtained by association of the massage with different thermotherapy techniques. The results of the massage therapy are noticed mainly after 3-4 weeks of complex therapy, in combination with other methods of condylian repositioning. Pain is reduced or partially eliminated, the efficiency registered within 3-5 days is good, no secondary effects occurred [12].

Phototherapy with infrared and UV rays may be obtained through transformation of electric energy into caloric energy.

UV or infrared phototherapy was applied to 9 patients, associated with other treatment techniques, never in monotherapy, their effects intensifying the action of other methods.

Electrotherapy was applied to 7 patients, the effect of increased local metabolic processes, analgesia of the painful zones and muscular relaxation having beneficial effects on both short- and long-term.

Pain melioration, efficient spasm reduction and a corresponding functionality of the articular elements were observed, sometimes for more than 3 days, the highest efficiency being registered on application of a continuous low-frequency current.

The electromagnetic bio-feed-back is another technique of relaxation and re-education of muscular activity, which employs surface electrodes situated at maseterin or frontal level, being connected to a monitor which will register muscular activity or the normotony level.

The relaxation technique through ultrasonotherapy, associated with the relaxation treatment with trays, was performed along 15-20 min sessions, at an interval of 24-48 hr, for a total of 15 sessions. The technique was repeated 1-2 weeks later, for acknowledging the obtained results. At the same time, any associated medication was eliminated, the technique having the advantage of its possible reiteration whenever necessary.

In the group of patients under investigation, the ultrasonic technique was applied to 12 patients. Association of etiological therapy with the treatment of muscular relaxation and application of ultrasonotherapy are highly efficient. It was observed that association of the etiological therapy with the treatment of muscular relaxation and ultrasonotherapy is really efficient,
pain being reduced for 3 days, while no secondary effect was observed.

Applied in the treatment of articular diseases are also laser sources of low emission energy. The biological effects of laser light are stimulation of cell growth at the level of the conjunctive, bony or ligamentary tissue, anti-inflammatory action, and biostimulation of collagen production in ligamentary breaches [13].

The laser was used 4 times a week with 4 J/cm² on the temporo-mandibulary joint, for a maximum number of 10 applications.

Fig. 14. Laser therapy for ATM and musculature

After 3 laser applications, pain disappeared in 5 patients, along with a substantial melioration of painful perception in 4 subjects. Pain is suppressed, the duration of efficiency exceeding, in some cases, 5 days. No secondary effects.

Kinetotherapy, namely the therapy involving movements at the level of articulations, aims mainly at inducing relaxation, increased articular mobility, higher muscular force and muscular resistance, coordination, control and equilibrium, capacity of prolonged efforts.

For attaining an amplitude of condylar movement within normal limits, a series of exercises of muscular stretching are recommended:

- dynamic muscular stretching involves slow voluntary movements of the mandible, a slight exceeding of the maximum point of the possible movement amplitude being attempted at.
- isometric muscular stretching is a combination of passive stretching with isometric contraction in the position of passive stretching realized by the physician.

To conclude with, the techniques of condylial repositioning through physical factors or movements were applied to 40 patients, for 8 of them as a monotherapy while, for 32 of them, the techniques of articular reconditioning through movement or muscular relaxation were associated with drug or occlusal interception methods, as stages of the complex treatment of condylial repositioning.

Fig. 15. Balneo-physiotherapy treatment applied to the patients of the study group

Occlusal interception and tray application

Another stage of the treatment of condylial repositioning is occlusal interception, realized with several types of occlusal trays which, as a function of the type and time necessary for their application, may be classified as:

- emergency occlusal trays
- relaxation occlusal trays
- occlusal trays of mandibulary repositioning
- stabilization occlusal trays

Fig. 16. Relaxation trays

The trays were applied to 25 persons, in 16 of them as a monotherapy, the patients refusing any drug therapy, which explains the belated manifestation of the effects expected by the patient, while other 9 patients associated occlusal
interception with balneophysiotherapy methods, as well as with a drug therapy for muscular and antalgic relaxation.

Trays were not necessary in all subjects, their precise selection and establishment of pathology being decided by the stomatologist.

Subjective efficiency, as well as the one established during periodical controls, is higher in the patients who associated the tray treatment with other drug or balneophysiotherapeutical methods, the effects being possibly observed at least two weeks after their application [8].

**Treatment of occlusion re-equilibration**

The treatment of condylian repositioning requires a special therapy – both as to its application and results expected - namely *occlusal re-equilibration*.

Such a treatment may be performed by several methods, as a function of the cause having produced the articular modifications, such as: selective polishings, crown amputations, dental extractions, remodelling of the prosthetic occlusal relief, removal of useless gnatoprosthetic devices, surgical orthodontic treatment.

The objectives of these techniques are identical, namely: realization of a centric occlusion with correct marks, optimum anterior guidance, melioration of the articular symptoms associated to occlusal problems, attaining and maintaining a static and dynamic occlusal stability capable of assuring a correct functionality at articular level.

Necessary for meeting these requirements is a correct selection of the treatment variant, involving a minimum invasive approaching of the stomatognate system, so that the end of the treatment should assure melioration of all disfunctional manifestations [3, 7].

Occlusal stability is the key element for the recovery or maintenance of a centered position of the mandibulary condyles at the level of the glenoid cavities, whereas the above-mentioned methods are expected to induce or maintain this position.

Occlusal therapy was applied after a most precise establishment of the indications of occlusal re-equilibration for each case in part, individualization of methods, exclusively in the presence of the clinical and paraclinical signs of traumatic occlusion.

The Iaşi school of gnatology, represented by Prof. dr. V. Burlui, proposes a somehow more complex – as to its steps - and more rigorous method, yet with fewer possible failures, based on the concepts of natural occlusion.

![Fig. 18. Necessity of crownplastia](image)

In the case of periodontally affected teeth, occlusal re-equilibration will be done only after the application of all stages of periodontal treatment, even immobilization – if necessary.

Realization of the occlusal relief at the level of the gnato-prosthetic devices is a desideratum of prosthetic rehabilitations, on whose observance depends the functionality of the therapeutical occlusion while, if the above-mentioned scope is disregarded, remodelling or even removal of the respective prosthetic substitute becomes compulsory.

In the stage of cranio-mandibulary repositioning, one may resort, up to the realization of gnato-prosthetic apparata for long-term utilization, to the consolidation of the cranio-mandibulary position, to temporary prostheses by means of Scutan-type masks or to mobile acrylic prostheses – as illustrated in Fig. 19.

![Fig. 19. Cranio-mandibulary repositioning with reconstruction of the correct occlusal ratios by mixed acrylic prosthesisizing (Scutan mask and acrylic prosthesis)](image)
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Fig. 20. Uneven occlusal relief and prothesizing with mandibulo-cranial repositioning

Observance of the morphology of gnato-prosthetic devices, reconstruction of the elements of static occlusion which determine dynamic occlusion will permit the realization of occlusal relations capable of reducing the overstress of the articular elements, according to the known gnatoprosthetic principles (Fig. 21).

Fig. 21. Cranio-mandibulary repositioning by reconstruction of the correct occlusal relief

In the group of patients under investigation, 23 persons benefited from measures of occlusal re-equilibration, which demonstrates, once again, the inter-relations between the elements of the stomatognate system, any occlusal modification being perceived and transmitted to the articular elements. The effects of the methods of occlusal rehabilitation did appear only two weeks after the installation of the new conditions of interarch contact [13].

Three subjects refused the application of the techniques of occlusal re-equilibration through orthodontic treatment, which explains the maintenance of the disfunction conditions at occlusal level and, implicitly, perpetuation of their effects at articular level.

Cranio-mandibulary repositioning

Cranio-mandibulary repositioning is a stage superposed, as to its application techniques, to the already described ones, involving complex methods of pain therapy and muscular relaxation, therapies of occlusal re-equilibration and physiotherapy, the whole set of measures aiming at assuring a normal functionality of the mandibulo-cranial relations.

The last, yet not the least important, stage in the didactic gradual development of the treatment of condylian repositioning is the maintenance treatment, appearing as a combination of techniques and measures aimed at consolidating and perpetuating, in time, the obtained results. Including either simple balneophysiotherapeutical techniques or complex methods of cranio-mandibulary repositioning, the maintenance and stabilization treatment is as important as the previous steps taken for preventing any possible reccurrence, while controlling, on long term, mandibulary dynamics, occlusal stability and position of the mandibulary condyles in the glenoid cavities.
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4. CONCLUSIONS

Considering the multiple possibilities through which the therapy of condylian repositioning may be applied, it goes without saying that it intervenes in all phases of the treatment of complex rehabilitation of the stomatognate system.

The efficiency of the treatment schemes for rehabilitation of the condylian position has been demonstrated in time by the low ratio of recurrence of the signs and symptoms of the cranio-mandibulary malrelations with articular and occlusal preponderence.

References