MEDICAL REASONING IN DENTAL PRACTICE

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Abstract

The medical reasoning proposed in general dental practice is the process by which the medical team is guided by the statistical consequences of consultative relations between previous cases with experiences of an objective nature having successes or promoted successes. Medical reasoning through the systematic elaboration of the clinical and paraclinical algorithm aims to assist the medical staff involved in the treatment of patients to make decisions in their care with dental conditions of any pathological nature/. It must present recommendations of good clinical medical practice based on published evidence ,argued to be taken into account by doctors from dental medicine and other related specialties, as well as by auxiliary medical staff (dental technicians, biological analysts and nurses) involved in the care of patients with dental conditions. Although common sense is a substantion of good medical practice based on the latest available authenticated evidence, it is not intended to replace the practitioner's judgment in each individual case.

Keywords: *deductive reasoning, dental practice, theoretical documentation, practical observation*

Introduction

Medicine is one of the most challenging medical professions because we work and make decisions at a microscopic level, that's why we don't treat people with robots, we work with robots for people(1).

Medical decision making is an integrative process that must take into account the individual circumstances and choice of patients, as well as financial resources (in the current context of capitalization) in particular, the specific and non-specific characters as well as the limitations of medical practice offices.(2) Good medical practice consists in the fact that each practitioner who applies the suggestive recommendations of the integrative environment in the specialized field, in order to diagnose, define a therapeutic or follow-up plan or perform a particular clinical procedure and finally use their own independent medical reasoning in the context individual clinical circumstances, to decide any care or treatment of patients according to their particularities, diagnostic and curative options available(3).

A holistic view on diagnosis and treatment provides the key to applying the prophylactic and curative concept by recording all systemic component elements and all specific systems including the individual in the bio-psycho-social context(4).

Both the diagnosis stage and the treatment stage require a decision-making and deductive process structured on rational stages that impose responsibility on the part of the attending physician in the preparation and application of the treatment plan(5).

The diagnosis includes data about the general condition, loco-regional and local evaluation, while the therapeutic hierarchy aims at the phasing of the long-term treatment plan and the complex series of decision-making moments and precedes the development of the diagnosis as a stage. The general therapeutic scheme includes the following stages: health education, general training, local training(6).

The starting point of the diagnosis is reasoning, based on good documentation, and the element of clinical observation is the one that confirms the diagnosis. So we find ourselves here in front of the same elements that are the basis of clinical sense: theoretical documentation, practical observation and reasoning. Diagnosis is based on this tripod, which is the most important factor in medical practice(7).

2. Material and method

Objective and subjective clinical reasoning are not intended as directives for a single course of diagnosis, management, treatment or follow-up of a case or as a definitive way of caring for patients, but rather involve hypothetically deductive, deductive, inductive, transdeductive, logical, abstract, specialized in the specific field as variations of the medical practice that can be functional and useful based on the individual circumstances, the patients' choice, as well as the resources and limitations specific to the dental field or the type of dental medical practice (oral-maxillofacial surgery, orthognathia, orthodontics, children's dentistry , endodontics, prosthetics, etc.(8). Where the recommendations of these guidelines of good medical practice under the umbrella of medical judgments classified specific to the areas of activity are modified, significant deviations must be documented in protocols and medical documents, and the reasons for the changes must be justified in detail.

Offices, medical clinics together with related institutions that depend directly or indirectly through the involvement of patients have legal responsibility for any inaccuracy, perceived erroneous information, for the clinical effectiveness or success of any detailed therapeutic regimen, for the manner of use or application or for the final decisions of medical personnel resulting from their use or application. They must also take responsibility for the information regarding the pharmaceutical products mentioned and prescribed. Therefore, in each specific case, physicians and patients should be directed to check the specific literature through independent sources and confirm that the information contained in the recommendations is correct(9).

The way people perceive the probabilities of medical reasoning by simply asking WHY?, must determine a convincingly reasoned plausible answer to be approved but is not perfectly correct, as there is no innate ability to initiate intuitiveness. As with logic, people need some linguistic training in reasoning to understand all the subtleties of probabilistic reasoning. In the following, we will present some paradoxes, situations that lead to non-intuitive conclusions, but which prove to be correct after a deeper analysis(10).

Access to information denotes transparency and trust in the medical act, but more importantly, the patient certifies the human index in accordance with the operational index of the high-performance technology that is the basis of the active dental care procedure.

Consider a doctor who proposes a new prosthetic treatment as a concept and wants to compare it with a standard prosthetic treatment in terms of the time required for implementation(11) .

The lot of patients of our study was consisted of 190 patients . Distributions of the group of subjects according to sex, age, origin place, study, the type of treatment

applied and the rate of accommodation are available in the pictures 1,2,3,4,5, 6, 7.

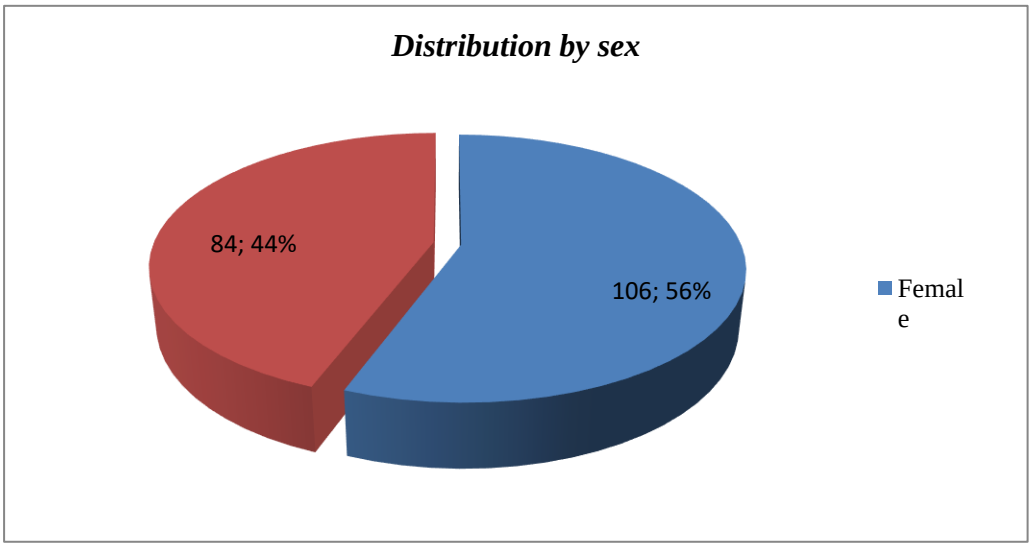
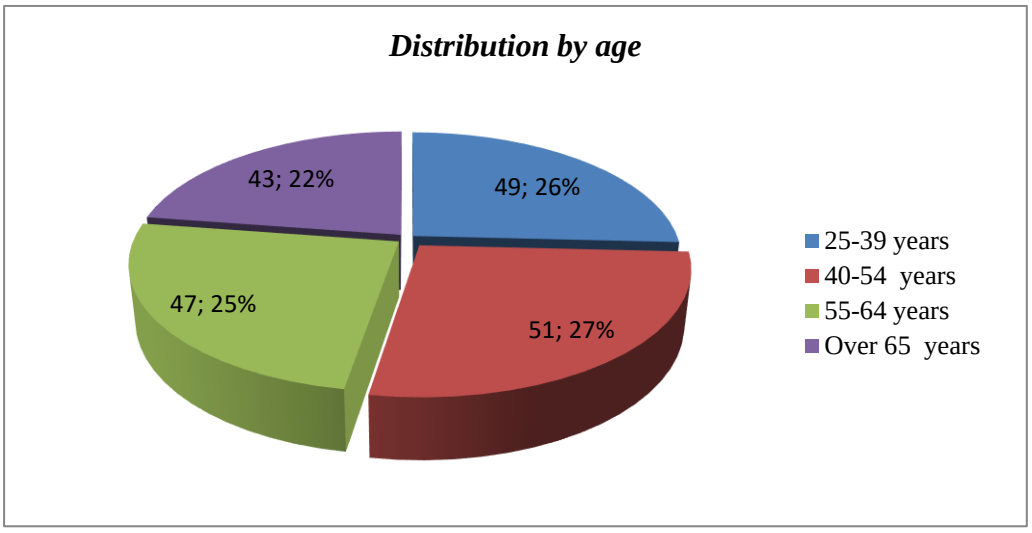


Fig.1



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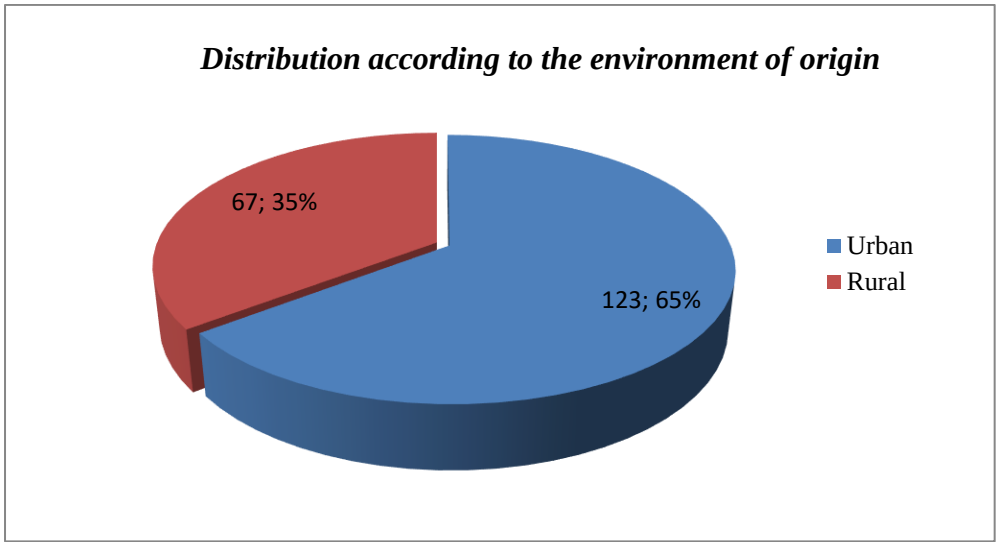


Fig.3

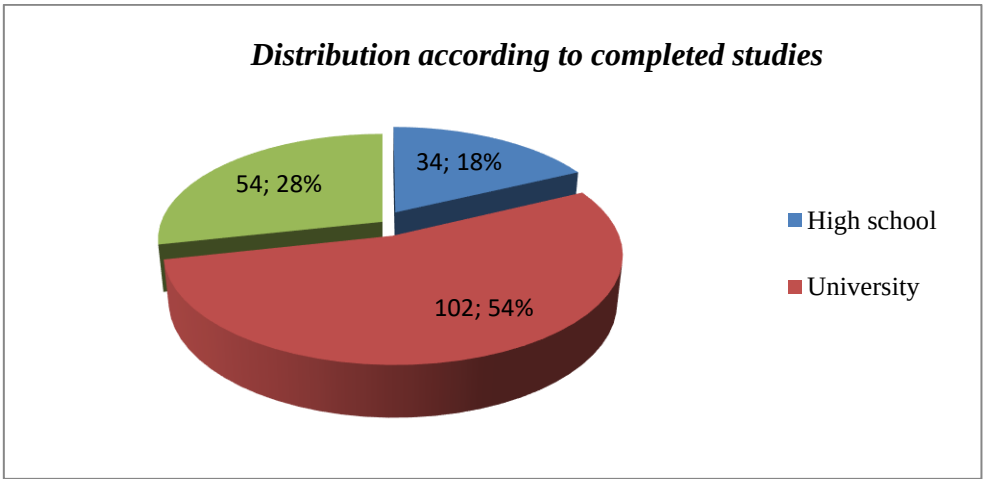
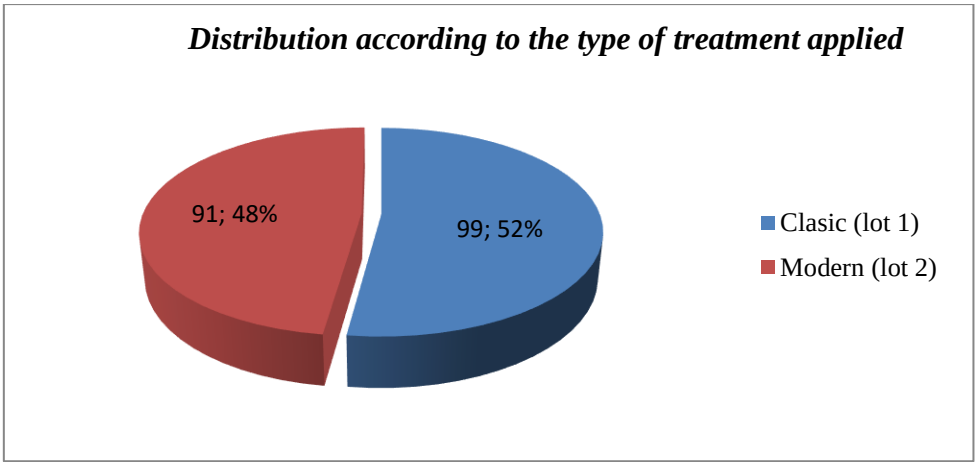


Fig.4



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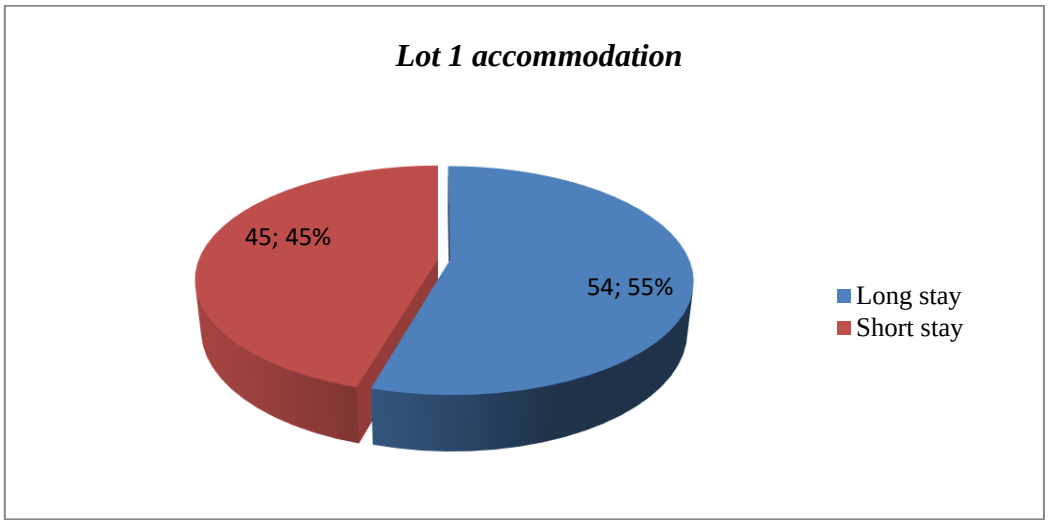

Fig.6

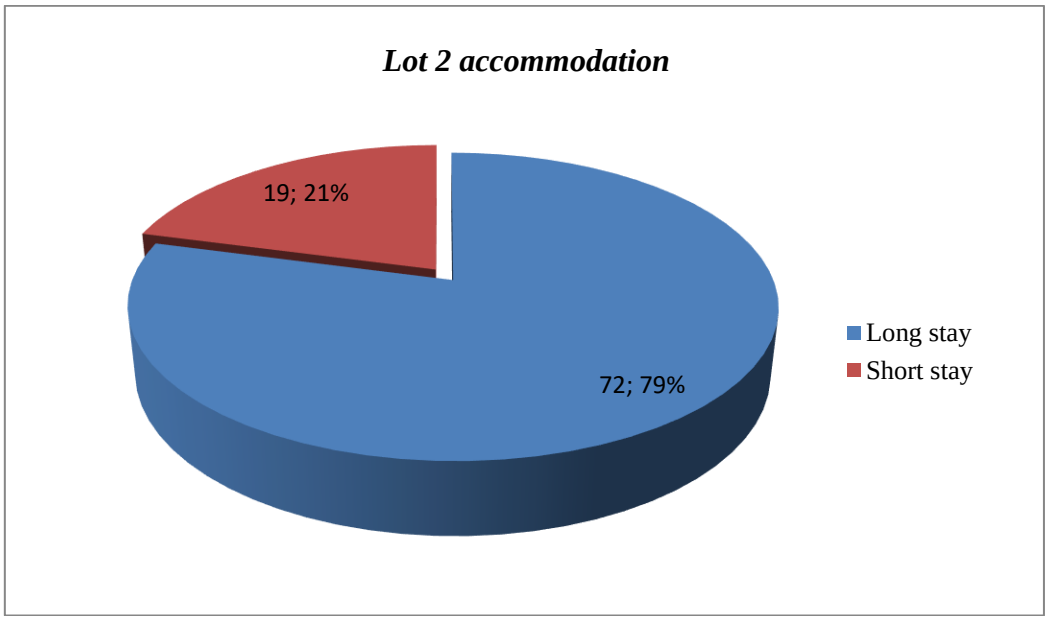

Fig.7

From these data we can draw the conclusion, the new prosthetic treatment seems inferior to the standard treatment given that 79% of the patients undergoing the new treatment had a longtime of accommodation, compared to 55% of the patients standard treatment. Also, only 21% of the patients undergoing the new treatment had a short time of accommodation, acceptance, compared to 45% of the patients who received the standard treatment.

3. Results and discussions

Beyond the practical applications of the classification techniques to be presented, they are of great importance because they give an image of the way the dentist thinks

in relation to the patient and the appropriate resources for the clinical environment, respectively paraclinical or medical laboratory for biological analysis or dental technique(12,13). When we apply analogies to situations encountered or aspects seen before, it is sometimes difficult to explain exactly why. In order to extract explicit rules from the model based on analogy, we can conclude tha tth erules are theoretically verbalizable to the patient, but are generally more concise to be understood and retained through visibility (radio imaging, DSD system, CAD/CAM)(14, 15). Similarity ranking can take into account, by default, a large rnumber of aspects. There is also the probabilistic approach since the effectiveness of a clinical case can determine important atypical protocol factors as roots of elaboration and exploration for future cases where they can be applied.

In the two case studies presented below, we followed the coloristic correlation of verbal and logical reasonings, describing technique sand methods for obtaining an esthetic integration and the optimal emergence profile of dental restorations and implants. Using a computer-aided design software program, information data capturedwith an intraoral scanner was used to establish anatomically marks to determine the maximum buccal volume towhich a restorationcanbeextended.

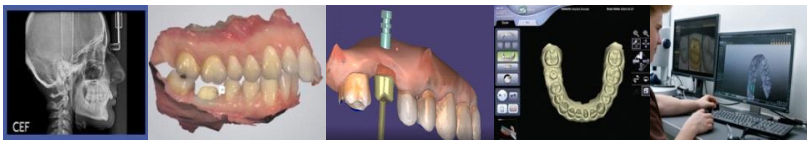

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Fig.8 Computer-aided design software program, informational data captured with an intraoral scanner then transferred to the laboratory in theform of STLS: a) profile view; b)occlusion registration; c) dimensional establishment of the implant for 1.6; d)assembly view of the lower arch; e) data preparation in the CAD software data informationsystem.

This technique could be applicable to different types of treatments with fixed and removable dental prostheses, surgical guides, osteoperiostealprostheses, orthodontics as well as 3D model printing. The advantages of this technique include establishing periodonto-prosthetic criteria as a clinical data bank as well as improving clinical and laboratory communication(17,18). Evaluation of restorative space from the oro-maxillo-facial profile with the help of computer-assisted programs, of dento-dental units are used to avoid restorations overestimated in size, shape and color(19,20).

- **Clinical case I**

In the current context, the patient is invited to discover by himself through reasonable reasoning the stages of treatmentby building a pre-visualization of the entire prosthetic treatment process to which he will be subjected through acceptance and awareness(21, 22). The evaluation of each individual case is very important for a successful long-term treatment, the periodontal and endodontic prosthetic prognosis will define the approach to the clinical situation. Heuristic thinking regarding the odontoperiodontal unit 4.6, the tooth exceeds the plane of occlusion together with the alveolar bone due to antagonistic teeth and requires surgical correctionwith restoration of the new minimal biological space. The surgical correction decision will take into account the new crown-to-root ratio obtained, but also the obtaining of the 3D effect ferrule. Thus prosthetics can be favorable. The endodontic prognosis is favorable since it is a treatment of an endodontic system without

structural changes. Explicitly, we can describe the following: a dike isolation will be done, cleaning and reconfiguration consists of mechanical and rotary instrumentation using the regular endophyte system in FRM movement 120 degrees up to 150 degrees 25/#0.6M and 30/#0.6D. The canal is cleaned with a 5.25% sodium hypochlorite solution, fresh, alternatively 17% EDTA solution will be applied. Conjugate for apical area negative apical breser and DMA technique with gutta-percha master cone. 3D obturation using the hydraulic technique then sealing the entrance to the canal swith flow build up composite reinforced with a glassfiber pivot, followed by preparation with a threshold for an indirect crown in the hybrid ceramic cabinet for drive test functional adhesive cemented then post operative x-ray.

Fig.9 Panoramic assembly imaging

In this case presented, 4.6, modern conservative dental treatment prefers minimally invasive options to the relatively destructive treatments used in the age of amalgam and noble, seminoble or non-noble alloys. The use of all-ceramic restorations such as zirconia core or platinum foil overlays are still viable treatment options on large dentin structures such as prepared cavities on teeth with odonto-coronary lesions. Also, we cannot fail to mention, as an elective reasoning, the possibility of restorations with hybrid composites (explicitly 2.1). Minimally invasive treatments have become possible in restorative and prosthetic dentistry through the development of adhesion techniques to the enamel matrix and dentin through the improvement of restorative materials, especially resin composites. However, inadequate rheology and mechanical properties, particularly flexural strength, fatigue strength and toughness of resin composites of particulate fillers, have limited their use in heavy-loading areas in single restorations and especially in fixed prostheses .We have to anticipate the success of the endodontic treatment at 4.6 to be able to accept the before mentioned absolute reasoning regarding this by full endodontic restoration with reinforcement on glass pivot sand ceramic or composite or metal or zirconia inlays. The impact of the final decisions debat able because the prosthetic treatment options must exclude the damage in a certain way of the active participant antagonistic teeth through static or dynamic occlusion of trituration of hard or soft food(21,22). The endodontic treatment at 1.6 through rational eccentricityis a failure, therefore the exclusion of canal treatment and its replacement with extraction favors the application of a spacemaintainer or the creation of a suitable space for the eruption of the 18-year-old molars. Logical and deductive reasoning participates in the

exclusion of a postoperative implant but not worth neglecting(23,24).

- **Clinical case II**

In this case study, 40-year-old patient, without associated diseases, smoker, drinker of acidic drinks, fast food and lack of hygiene as well as prevention, as can be seen from the complementary investigations that consisted of a panoramic radiograph and a bimaxillary radiological balance with a history of reflux gastro-esophageal.
The patient presented toour clinic complaining of a fetid smell and unpleasant taste accompanied by foul-smelling breath, mobility, during the intraoral examination of some rootremnants presented generalized gingival bleeding. In the past, he had undergone dental treatments and, due to lack of time, completely neglected dental services. Following multidisciplinary specialist consultations, the case was analyzed from a holistic point of view using diagnostic reasoning according to the clinical and prognostic picture retained. .

The clinical examination and paraclinica investigations demonstrated the lack of hard substance and soft substance to the detriment of the patient, taking into account possible bone grafts or augmentations before the sequential application of implants to support any fixed prosthetic works combined with removable prosthetic works(25,26).

Fig. 10 Orthopantomography, general view

Reasonable professional judgment means an objective conclusion based on knowledge supported by specialized literature and current practice in years, skills, abilities, qualifications, appropriate professional competences, after expert consultation, analysis and careful consideration of the subject matter and to all relevant epistemology documents. Therefore, it is suggested to obtain several professional opinions before starting extensive prosthetic therapy(27,28).

The complex prosthetic procedures applied in this clinical case are often necessary due to the significant loss of teeth, bone and soft tissues. Treatment plans vary widely. The perceived need for prosthetic therapy also varies significantly, as does the expertise of dentists, experienced dental technicians, and the laboratories that support these practitioners. As an alternative treatment we can mention a hypothetical deductive reasoning for this case the primary logic of a generalist convinced of success with the desire for success(29,30).

Endodontic therapy in this case requires analysis, patience, precision and experience. Outstanding root remnants with a probability of therapeutic success involve treatment of several sessions on 1.1, 2.1 with gingivectomy then endodontic relevance, but a question mark remains, 2.2

respectively 2.3 with calcium hydroxide paste, iodoformate paste, MTA, and retreatment 2.2, 2.3, 2.5, 2.7. Regarding the lower arch we can anticipate 4.4 and 4.6 or 4.7, we don't know if it migrated to the 4.6 space but the presumption exists. In the third quadrant, endodontic treatment will be attempted with a 40% to 50% chance of success for 3.1, 3.2, aiming for 3.3, 3.4, 3.5 to insist on preservation as much as possible, taking into account the conservative stability of the hard tissue and compatibility with the neighborhood . Radiological evaluation in the second quadrant, reveals the presence of bone retraction even loss of substance. After the mechanical removal of the detritus from all root remnants candidates for prosthetics, an individual evaluation is done periodically during the treatment. In case of failure of endodontic treatment, the extraction of the periodontal unit is resorted to, and in case of false teeth, they are protected with GeriStoreDentmat. Mechanical manual rotary endodontic retreatment is performed on the root remnants with older fillings by removing the gutta-percha from the canals by moving CCW 350rot/min, 0.4Ncm and re-instrumenting the canals up to 25/0.6 by incomplete reciprocal rotary movement FRM120*-50* and negotiating of previously missed channel MV2 by full 20*-30* reciprocating motion followed by cleaning, reconfiguration and obturation. PUI with hypochlorite 5.25%, EDTA 17%, hydraulic obturation, reinforcement with glass fiber pivot plus build-up or dentatus plus build-up or resort to one-time canal impression followed by fingerprint scanning. If one opts for a coronal root device made of hybrid or zirconia resins.

Prosthetic therapy usually has a predictable expected longevity directly proportional to the quality and type of prostheses (fixed or removable), the complexity of the patient's need (actual active biological resources present) and subsequent oral hygiene. The expected longevity of the proposed prosthetic work determined by intrinsic and extrinsic factors, should be discussed with the dentist to determine the potential cost-effectiveness of the proposed therapy(31).

The non sine-qua-non fact must be mentioned and taken into account, the prosthetic treatment in this case is not a single treatment during the exercise of the treatment plan, nor the only one during the patient's life. Consequently is the continuation of several different types of restorative and prosthetic dental treatments. Through obstructive and prudent medical reasoning, the cyclic therapy of restoration with the highlighting of the healing process due to the existing biological indices and values as a reserve of bone and tissue capital from the biological bank of the individual, involves procedural standards and classic methods of work according to the holistic presentation of pre-prosthetic treatment , prosthetic and post-prosthetic. The dynamic approach to the proposed treatment begins with the preservation of the remaining odontoperiodontal units and the application of intuitive-abstract reasoning as a result of the process of scaling the decay of the remaining teeth. Thus, it offers the patient a substantial credit from the own soft and hard tissue system related to the biological base as a definitive restoration to replace the missing teeth by replacing them or actual implantation taking into account the bone supply. Acceptable, biologically active biomaterials such as flexible prostheses, high aesthetic performance resin systems (when prefabricated resin veneers or prototype ceramic veneers are applied as a superstructure on infrastructure systems such as Bioloren, Peek, Biohpp), zirconia core type: Zirconium Monolit, Zirconium Multilayer are suitable for the dynamic treatment approach due to their high mechanical strength and versatile clinical indications.

4. Conclusions

In decisional medical reasoning, physicians should not recommend diagnostic or therapeutic decisions that require analysis beyond the application of rules in a strict protocol. An incomplete diagnostic picture is a confusion that tries to shed an ominous light on uncertainty. Reasonable medical certainty means beyond a reasonable doubt, convincing evidence. In dentistry, we state that there is a possibility that the patient has some possibility of reconfiguring or restoring the functions of the stomatognathic system, but the possibility in these circumstances may indicate an important or significant relationship or probability, or an unimportant or insufficient probability. In these circumstances, the word probability may have a meaning for the attending physician as close as possible to medical certainty.

Many medical decisions are made within reasonable limits and medical certainty coexists when there is resolvable reasonable doubt. In medicine, concerns such as risk, iatrogenics, harm, future damage from misapplied trade-offs, etc., are some of the factors considered part of such a sound decision as risk or trans-deductive medical reasoning. In standards used in the medical field as a protocol or guideline for prosthetics, surgery, etc., the ultimate goal of diagnosis and treatment is not the same as standards used as law for purposes of clinical evidence. While medically the word probable may mean medical certainty in certain clinical but not laboratory contexts, it may be a 51 percent probability that it is declared evidence for a universally valid law.

Cumulatively in conclusion, it is clear that reasonable medical certainty does not mean clear or positive certainty. It should express opinions with as clear a degree of certainty as possible, with supporting evidence, and not be confused with a scientific concept of certainty. The definition consists in expressing that reasonable medical certainty is that degree of imaging certainty as a reserved prognosis but not certified only clinically and biologically on which a doctor relies when making a diagnosis and starting treatment.

"*Medical necessity as a medical act can be a certainty"*, when a health service is performed on which a doctor, regardless of specialty, elaborates a prudent clinical logical reasoning, provided to a patient. The medical service must be complete, not fractional: for the purpose of evaluating specific clinical cases, diagnosis and investigations (clinical, paraclinical) or treating a condition with recurrent pathology, symptomatology (from cause and effect, diagnosis and treatment), complementary diseases of these symptoms in accordance with generally accepted standards of medical practice.

Heuristic medical thinking is focused on diagnosis and differential diagnosis (medical reasoning process), which is a challenging, operational concept of medical thinking as a form of critical and analytical thinking. In particular, "medical reasoning is deductive, deductive, abstract, intuitive, trans-deductive, logistic, linguistic reasoning that aims to give logical form to the treatment, coherence in finding the optimal solution that will end the patient's "suffering", converting the data of clinical semiology (symptoms) in elements from which medical knowledge is built, a diagnostic formulation that represents the result of an epistemological approach finally converted into a therapeutic treatment plan.

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