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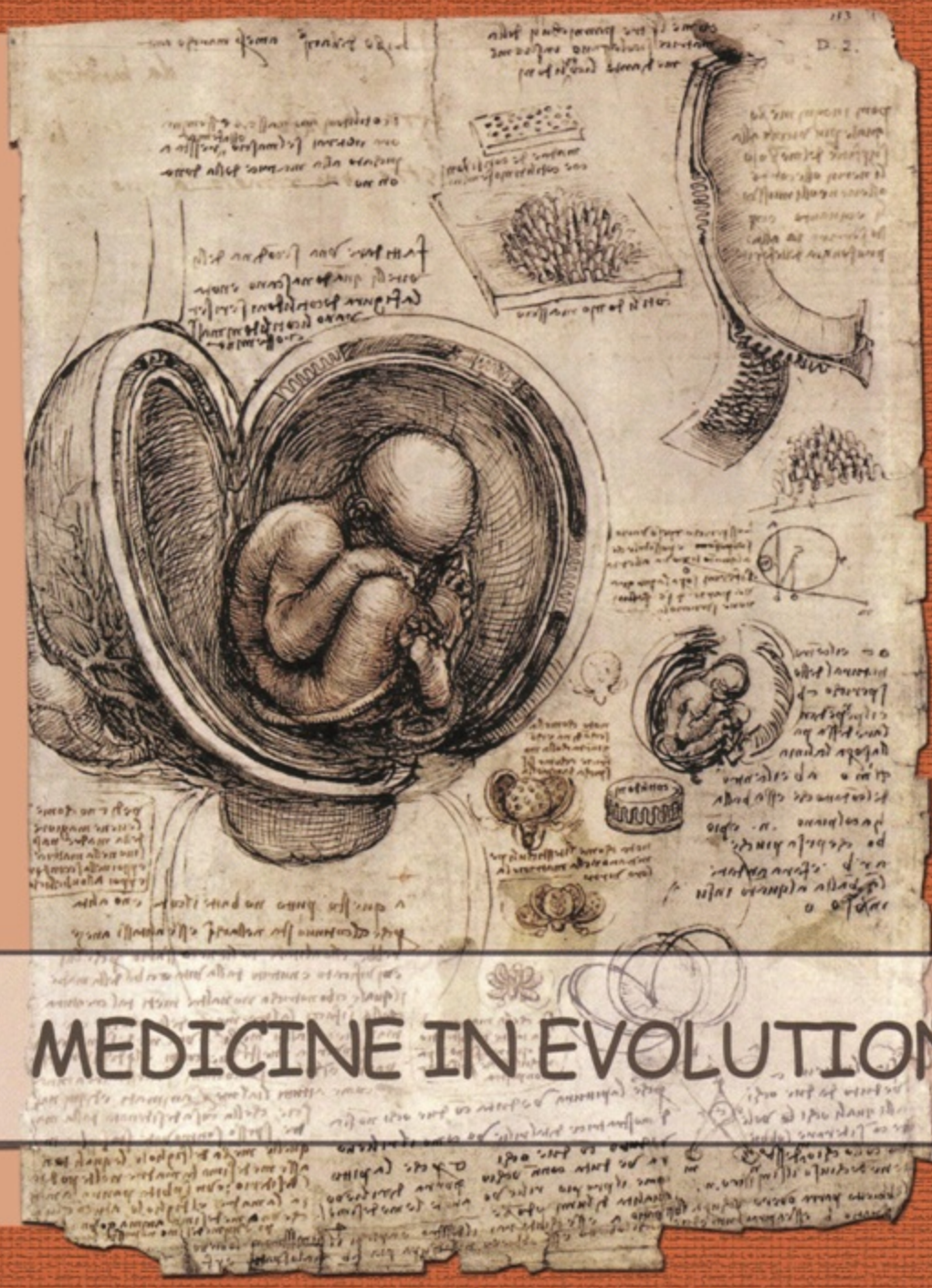

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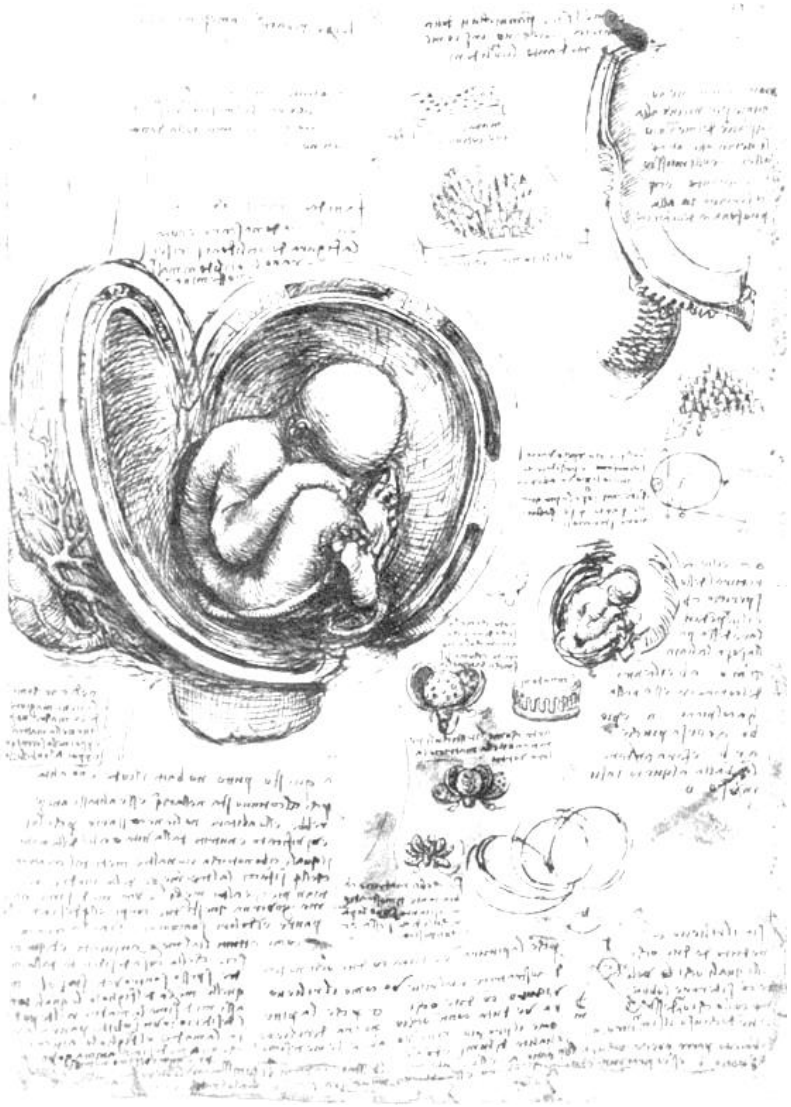

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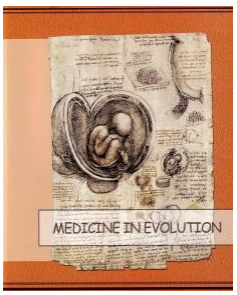

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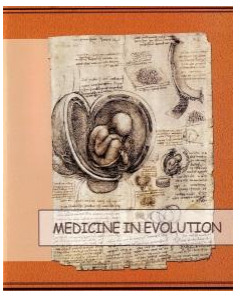
The impact of lifestyle in diabetic patients



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Abstract

Type-2 diabetes remains highly prevalent with an increasing incidence globally. In addition, the number of diabetes patients is expected to increase from 285 million to 439 million by 2030. [1]. Considering the fact that a sedentary lifestyle is considered to be a modifiable risk factor for type-2 diabetes and an independent predictor of poor quality of life, the main objective of this study is to assess the effects of a vegetarian diet (supported by the American Diabetes Association and the American Dietetic Association) combined with physical exercise on the quality of life of people with type-2 diabetes.

Keywords: lifestyle, vegetarian diet, type-2 diabetes, quality of life.

INTRODUCTION

Type-2 diabetes has become one of the main causes of morbidity and mortality in many countries. In addition, the number of patients with diabetes is expected to increase from 285 million to 439 million by 2030. [1]. Diabetic patients tend to have a poor quality of life. A sedentary lifestyle is considered to be a modifiable risk factor for type-2 diabetes and an independent predictor of poor quality of life. Exercise is a key treatment for people with diabetes. The purpose of this study is to conduct a systematic study to assess the effects of a vegetarian diet associated with physical exercise on the quality of life of people with type 2 diabetes.

MATERIAL AND METHODS

It was an observational, retrospective study of 60 patients with diabetes mellitus who presented to Herghelia Lifestyle Health Centre for 10 days between January 2015 and January 2017.

For ten days, all patients served a strictly vegetarian, nutritionally balanced diet in accordance with the provisions of the American Dietetic Association and the American Diabetes Association, without saturated fat or saturated fatty acids trans, without cholesterol, but rich in vegetables, salads, fruits consumed daily, nuts, seeds and whole grains.

The meals were served 3 times a day at fixed times. The patients were encouraged to drink water between meals, therefore they had consumed at least 6 glasses of water by the end of the day.

For the patients with high glycemic values and high grade of obesity, it was recommended to replace dinner with tea or fruit, and to lower or even to drop the insulin dose, it was recommended to walk 6-12 km a day. Also, in the evening, they were advised to go to sleep at 9:00 p.m.

Additionally, the lifestyle intervention also included 4-5 weekly aerobic training sessions (with a duration of 30-60 minutes) out of which 2 to 3 sessions were combined with resistance training.

After the therapy, we compared the outcome of the analyses from the beginning to those at the end to show the impact that lifestyle change had had in just 10 days.

After inserting and processing the data in the Microsoft Office Excel program, we divided the data into three parts, as follows:

1) General characteristics of the patients — we analysed the group by gender, genetic factors, anti-diabetic medication administered, mean glucose values in relation to the dose of treatment administered, other associated pathologies.
2) "The negative impact of lifestyle"-we analysed the risk factors that led to the appearance of type 2 diabetes and maintained it, including stress, low hours of sleep, hyper-caloric diet, not respecting the proportion of carbohydrates, lipids, proteins, the correlation between the waist/hip index and the increased insulin resistance.
3) "The positive impact of modified lifestyle in diabetic patients": we compared the analyses of the day of arrival with those on the day of departure to see what changes can bring an ideal lifestyle into the glycemic values.

RESULTS AND DISCUTIONS

A total of 60 patients were included in the study-32 patients were females and 28 were males. In the present group, there is a remarkable increase in the frequency of diabetes after the age of 50, with a maximum of 22 cases in the age group 60-69 years, with predominance

among females. The increased frequency in this age group is supported by the decrease in energy metabolism with aging, increased sedentary and associated cardiovascular disease [2].

21 patients have a history of diabetes in their families; 15 of them have only one parent with diabetes and 6 have both parents with diabetes. We noticed that in patients who have both parents with diabetes, the disease appears earlier compared with those who have one parent with diabetes history or none. Interestingly, the patients without a genetic substrate of diabetes have the similar average age of the onset of disease as those patients who have a single parent with a history of diabetes. This result is explained by the fact that the unhealthy lifestyle of the patients has a greater impact on the body than the heredity itself. [3]

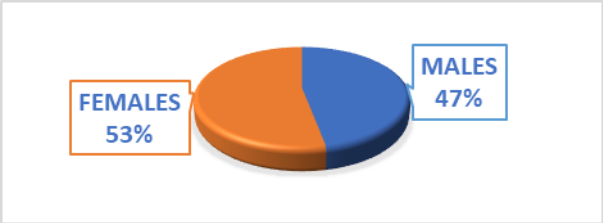

Figure 1. Graphical representation of patients based on gender

AGE GROUP (years)	NUMBER OF CASES	M	F
30-39	1	1	0
40-49	7	4	3
50-59	17	9	8
60-69	22	10	12
≥70	13	4	9
TOTAL	60	28	32

Figure 2. Graphical representation based on age group

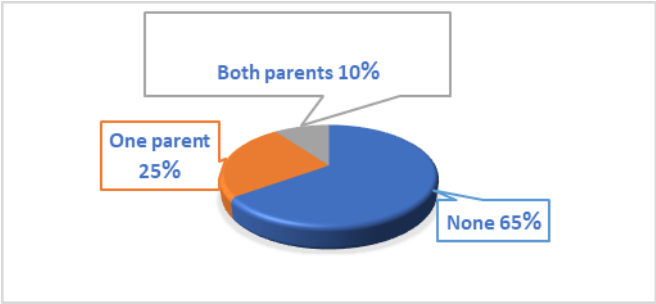

Figure 3. Percentage representation of the presence or absence of genetic factor in diabetes patient

Table 2. The presence of heredo-colateral history of diabetes and the age of onset

AHC DZ	No. of cases		No. of cases	Average age of onset of DZ	The earliest age of onset of DZ
YES	21	One parent	15	52 years old	38 years old
		Both parents	6	44 years old	28 years old
NO	39	None	39	50 years old	35 years old

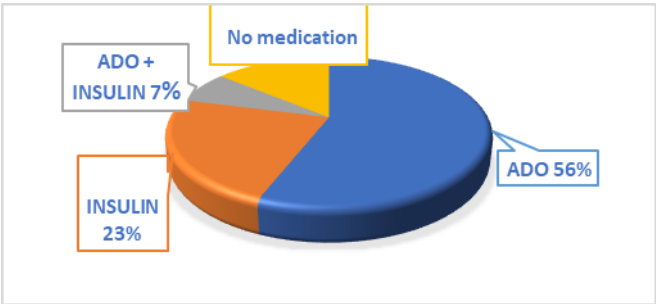

Figure 4. Distribution of cases according to the medication administered

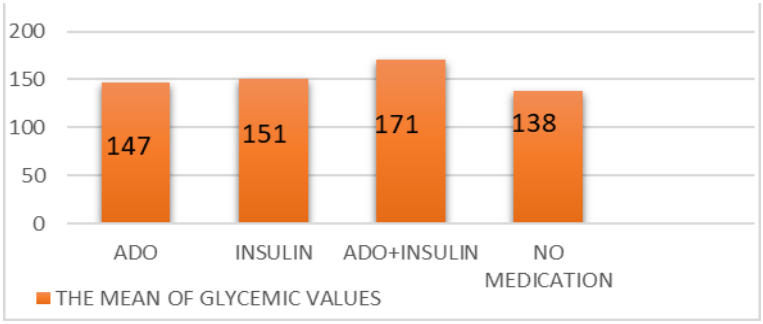

Figure 5. The mean of glycemic values in relation to the medication administered

According to chart 5, despite the medication, the glycemic values of diabetes patients are still high. We tried to find out the factors that could influence the glycemic values and to find a solution for these causes.

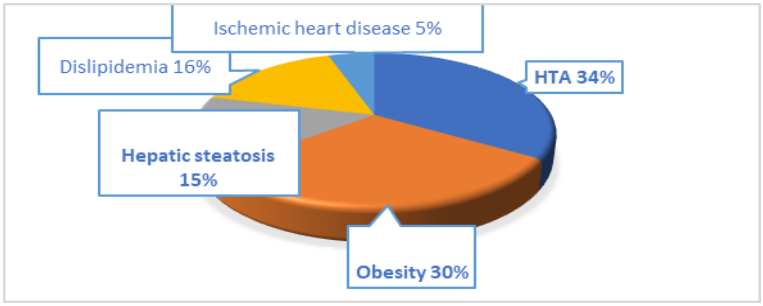

Figure 6. Distribution of cases according to associated pathologies

Cardiovascular diseases explain the mortality of ~ 75% of patients with diabetes. [4]

The negative impact of lifestyle

Under pathological conditions such as systemic atherosclerosis and type 2 diabetes, stress and aging become important factors in potentiating production mechanisms in both pathological entities. Prolonged stress causes over-adaption of the body's ability to adapt and is a cause in the development of atherosclerotic lesions present in pancreatic arteries, which influence the secretion of insulin in pancreatic beta cells (...) the reduction of blood flow in the irrigated organ (or pancreas) is evidence of a possible relationship between stress conditions and metabolic disorders in type 2 diabetes. [4]

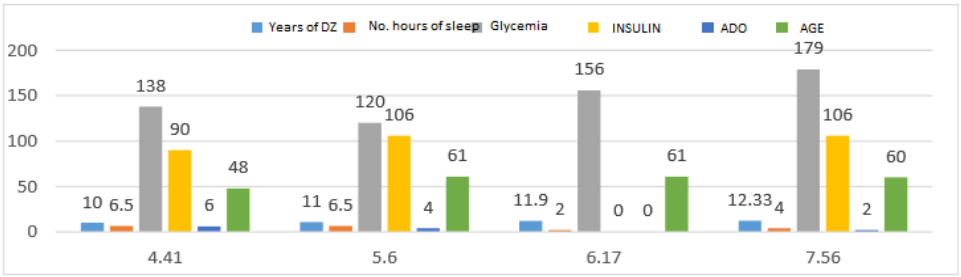

Figure 7. The impact of stress on diabetes and atherosclerosis related to age

Table 3. The impact of the number of hours of sleep and saturated fatty acids on the atherogenic index and glycemic values

No. of hours of sleep	Saturated fatty acids(g)	Atherogenic index	Glycemic values (mg%)
3-4 hours	80	**5,83**	**202**
5-6 hours	19	4,94	144
7	37	4,6	138

Analysing the data in the above chart, it was observed that patients who slept 2 hours a night ingested approximately the same amount of fatty acids as those who slept 5-6 hours

per night, but that the atherogenic index and the mean blood glucose index were higher in patients who were less sleepy.

In those who ingested the highest amount of saturated fatty acids and had an average of low sleeping hours, blood glucose values are the highest in the study group.

Experimental animal studies have shown that the atherogenic index and blood glucose levels increase more rapidly in elderly animals, despite the fact that they all have been subject to the same stressors. [4, 5]

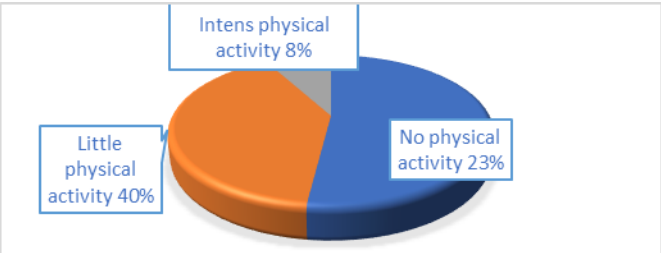

Figure 8. Type of physical activity

Table 4. Numerical representation of the parameters monitored according to the physical activity performed

	No physical activity	Little physical activity	Intense physical activity
No. of cases	21: M-14; F-7	16: M-5; F-11	3: M-2; F-1
The mean of glycemic values	113 mg/dl	162 mg/dl	**104 mg/dl**
Mean blood pressure values	141/88 mmHg	144/85 mmHg	**138/80 mmHg**
Mean of BMI(kg/m2)	37,68 kg/m2	33,65 kg/m2	**30,21 kg/m2**
Average weight	112 kg	97 kg	**88 kg**
The mean of cholesterol	234	191	162
The mean of LDL cholesterol	144	104	93
The mean of HDL cholesterol	38	34	49
The mean of triglyceride values	249	275	86
The average of atherogenic index	6,27	4,25	3,30

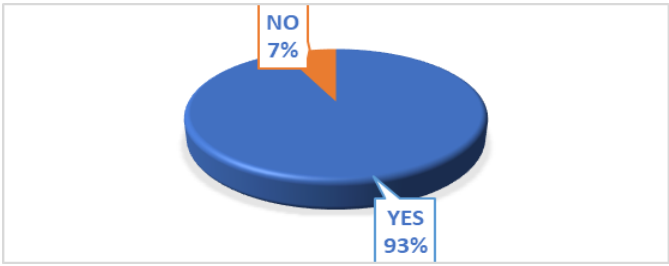

Figure 9. Distribution of diabetic patients according to the presence / absence of obesity

The impact of positive lifestyle on diabetic patients

„Diet 60/25/15" - Standard diet recommended at the Lifestyle Herghelia Center:

CARBOHYDRATES 60%	LIPIDS 25%	PROTEIN 15%	For 1000 kcal/day:
-complex carbohydrates - dietary fiber 50 g - Whole meal bread **- without sucrose**	-saturated 5% -monounsaturated 5% -polyunsaturated 13% -Omega 3 3,8 g - nuts, flaxseed -polyunsaturated acids/ saturated acids: 2,24/1 -zero cholesterol	-only vegetal	-vegetables and fruits: 12 servings -Betacarotene 327% - vit B1- 150% -vit. B3- 124% -vit. B6- 98% -vit.C- 243% -vit E- 153% -folic acid 250% - Mg 155% -Selenium 150% -Fe 225%

Table 5. Variation of the analyzed parameters after 10 days of therapy

	ONSET	DEPARTURE	DOWN with…	INCREASED with..
Weight (kg)	**92,30**	**88,69**	**1,23 kg p‹0,2**	
BMI (kg/m2)	**33**	**31,4**	**1 kg/m2 p‹0,1**	
Glycemic value	**145**	**119**	**26 mg% p‹0,001**	
TAS mmHg	**144**	**130**	**14mmHg p‹0,0001**	
TAD mmHg	**84**	**78**	**6mmHg p‹0,0009**	
Cholesterol mg%	**183**	**159**	**24mg% p‹0,002**	
LDL-cholesterol	**111**	**93**	**18mg% p‹0,001**	
HDL-cholesterol	**37**	**39**		**2mg% p‹0,3**
Triglycerides	**170**	**129**	**41mg% p‹0,01**	
Atherogenic index	**5,00**	**4,38**	**0,62 p‹0,005**	

As we can see, patients' average weight decreased by 1.23 kg, blood glucose decreased on average by 26 mg/dl, total serum cholesterol by 24mg/dl, LDL with 18mg/dl, HDL increased by 2mg/dl, triglycerides decreased by 41mg/dl, systolic blood pressure values decreased by 14 mmHg and diastolic by 6 mmHg.

Daily physical exercise reduces cholesterol, blood pressure, improves insulin sensitivity, helps fight obesity, improves blood vessel tone and responsiveness, lowers blood viscosity (platelet aggregation), and prolongs life.

Experimental studies have shown that physical activity increases insulin sensitivity and improves glucose tolerance, both in those without chronic conditions and in patients with diabetes. Physical effort increases GLUT-4 glucose content in the 70% muscle cell membrane, which will increase the amount of glucose taken up by muscle tissue, by lowering the glycosylated haemoglobin. The risk of developing and aggravating diabetes over the next 6 years may be reduced by at least 40% in those who regularly do sports (even without weight loss) compared to those who adopt a sedentary style. [6, 7]

CONCLUSIONS

The success in the management of diabetes mellitus consists in teaching patients on the importance of diet and exercise for reducing hospital admissions, control the glycemic values and for improving the quality of life.

The risk of type 2 diabetes starts to rise from a normal body mass index and the waist / hip ratio is considered to be a factor much more potent than the body mass index in the occurrence of type 2 diabetes.

Few hours of sleep, high hours of stressful work and divorce are stressful factors that support diabetes and atherosclerosis of pancreatic arteries. Atherogenic index and insulin resistance values were proportional to the length of years of diabetes, low hours of sleep, increased working hours, and older age.

Management of type 2 diabetes (hyperglycaemia) is achieved, in principle, through proper diet and physical exercise; animal protein brings an increased intake of cholesterol and saturated fatty acids, and along with refined carbohydrates rapidly increase blood glucose, leading to glycemic oscillations. Low intake of dietary fibres, whole grains, and low intake of complex carbohydrates increase the risk of type 2 diabetes.

"Diet 60/25/15" is supported today by the American Diabetes Association and the American Dietetic Association and is rich in strong antioxidants, phytochemical, carotenoids, phytoestrogens, phytosterols, flavonoids, isoflavones that reduce the risk of complications of diabetes, lower cholesterol LDL, protects against cardiovascular disease and strengthens the immune system.

Daily physical exercise reduces cholesterol, blood pressure, improves insulin sensitivity, combats obesity, improves blood tone and reactivity, lowers blood viscosity, and prolongs life.

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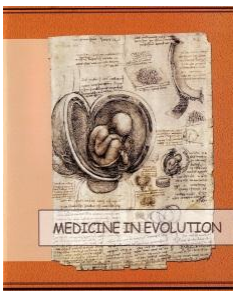
Mitochondria – key organelle for military aviation safety



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Abstract

Aim and objectives: Inserting mitochondria as part of major impact study on military aviation safety and defining the concept,,**operational scientific research**" in military aviation medicine**.**

Material and method: Analytical study, retrospective, historic and descriptive, designed by synthesizing several conceptual studies or relevant scientific modeling conducted during 1997 – 2017, fundamental research of biological mechanisms the human body operates in space.

Results: I introduced, for the first time, mitochondria as a study key organelle for military aviation safety. I detailed some of the cell biology mechanisms which mitochondria influence the physiological processes of the human body in space. I detailed and argued the practical applications of the mitochondrial study of military aviation safety, thus laying the foundations for operational scientific research. I highlighted some of the medico-military and aviation safety issues deriving from the operation of the Romanian Air Force the modern combat aircraft, F 16. I correlated the mitochondrial genetic pathology with the specific mission of the combat aircraft aviator and I highlighted the role of phylogenetic transmission, especially the maternal line, in various mitochondrial diseases.

Conclusions: It is necessary to evaluate the epidemiology of mitochondrial pathology in military aviation and the impact on aviation safety. It is necessary to introduce genetic tests in the aviators periodical medical examinations, to prevent aviation tragedies. An operational scientific research study will be initiated for identification, determination and monitoring the cumulative effect of the chemical toxicity from the space systems on the human body.

Keywords: mitochondria, mitochondrial genetic disease, gravity, aviation safety.

INTRODUCTION

Mitochondria are complex organelles, with multiple features and properties of vital importance in the human body's functioning.

Discovered over 150 years ago, the mitochondrion is an Experimental Biology subject of research, continuous, multidisciplinary [1].

Gravity was one of human concerns from the oldest times and for military aviation, overcoming the force of the gravitational acceleration G [2, 3].

Paradoxically, G force, one of the weakest fundamental forces, influences many of the biological processes and stimulates researchers to investigate perception mechanisms in living organisms [4,5].

Safety (aviation) flight must be a permanent concern both those responsible for the area, *the flight surgeon* and, also the medical community in military aviation medicine [3, 6].

New combat aircraft provided by the Romanian Air Force, F 16, oblige operational military aviation medicine to know a new dimension of evolution, to respond to the complexity of the challenges: physiological, psychological, psychosomatic, biological, chemical, biochemical, physical, biophysical, genetic, toxicological factors [1, 3, 6, 7].

Aim and objectives

Fundamental research of biological mechanisms the human body operates in space. Defining the concept of,,**operational scientific research**" for the military aviation medicine, in the context of new scientific and technological developments. Inserting mitochondria as part of major impact study on aviation safety in military aviation.

MATERIAL AND METHODS

Analytical study, retrospective, historic and descriptive, designed by synthesizing several conceptual studies or relevant scientific modeling conducted in the period 1997 – 2017, in order to obtain a meaningful scientific study.

The data used in the article were identified partly by searching medical databases / aviation medical (Medline, Medscape, Emmbase, Asma, Avmed, RSAM) and military aviation.

The search terms used were:,,mitochondria",,,mitochondrial genetic disease",,,gravity",,,aviation safety",,,Romanian Air Forces".

Data were staged, algorithm-based and have undergone processes of analysis and meta-analysis.

RESULTS

Mitochondria represents for the human cell what the liver is for the human body:,,the energy factory".

Historically speaking, mitochondria (Fig. 1) was, for cell biology researchers, the subject of study in electronic microscopy (Fig. 2), one of the pioneers in this field being George Emil Palade [1, 9].

George Emil Palade was awarded the Nobel Prize in physiology and medicine in 1974 „for discoveries on functional cell organization that have played an essential role in the development of modern cellular biology" [10].

Mitochondria have also been among the concerns of researchers in molecular biology and geneticists of all the time.

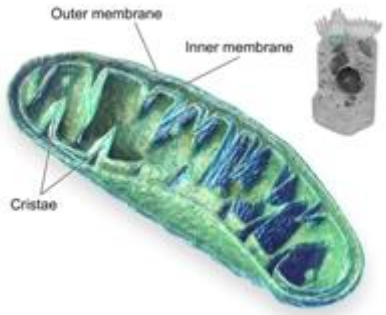

Figure 1. Mitochondria ultrastructure (Blausen et al adaptation) [8]

The discovery of mitochondrial DNA, protein synthesis and the study of mitochondrial biogenesis, they have started a new era in the gene expression of eukaryotic cells.

Henrick Kacser, a Romanian biochemist and geneticist of British nationality, has made an important contribution to the gene transmission of mutations, placing the molecular basis of gene dominance and creating a method of quantitative description of heterozygote versus mutant or wild-type genes [1, 11].

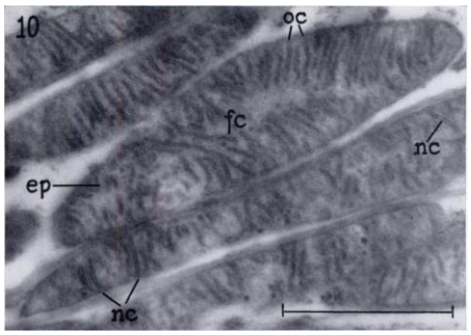

Figure 2. Kidney mitochondria (electronic microscopy made by E. Palade) [1]

On the other hand, overcoming the force of the gravitational acceleration G was also the subject of research for Romanian military aviation with its high value engineers.

Henri Coandă was one of the pioneers of aviation, whose inventions (the Coanda effect) we find in modern combat aircraft configuration (F 16), resulting in greater maneuverability, increasing the capacity of attack, greater flexibility in landing [12, 13, 14, 15].

From the *military aviation safety* point of view, protection against G factor and prevention of G-LOC (loss of consciousness) were the objects of study for aviation researchers [3].

Among the most important factors that decrease the tolerance to G factor are those *respirators* (hypoxia, hypercapnia, hyperventilation, tissue hypo perfusion), *metabolic* (ATP hyposynthesis, different etiologies hypoglycemia, hepatic hypoglycogenolysis), *neurological* (cerebral hypoperfusion, genetic diseases, headache syndrome, stroke history), *muscular* (myopathy, temporary hemiparesis of any etiology), *toxicological* (ethanol, ammonia, hydrazine, monomethyl hydrazine, nitric acid, nitrogen tetraoxide).

Mitochondria, through its roles and functions, provide most of the physiological processes in the human body. Some of these functions, which are the subject of our study, we will detail further:

1. The function of the **oxygen utilization** by the cells is provided by the *aerobic pathway* of the electron transport respiratory chain, oxidative catabolic process, also called oxidative phosphorylation.

The physiological substrate of the mitochondrial respiratory chain is provided by the cytochrome - NADH system (the reduced form of nicotinamide adenine dinucleotide), complex consisting of cytochromes b - c1, the cytochrome oxidase complex a - a3 and the NADH dehydrogenase complex [16].

A practical application of this mitochondrial function, with important consequences for aviation safety is acclimatization to altitude (Fig. 3), after exposure to hypoxic and hypobaric environment. In order to protect itself from the harmful environment and, also to continue functioning optimally, the human body develops several types of defense mechanisms [7].

Processes of Acclimatization and Relevant Terminology

Acute Acclimatization (Accommodation)	*Minutes*	*Rise in Heart Rate, Increased Ventilation*
Chronic acclimatization	Days	Increase in hemoglobin (initial decrease in plasma volume followed by increased red cell mass), increased capillary density
Adaptation	Years	Alterations in hypoxic ventilatory response

Figure 3. Acclimatization processes (Jefrey R. et al adaptation) [7]

2. The **energy generation** function by the cells is provided by coupling the respiratory chain, described above, with ATP - synthase phosphorylation.

The *aerobic pathway* is the most effective method the production of energy required for the functioning of the human body, the resulting energy is about 36 molecules of adenosine triphosphate (ATP), the main intracellular energy resource.

The catabolic *anaerobic pathway* is a less effective way (Fig. 4), selective and harmful in long-term operation.

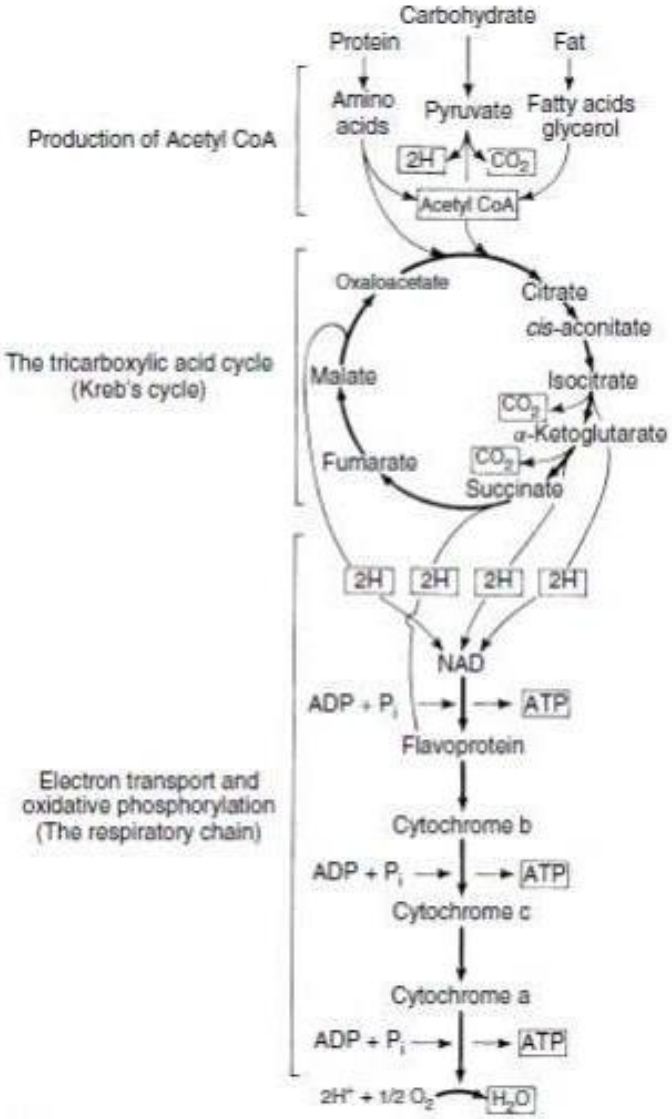

Figure 4. The cellular respiration (Jefrey R. et al adaptation) [7]

Thus, from glucose metabolism, by extra-mitochondrial glycolysis, only 2 molecules of ATP and different toxic products with slow release in the body (lactic acid) are produced. Other potential catabolic energy resources (fatty acids, amino acids) cannot be a substrate for the anaerobic pathway [7].

3. Selective **membrane transport** function of the metabolites, with the regulation of membrane permeability, is the main mechanism that helps cells to pass from survival to death by apoptosis. Mitochondrial dysfunction is found in most liver diseases such as: *nonalcoholic liver steatosis (nonalcoholic fatty liver disease - NAFLD), nonalcoholic steatohepatitis (NASH),* drug-induced *hepatotoxicitaty*, *viral hepatitis* and *hepatic cancer* [17].

Another application of this feature is found in the *ischemia / reperfusion* lesion, which occurs during cardiac, cerebral or hepatic surgery [18].

Nitrogen is transported to the liver in free form of ammonium ion or aminoacids, most, glutamine and alanine [19].

Enzymes involved in hepatic detoxification of ammonium and urea synthesis (glutamate dehydrogenase, carbamoyl phosphate synthase and ornithine transcarbamylase) are represented exclusively in hepatic mitochondria.

Due to the fact that both glutamine and glutamine synthetase are enzymes located in the liver, protein metabolism and glutamine synthesis are running in hepatic mitochondria, mainly [17].

A practical application of this mitochondrial function, with major impact on military aviation safety, is represented by *ammonia metabolism*, resulting from decomposition of ***hydrazine***.

Hydrazine, a highly toxic substance for the eye, respiratory system and skin, It is used as a fuel reserve for combat aircraft F 16 and is catalytically converted to ammonium ion and water vapor [7].

Another practical application, potentially toxic to the body and impacting aviation safety, is the phenomenon of *supersaturation*, during decompression. By this phenomenon, an amount of inert gas from the tissues can diffuse through the blood into the lungs and then into the expired air, leaving the remaining amount of gas dissolved in the blood being directly proportional to the absolute value of the environmental atmospheric pressure (Henry's theory of gas) [7].

Considering the above arguments and scientific data, we can postulate that mitochondria is the meeting point between different metabolic pathways, metabolic stressors and apoptosis in hepatocytes [17].

Thus, a new advanced study is necessary, for testing the etiological hypotheses in environment exposed group risk and social negative impact, using the indicators of social impact assessment: DALY, QALY, HLY [18,19].

5. *Replication and transcription* function of mitochondrial DNA

Human cells contain between 500 and 2,000 mitochondria, each of these organelles having its composition two to ten molecules of double-stranded circular DNA. The nucleotide sequence of the mitochondrial DNA was completely deciphered in 1981, revealing some particular elements of the mitochondrial genome, different from the nuclear genome. Mitochondrial DNA is not associated with histonic / nonhistonic proteins and almost does not contain repetitive DNA. Another hypothesis argues that mitochondria have evolved from certain species of prokaryotes.

Thus, considering the above data, we can conclude that mitochondrial genetic system is,,unique" [1, 23].

A practical application of this function, with a major impact on military aviation safety, is the inter-individual variability of the human body's response to the administration of a given toxic substance, depending on the genetic predisposition, age, gender, state of health or previous exposures to that substance.

An example of a toxic substance, applicable to aviation and airspace, is the ethanol. Thus, for each individual, genetic determinations should be made, to identify the,,genetic fingerprint" of the potency of individual reactivity to the action of the toxic substance [7].

The mitochondrial pathology is found in many medical specialties, being one of the subjects of interdisciplinary study.

The epidemiology of general mitochondrial pathology shows an incidence of 1 to 4,000 people, without concrete data about incidence or prevalence of each condition, separately [24].

Among mitochondrial disorders, the most significant for our study and aviation safety, are the mitochondrial genetic diseases, transmitted on maternity line: *MELAS syndrome*, *MERF syndrome* and *hereditary optic neuropathy Leber*.

MELAS syndrome is defined as a genetic disease that carries a number of disorders: mitochondrial (**M**), encefalomyopathy (**E**), lactic (**L**) acidosis (**A**) and stroke-like attacks (**S**) [25]. The disease begins in childhood, followed by a respite, with weakness and muscle pain, headache syndrome, loss of appetite, vomiting, vertigo and stroke-like attacks [27].

Other manifestations of the disease, of interest for our study, are: disturbances of consciousness, migraine syndrome and visual disturbances [26].

MERRF syndrome is defined as myoclonic (**M**) epilepsy (**E**), with red (**R**), ragged (**R**), muscle fibers (**F**). The main manifestations of the disease, that can affect aviation safety, are: hearing loss, accumulation of lactic acid in the muscle fibers, low tolerance to physical effort, low night vision [28].

LEBER hereditary optic neuropathy or optic neuropathy is defined as degeneration of retinal nerve fibers, with the irreversible loss of central vision. The first symptoms of the disease are blurred vision, to one eye or to both eyes, with the gradual and painless loss of vision [28].

The hereditary transmission of mutant mitochondrial DNA, exclusively on maternal line (heteroplasmy), has enabled lineage studies and to re-establish the maternal line of human populations at the origin of humanity, constituting the concept of a common African ancestor on the maternal line, symbolically called,,mitochondrial EVE" (Fig. 5) or,,continental travels" of our ancestral relatives [23].

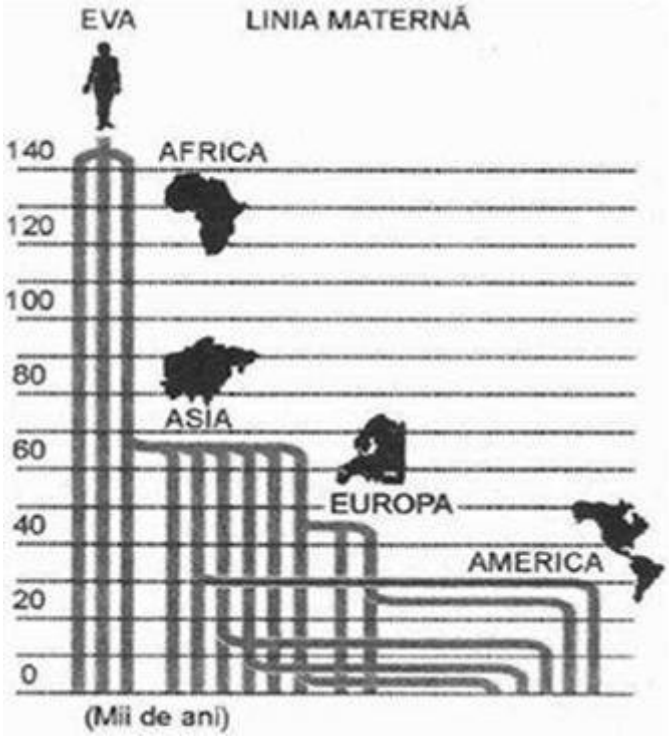

Figure 5. Mitochondrial EVE (Covic M. adaptation) [23]

Thus, the physiological factors (micro and macroscopic), metabolic, genetic, toxicological are equally important for military aviation medicine, as well as other factors studied and documented in the literature (physical, mental, psychological), having a key role in aviation safety.

Military aviation medicine and its component, operational military aviation medicine, is facing new challenges, both medical and military, and it is necessary to redefine its place and its role in military medicine, analyzing and developing its capabilities and the augmentation of the potential development in medical research.

The emergence types of modern flight, air pressure variability in the environment, both for civil transport aircraft and in future space exploration missions, simultaneously with rapid transport of military and civilian personnel, obliges the specialist in aerospace medicine to become familiar with the new operational concepts [7].

Considering the arguments set out above and evaluating the,,active" research potential, in our operational structures, we propose the establishment, definition and development of the concept,,***operational scientific research***", with the involvement of all levels actors.

CONCLUSIONS

1. Epidemiology of mitochondrial pathology evaluation, both in military and civil aviation, and the impact on aviation safety.
2. Establishing the mechanism by which mutations in mitochondrial DNA determine neurological damage, increasing the occurrence of G-LOC.
3. Creating a correlation algorithm between liver and mitochondrial pathology.
4. Investigation of correlative relationship between mitochondrial and psychiatric pathology in military aviation.
5. Inserting the genetic testing (including liver disease and toxic susceptibility) in the periodic medical examination of aviators, as an additional measure to prevent aviation tragedies.
6. The concept of,,operational scientific research" will become a duty assignment for the flight surgeon, with a decisive role for military aviation medicine and military aviation safety.
7. Identify, determine and monitor the cumulative toxic effect of the chemical substances in space systems on the human body, in the context of introducing the new combat aircraft into the Romanian Air Forces.

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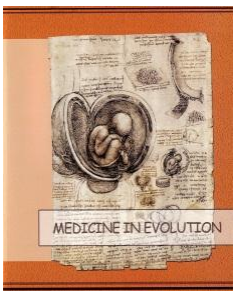
The art of behavioral management in pediatric dentistry



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Abstract

This article will help dental practitioners to find out how to manage better the relationship with children.

The overall goal of the article is to provide a brief review regarding the main techniques of behavioral management in pediatric dentistry

Keywords: behavior, management, dental fear, child.

INTRODUCTION

Behavior management is an essential skill and should be acquired by all members of a dental team treating children.

Treating a crying child is one of the most difficult job for a dentist, so the aim of behavior management is to instill a positive dental attitude in the anxious patient,deliver quality dental care, build a trusting relationship between dentist, child, and parent and create long-term interest on patient's part so as to facilitate ongoing prevention and improved dental health in the future [1]. So, it is important that dentists have a wide range of behavior guidance techniques to meet the needs of the individual child and be tolerant and flexible in their implementation [2,3].

DEFINITION

Behavior management refers to the application of various techniques by which the dental health team effectively and efficiently performs dental treatment and thereby instills a positive dental attitude in the patient and behavioral guidance is the process by which medical staff help patients identify appropriate and inappropriate behavior and learn problem solving strategies.

Dental fear and anxiety are the main causes of dental avoidance that leads to deterioration of one's oral health and may impair ones psychosocial functioning and quality of life [4]. Dental fear is an inevitable emotion that appears as a response to the stress induced by various dental procedures. Its intensity varies from nervousness and anxiety to dental phobia and it is considered to be the main barrier for successful completion of treatment [5,6].

Different anxieties fears that children have about visiting the dentist are:

- the uncertainty about what is going to happen, a new experience.
- past negative experiences associated with medical treatment involving pain. Children who have had negative experiences associated with medical treatment may be more anxious about dental treatment [7,8]. Prevention or reduction of pain during treatment can nurture the relationship between the dentist and the patient, build trust, allay fear and anxiety, and enhance positive dental attitudes for future visits [9]. Much more, misinterpreted or ignored changes in behavior due to painful stimuli can cause sensitization for future appointments as well as psychological trauma [10].
- previous fearful dental visits have also been related to poor behavior at subsequent visits.When taking medical history, it is important to ask the parents about previous treatments and the child's response to them.[11]
- the attitude of parents who are unable to contain their own dental anxieties. Bailey et al (1973) reported that there was a relationship between maternal anxiety and child management in children of all ages, especially those aged 4 years or younger [12].
- mass media and cartoons can also contribute to the negative image of the dentist that may lead to development of dental fear.

For managing a child in dental office various factors have to be seen like - the type of behavior, the child's anxiety, age of the child, child rearing techniques, personality variables, parental attitudes toward behavior management techniques, dental treatment to be rendered and the legal implications [13].

Figure 1. The main techniques of behavioral management

I.Preappointment behavior modification:

1. Films or videotapes have been developed to provide a model for the young patient. The goal is to have the patient reproduce behavior exhibited by the model. On the day of the appointment, or perhaps at a previous visit, the new pediatric patient views the presentation.

2. Live patient modes: such as siblings, other children, or parents. Many dentists allow young children into the operatory with parents to preview the dental experience.

3.**Positive pre-visit imagery**

Patients are shown positive photographs or images of dentistry and dental treatment in the waiting area before the dental appointment [14].

3. Preappointment mailings: precontact with the parent can provide directions for preparing the child for an initial dental visit and therefore can increase the likelihood of a successful first appointment. Precontact offers a practical approach for teaching parents how to prepare their children for a first dental visit.

4.**An evaluation of the child's cooperative potential** is essential for treatment planning. Initially, information can be gathered from the parent through questions regarding the child's cognitive level, temperament/personality characteristics,anxiety and fear, reaction to strangers and behavior at previous medical/dental visits, as well as how the parent anticipates the child will respond to future dental treatment [10].

II.Behavior shaping means providing the child with cues and reinforcements that direct them toward more desirable behaviors. Traditional behavior shaping strategies effective in the dental office include Tell-show-do (TSD), modeling and distraction.

1. **Tell-show-do**

This is a technique ofdesensitization which is widely used to familiarize a patient with a new procedure, while minimizing the fear of the unknown.

Tell-show-do involves verbal explanations of procedures in phrases appropriate to the developmental level of the patient (tell); demonstrations for the patient of the visual, auditory, olfactory, and tactile aspects of the procedure in a carefully defined, nonthreatening setting (show); and then, without deviating from the explanation and demonstration, completion of the procedure (do). The tell-show-do technique is used with communication skills (verbal and nonverbal) and positive reinforcement [2,15,16,17].

The objectives of tell-show-do are to:

- teach the patient important aspects of the dental visit and familiarize the patient with the dental setting
- shape the patient's response to procedures through desensitization and well-described expectations.

2. Ask-tell-ask

This technique involves inquiring about the patient's visit and feelings toward or about any planned procedures (ask); explaining the procedures through demonstrations and non-threatening language appropriate to the cognitive level of the patient (tell); and again inquiring if the patient understands and how she feels about the impending treatment (ask) [18].

The objectives of ask-tell-ask are to:

- assess anxiety that may lead to noncompliant behavior during treatment;
- teach the patient about the procedures and how they are going to be accomplished;
- confirm the patient is comfortable with the treatment before proceeding.
- assess the patient's informational needs. Instead of asking, "Do you have any questions?" to which patients often reply, "No," instead ask, "What questions or concerns do you have?" Be sure to ask, "Anything else?"
- assess the patient's knowledge and understanding

3.Voice control

Voice control is a deliberate alteration of voice volume, tone, or pace to influence and direct the patient's behavior.

The objectives of voice control are to:

- gain the patient's attention and compliance;
- avert negative or avoidance behavior;
- establish appropriate adult-child roles.

4.Nonverbal communication

Nonverbal communication is the reinforcement and guidance of behavior through appropriate contact, posture, facial expression, and body language [19,20]. Observation of the child's body language is necessary to confirm the message is received and to assess comfort and pain level [9].

Communication may be impaired when the sender's expression and body language are not consistent with the intended message. When body language conveys uncertainty, anxiety, or urgency, the dentist cannot effectively communicate confidence in her clinical skills [21].

The objectives of nonverbal communication are to:

- enhance the effectiveness of other communicative management techniques
- gain or maintain the patient's attention and compliance

5. Distraction

Distraction aims to shift the attention of the patient's attention away from the dental procedure. This may be in the form of music, cartoons, or stories. Another well recognized method is for dentists to talk to patients as they work so that patients listen to them rather than focusing on the procedure..[21]

More sophisticated diversion techniques include the use of video, music, or video which can help in eliminating dental sounds and sight of the dental treatment, hence helping in gaining control of the child [22,23].

The objectives of distraction are to:

- decrease the perception of unpleasantness
- avert negative or avoidance behavior.

6. Positive reinforcement

The most powerful reinforcers are social stimuli, such as verbal (positive reinforcement:"*You're doing great*", "*That's good*", "*The way you keep your mouth open its amazing*"), positive voice modulation, facial expression, approval by hugging [24].

7. Memory restructuring

Memory restructuring is a behavioral approach in which memories associated with a negative or difficult event (eg, first dental visit, local anesthesia, restorative procedure, extraction) are restructured into positive memories using information suggested after the event has taken place [25].

8. Cry Analyser

Even if there are very few studies done to evaluate the efficacy of audio analgesia pediatric dental patient we consider that the advantages of this must not be ignored.

Gardner and Licklide which introducted this technique in 1959, originally listed seven factors contributing to the audio analgesic effect [27]:

- The noise appears to directly suppress the pain caused by dental operation.
- The noise removes a source of anxiety by masking the sound of the dental drill.
- The music, and the noise, which sounds like a waterfall, has a relaxing effect.
- When both music and noise are presented, the music can be followed only through concentration which distracts attention away from the dental operation.
- Active participation gives the patient a feeling of control over a situation which formerly seemed completely out of his hands.
- The dentist can judge the patient's state of anxiety or discomfort by noting whether the patient is using music or noise, and by observing the intensity of each signal.

In one study, S.Ajinkya, R.Talathi, C.Yussuf and M.Abdul evaluated and compared audio analgesia in management of anxious pediatric dental patient using cry as a parameter [26]. They identified the following types of cries that are commonly encountered:

- **Pain cry**: This cry is characterised by nonstop and uncontrollable crying which is high pitched and loud.
- **Frightened cry**: This cry is characterized by a sharp shrilled extremely high pitched cry followed by small breath catching sobs followed by a sharp shrilled extremely high pitched cry.
- **Obstinate cry**: it is loud high pitched & characterized as a siren like wail, a pause and repeated over and over again. This forms a belligerent cry, represents the child external response to anxiety. Child throws a temper tantrum to thwart dental treatment.
- **Compensatory cry**: Slow monotonous cry, the crying serves to "compensate" for the noise. It's a kind of coping mechanism to unpleasant stimuli.

In their study audio analgesia was used as a behaviour guidance technique considering cry as a parameter. The choice of music was left to the patients, to allow the child to gain control over the unpleasant stimulus and give them feeling of being in familiar environment.

CONCLUSIONS

A key component of reducing anxiety in children is to use a technique of behavioral management. Nowadays the balance has shifted toward non-aversive techniques and dentists have a wide range of behavior techniques to meet the needs of the youngest people.

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Dental Hygienist

Full title: European Training Platform for Continuing Professional Development of Dental Hygienist
Start: 2015/09/01
Finish: 2018/08/31
Programme: ERASMUS+
Sub-Programme: Key Action – Strategic Partnership
Coordinator: Karolinska Institutet

Oral health is a determinant factor for quality of life, essential for well-being, and an integral part of general health.

Our mission is to promote oral health and the cost effective prevention of oral diseases in Europe. In the EU, the socio-economic burden of oral diseases is considerable: they affect the majority of school-aged children and adults and account for 5% of public health spending". The European Platform for Better Oral Health.

The dental hygienist is the key provider of preventive oral care in order to promote and improve the oral health of individuals, families and groups in society. The European inequality in access to oral health care can be tackled by harmonisation of dental hygienist education on ground level and increasing access to continuing education.

The goals of EuHyDens are:

- ✔ Demonstrate the importance and role of dental hygienists in the society by improving skills and knowledge.
- ✔ Harmonization of dental hygienists qualifications in Europe.
- ✔ Recognition of the dental hygienist profession in all EU-member states.
- ✔ Mobility of dental hygienists and cross-border cooperation among stakeholders
- ✔ Strengthen the position of dental hygienists by encouraging entrepreneurship activities and by promoting communication and mobility among the dental hygienists within the EU-nations.

KAROLINSKA INSTITUTET, Sweden

Institute of Entrepreneurship Development, Greece

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UNIVERSIDADE DE LISBOA, Portugal

European Dental Hygienists Federation, Spain w

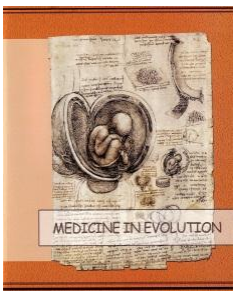
SC AFRA SRL, Romania

Praktikertjänst AB, Sweden

UNIVERSITATEA DE MEDICINA SI FARMACIE 'CAROL DAVILA' DIN BUCURESTI, Romania

Erasmus+

Digital versus conventional impressions: a comparative evaluation of student and dentist's perception



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Abstract

The aim of this study was to the evaluate differences in perception between experienced prosthodontics specialists, residents and students, regarding conventional and digital impressions, and also to determine which method is more time efficient.

Material methods. Five prosthodontic specialists, five prosthodontic residents and four dental students, made conventional and digital impressions on a typodont model mounted on a manikin. Working times for both impression techniques were recorded and compared. A multiple choice questionnaire was used to assess the participant's perception, preference and effectiveness regarding both techniques and the results were statistical evaluated.

Results. Overall results showed that the digital impression was the preferred method among all test groups and also was the most time efficient.

Conclusions. The null hypothesis that digital impressions is faster and more efficient was confirmed. According to the operator's perception the digital impression technique was accepted as the preferred and effective technique.

Keywords: *conventional impression, digital impression, time efficiency, operator's perception*.

INTRODUCTION

Nowadays patients demand a more time efficient workflow in the dental office, but at the same time maintaining quality treatments and accurate clinical results(1). CAD/CAM technology and intraoral scanning may provide a better optimized workflow with an increased comfort for the patient and with a similar precision to the conventional treatment.(2) Working with a digital system has advantages such as reduced time for taking an impression, removes the risk of transmitting disease to the dental office, absence of distortion from the impression material and last but not the least an improved patient acceptance(3-7).

Digital impression techniques are a clinically acceptable alternative to conventional impression methods for the fabrication of crowns and short FDPs. For fabrication of implant-supported crowns and FDPs, digital impression systems also result in clinically acceptable fit. Digital impression techniques are faster and can shorten the operation time. Based on this study, the conventional impression technique is still recommended for full-arch impressions (8). On the other hand, the marginal and internal fit is also a very challenging issue and there are already some studies that reveal the superior accuracy of the digital impression compare to conventional impression (9,10, 11, 12). There are also some studies that reveal no difference between conventional and digital impression regarding the marginal fit discrepancy (13, 14).The digital impressions should be as accurate and efficient as conventional impressions. Comparisons were made with clinically relevant data (15).

The aim of this clinical trial was to evaluate the effectiveness and operator's perception towards the digital impression technique compared to the conventional impression technique. The null hypothesis was that digital impressions are faster, more efficient and more ''user friendly'' than conventional impression.

Objective

The aim of this study was to evaluate the operator's perception between dental students, prosthodontics residents and experienced clinicians when making digital and conventional impressions and to determine which is the most time efficient method.

MATERIALS AND METHODS

The study was realized in the Department of Prosthodontics, Faculty of Dentistry, University of Medicine and Pharmacy "Victor Babes" Timisoara, Romania. Five prosthodontic specialists, five prosthodontic residents and four students made conventional and digital impressions on a typodont model prepared for fixed partial denture model mounted on a manikin.

Conventional impression

The proper tray for both arches was selected (Fig. 1). Each operator took one step single impression for both arches, the upper with the prepared abutment and the lower with opposing teeth, using addition silicone with two consistencies (putty and low viscosity). This resulted in a total number of 14 impressions. The effectiveness and clinical outcomes of the conventional impression technique was evaluated by measuring the total treatment time, including the individual steps: A) mixing the silicone B) placement of the impression material in the tray, and C) actual impression procedure(upper and lower impression). The treatment time was measured in seconds and recorded for each step by a second operator.

Figure 1. Half arch conventional impression

Digital impression

The next step was to take the digital impression of the prepared tooth (Fig.2). The digital impressions were performed using the introral scanner PlanScan, Planmeca. Each operator scanned the upper and the lower areas of interest and also the bite registration was recorded(Fig 3). All digital scanning procedures were carried out according to the manufacturer's guidelines and performed by each operator. The overall scanning times were recorded in seconds.

Figure 2. Digital impression of the prepared tooth

After scanning upper arch, lower arch and the buccal bite, digital model were obtained and analized.(Fig.3).

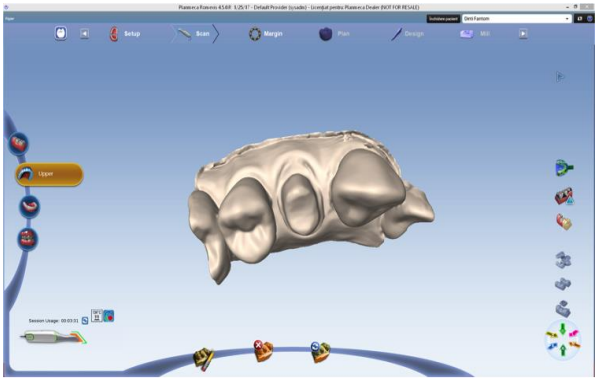

Figure 3. Digital model of the prepared abutment

The operators were asked to fill a questionnaire regarding their opinion towards both ways of taking the impression, and their answers were quantified. The questionnaire included the following questions:

1.Which was the preffered impression technique?

2.Which impression technique was more efficient?

3.Which impression technique do you believe will allow you to become more proficient?

For time efficiency statistical analysis was performed using paired T-test within each group followed by ANOVA test when all three groups were compared.

RESULTS

Time efficiency for both impression techniques is presented in Table 1.The mean overall impression times in the specialist group were statistically significantly different between conventional and digital impression, with a p value of 0.04. In the resident and student groups, the differences between impression times were extremely statistically significant, with a p value lower than 0.001.

The mean overall treatment time of the conventional impression technique was the lowest for the clinician group with a value of 281±68.25 sec followed by the resident group (344.8±8.14) and the student group(346.25±16.68). However the results were not statistically signifiant with a p value of 0.058.

The mean overall treatment time for the digital impression was the lowest for the resident group with a value of 141.4±23.21 sec followed by the student group (186.25±43.01 sec) and the specialist group(196.2±74.77 sec). In this situation as well, the results were were not statistically signifiant with a p value of 0.25(Table 2).

Table 1. Time efficiency for both impression techniques(Statistical significance level p-0.05

	Conventional Impression Time(sec)	Digital Impression Time(sec)	p-Value
Specialist	160	106	
	311	235	
	297	301	
	322	182	
	315	157	
Mean	281	196.2	
Standard deviation	68.25	74.77	
Paired t- Test	→→→→		0.0449
Prosthodontics Resident	341	178	
	347	137	
	344	122	
	335	148	
	357	122	
Mean	344.8	141.4	
Standard deviation	8.14	23.21	
Paired t- Test	→→→→		0.0001
Student	322	141	
	355	199	
	349	165	
	359	240	
Mean	346.25	186.25	
Standard deviation	16.68	43.01	
Paired t- Test	→→→→		0.0018
	↓↓	↓↓	
Anova Test	p-value is 0.058275	p-value is 0.25878	

Table 2. Mean overall treatment time. All data are presented as mean ± SD(Statistical significance level p-0.05.)

Group	Conventional	Digital	p Value
Specialist	281±68.25	196.2±74.77	0.0449
Resident	344.8±8.14	141.4±23.21	0.0001
Student	346.25±16.68	186.25±43.01	0.0018

63.3% of the participants declared that the preferred impression technique was the digital impression, followed 28.6% of the participants having no preference over the type of impression, and last those who preferred the conventional impression, 7.10% (Fig.4).

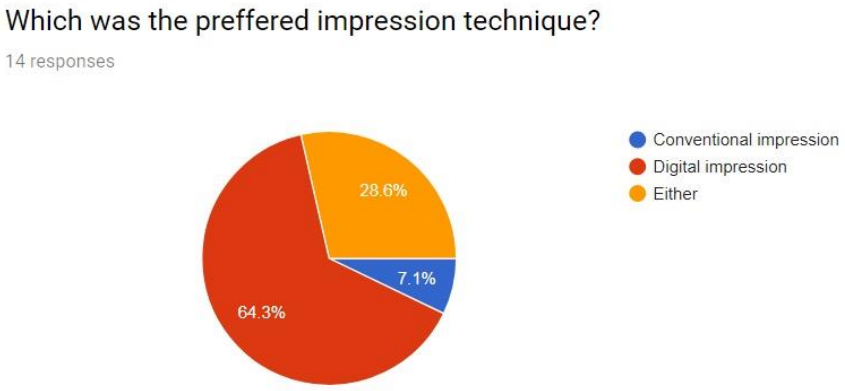

Figure 4. Graphical representation of operator's preferences regarding the impression techniques

Regarding the efficiency, 92.9% considered that the digital impression allows for a better workflow in the dental office, while 7.1% chose the conventional impression (Fig.5).

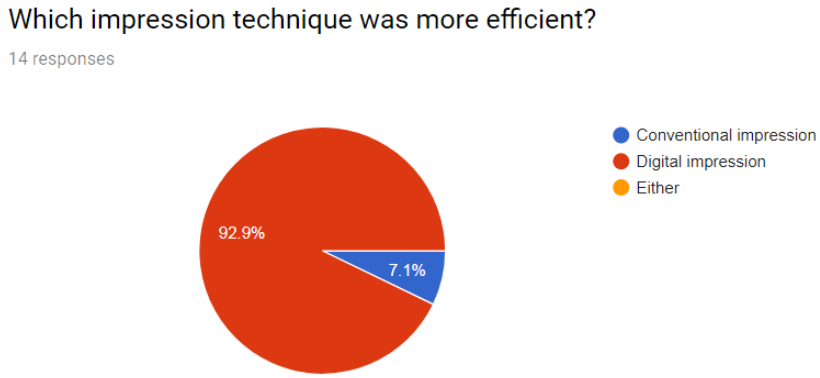

Figure 5. Graphical representation of operator's opinions regarding impression efficiency

78.6% of the participants believed that digital impressions will allow for better future clinical results while 21.4% declared that either type of impression can lead to proficient results (Fig.6).

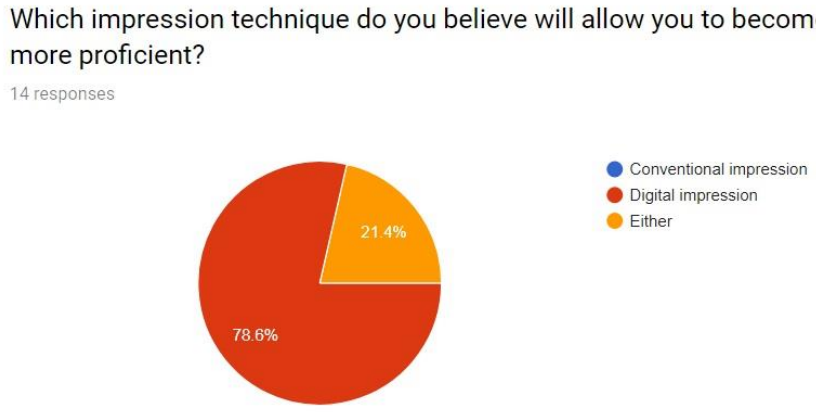

Figure 6. Graphical representation of operator's opinions regarding future results with either type of impression

DISCUSSIONS

There are only a few studies regarding the patients' and dentists' perception of the type of impression: conventional or digital (15, 1). The study realized by Lee & all(10) concludes that the conventional impression was more difficult to perform for the student group than the clinician group; however, the difficulty level of the digital impression was the same in both groups. It was also determined that the student group preferred the digital impression as the most efficient impression technique, and the clinician group had an even distribution in the choice of preferred and efficient impression techniques. In this study in all three groups, digital impression was the preferred method. Also the digital impression was more efficient than the conventional method and as a result the null hypothesis was confirmed.

The test groups were standardized and homogenized by including operators who had little or no experience with digital and conventional impressions in their dental history.

In this study the primary focus was on the time efficiency and the preference of the operators regarding the two impression techniques. However, due to the fact that this was an *in vitro* study, the measurements were made in the absence of clinical factors such as: patient temperature, presence of saliva, patient movements, humidity levels and as such, *in vivo* measurements may generate different results. Also the precision of each impression was not taken into consideration and only visual inspection of the impressions was performed.

The results of this study have revealed clinical evidence that the digital impression technique can be applied successfully for the impressions of restorative procedures based on clinical outcomes and the operator's preferences.

The major advantage of digital impressions is reducing the chair time. The results of study indicate that the efficiency outcomes of the digital impression technique were higher than that of the conventional impression technique, with respect to treatment time taken up and the perceptions of the operators.

CONCLUSIONS

Within the limitations of this study, the following conclusions can be drawn:

1. The conventional impression technique was less efficient than the conventional impression technique. The overall treatment time for the digital impression technique was shorter than that for the conventional impression technique. Thus, the null hypothesis was confirmed.

2. When compared with the conventional impression technique, the digital impression technique was accepted as the preferred and effective technique, according to the operator'sperception.

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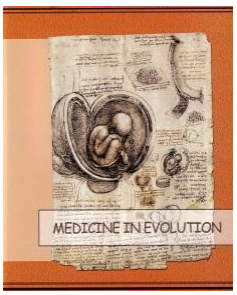
Esthetic and functional results using orthodontic appliances in patients with oral habits in mixed dentition



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Abstract

Thumb sucking and tongue thrusting are the most common oral habits. These habits develop during the early stages of life, but if they persist during the mixed dentition stage, they can lead to various modifications and the development of malocclusion and esthetic problems.

This article describes two cases of patients with mixed dentition and esthetic modifications due to oral habits such as thumb sucking and tongue thrusting. The cases shown have been successfully treated by removable, respectively fixed tongue crib orthodontic appliances. Both cases show satisfactory correction of habits and esthetic results.

Keywords: oral habits, habit breaking appliance, mixed dentition, orthodontics.

INTRODUCTION

Oral habits, some of which include thumb sucking, thumb biting, lip sucking, tongue thrusting and mouth breathing, are known to produce various destructive effects on the oro-facial system [1, 2]. The harmful and lasting effects of any habit are influenced by a series of factors, such as duration, intensity and frequency of the habit per day. [1,4]

Prolonged thumb sucking habits and tongue thrusting are the most commonly seen repetitive behaviours, both of which can lead to a number of side-effects, including aesthetic problems. [3, 6]

Thumb sucking habit is characterized by the repeated and forceful sucking of the thumb, associated with a strong contraction of the lip and buccal musculature. It is considered a normal childhood behavior up to the age of 3-4 years, but if the habit extends into the mixed dentition, it can lead to a series of problems: development of anterior open bite, increased overjet, labial inclination of the upper incisors associated with lingual inclination of the lower incisors, Class II malocclusions, but also compensatory tongue thrust. [1,5]

Tongue thrusting habit consists in the protruding of the tongue through the incisors during swallowing, but also when the tongue is at rest. This habit can happen when the transition between infantile and adult swallowing pattern is delayed. Tongue thrusting can be associated with other oral habits, such as mouth breathing and can also lead to open bite, overjet and Class II malocclusions. [1]

The treatment of oral habits during mixed dentition consists in the elimination of the etiology, retraining exercises and use of orthodontic appliances. The tongue crib appliance is a very efficient habit breaking appliance. It forms a mechanical barrier and prevents tongue thrusting between the frontal teeth, but also the placement of the thumb inside the mouth, limiting thumb sucking. Patient compliance is something that has to be taken into consideration when choosing a habit breaking appliance. Thus, for the treatment of oral habits, there is a choice between removable and fixed tongue crib appliances. [3]

This article presents 2 cases in which the aesthetic problems that resulted from tongue thrusting and thumb sucking habits were successfully corrected using orthodontic appliances.

CASE REPORTS

Case 1

The patient was a 7 year old boy whose parents' main complaint was "the appearance of the frontal teeth". Intraoral examination showed mixed dentition and an open bite. The patient had proclined and rotated upper central incisors, increased overjet and a slight midline deviation (Fig. 1). Functional examination suggested atypical swallowing with tongue thrusting habit.

Figure 1. Pre-treatment intraoral aspect

Treatment Progress

In the beginning, the patient and his parents were made aware of the association between the aesthetic problems and the tongue thrusting habit. The selected treatment was a removable acrylic orthodontic appliance, with a labial bow, an active baseplate in order to achieve palatal expansion and a tongue crib for preventing the patients' habit from continuing (Fig. 2).

The patient was also trained to swallow correctly, and was asked to regularly do tongue exercises, the goal being to achieve an adult swallowing pattern. The patient was recalled for checkup every month.

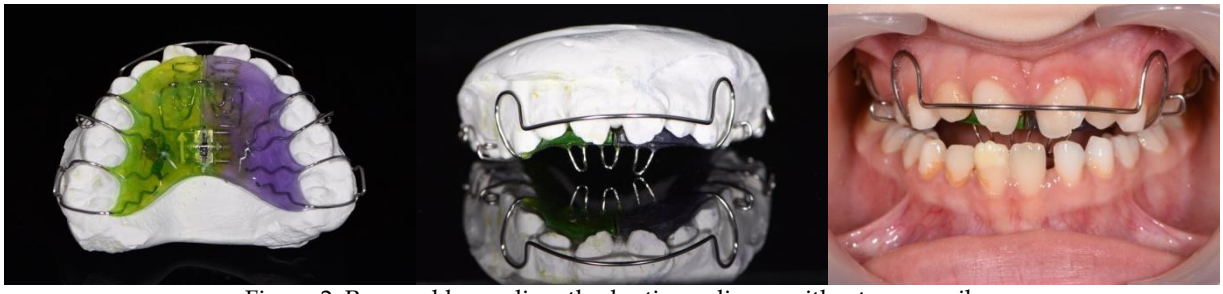

Figure 2. Removable acrylic orthodontic appliance with a tongue crib

Treatment Results

At the end of the 11-month treatment, the open bite was successfully corrected, retroclination of the upper central incisors and a normal overjet were achieved, and the aspect of the smile improved significantly (Fig. 3). The patient and his parents were satisfied with the aesthetic treatment results.

Figure 3. Post-treatment intraoral aspect

Case 2

A 9 year old girl presented with a complaint of "forwardly placed upper teeth". The parents reported that the child had a thumb sucking habit. Intraoral examination revealed mixed dentition and damage due to the child's habit, that was localized in the upper left side of the mouth. The patient had proclined upper incisors on the left side.

Figure 4. Pre-treatment intraoral aspect

Treatment Progress

The effects of the thumb sucking habit were explained to the child and she was asked to discontinue the habit. The initial treatment start was with a removable plate, without achieving the compliance of the patient, The choice of treatment was a fixed habit breaking appliance with a tongue crib, with molar bands that were placed and cemented on the upper first molars, associated with a removable acrylic palatal expander (Fig. 5).

Figure 5. Removable orthodontic appliance and fixed habit breaking appliance with tongue crib

Treatment Results

After a 2-year treatment, the proclination of the upper left incisors was corrected and satisfactory aesthetic results were achieved. (Fig.6)

Figure 6. Post-treatment intraoral aspect

DISCUSSIONS

The patients with mixed dentition had a history of tongue thrusting, respectively thumb sucking and both of them complained of the aspect of their teeth due to these oral habits, their main goal being fixing the aesthetic problems.

The orthodontic appliances proved useful in resolving these issues. Both the removable and the fixed habit breaking appliances with a tongue crib were efficient in discontinuing the oral habit. The patients' compliance to stop the damaging oral habit was also a very important factor that helped achieve the positive results.

Thus, in cases with satisfactory patient compliance, aesthetic problems due to various oral habits can be corrected successfully, using a fixed or removable habit breaking appliance.

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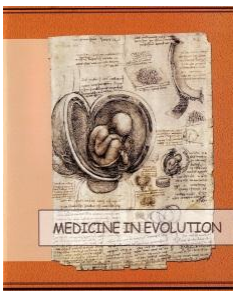
A retrospective study analyzing the differences in orthodontic measurements between active orthodontic treatments with transpalatal arches, and those with molar anchorages



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Abstract

Aim and objectives: to compare mesial movement of the upper first molars after orthodontic extraction with two types of anchorage methods; namely, the transpalatal arch (TPA), and molar anchorage.

Material and methods: 16 patients were included in the study (8 with TPA, 8 with molar anchorage). Data was collected from 2 cephalograms and 2 casts for each patient, one set was taken before and another one after the treatment. On the casts the measurements were: the first inter-molar distance; the anterior dental arch length; the distance between the first molars (left and right) in the sagittal plane; the angle between the mesiobuccal cusp of the upper first molars, and the median. The cephalograms were processed using Ricketts analysis.

Results: The only difference between the parameters of the two groups was showed in the angles between the mesiobuccal cusps of the upper first molars and the medians (p=0.038).

Conclusions: No important differences were demonstrated between the two types of anchorages.

Keywords: anchorage loss, transpalatal arch, orthodontics

INTRODUCTION

Different types of malocclusion are treated in association with extractions. Patients that can benefit from this form of treatment are, for example, the ones with short arches, with anterior crowding, or with a deviated median line. [1]

Even though there is controversy surrounding extractional treatment, studies have shown that treating class II/1 cases with premolar extraction will not determine a distal movement of the mandible with a negative influence of the facial esthetics.[2, 3] Other studies analyzed patients (that were class II and were treated with extractions) 15 years after the treatment was performed. They could not find any negative effect of the extractions over the facial esthetics or the mandibular position. [4, 5]

The extractions are necessary especially when there is a severe lack of space. That is the case of many patients with class II/1. Some of them have a genetic etiology: maxillary protrustion and/or mandibular retrognathia. Others have vicious habits related to the soft oral tissues: labial incompetence, lips or tongue interpositions. Mouth breathing can also be a promoting factor. These patients have larger ANB angle than normal and they might have an open bite or a deep bite. [6]

However, the anchorage is vital to a succesful outcome of the orthodontic treatment of such clinical cases. Transpalatal arches (TPA) are used not only to reinforce the anchorage, but to also tip and rotate the molars, increasing the chances of obtaiting an occlusion close to the ideal. [7]

Aim and objectives

The primary goal of this study was to compare mesial movement of the upper first molars after orthodontic extraction with two types of anchorage methods; namely, the transpalatal arch, and molar anchorage (the 1st and 2nd molars were connected on each side of the arch with ligatures).

MATERIAL AND METHODS

The study was designed as a retrospective study. The survey was carried out in Tîrgu Mureş, Romania.

Data from a total of 16 patients (from 11 to 29 years old) with class II/1 malocclusion that was treated at the Natural Smile Dental Clinic were collected. All the subjects included required extraction of both of the first upper premolars. They were divided in two groups: 8 of them were treated using molar anchorage, the other 8 received a TPA. For each patient we did measurements on 2 casts and 2 cephatograms. One set was taken before the treatment, the other set corresponded with the end of the treatment. They had no comorbidities and were not taking any medication.

On the study casts the measurements were taken as follows:

-the first inter-molar distance (fig.1);

-the anterior dental arch length (fig.1);

-the distance between the first molars (left and right) in the sagittal plane (fig.1);

-the angle between the mesiobuccal cusp of the upper first molars, and the median (fig.2).

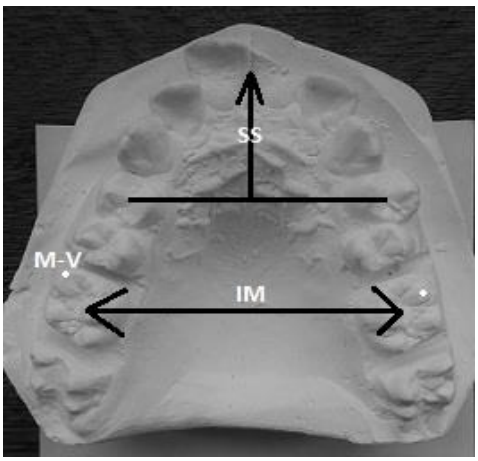

Figure 1. The measurement on the casts: IM is the first intermolar distance; SS is the anterior dental arch length; The M-V marks the mesiobuccal cusps

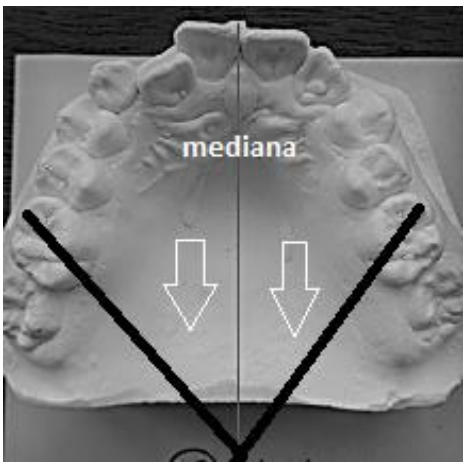

Figure 2. The arrows indicate the angles between the mesiobuccal cusp of the upper first molars, and the median

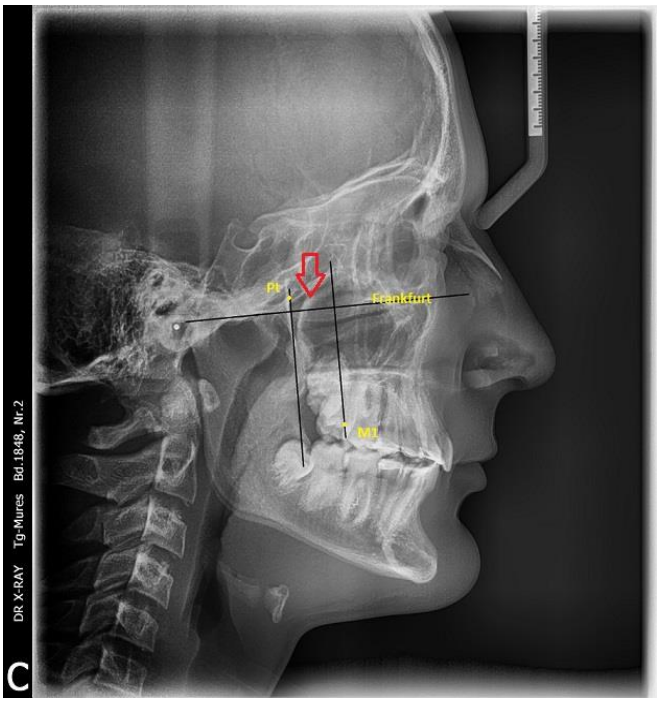

Figure 3. The red arrow shows the segment that was measured for the Ricketts analysis

The first molars' position was also determined on the patients' cephalograms using Ricketts analysis (the distance between the distal surface of the first upper molar, and a vertical line that passes through Pt- Pterygo-maxillary fissure, fig.3).

Data were entered and analyzed in Microsoft Excel 2010. Statistical analysis was conducted on the gained data. Mean and standard deviation were established. To determine the differences between the measurements in the two groups Student-T test was applied ($p \leq 0.05$).

RESULTS

The total sample of 16 patients was comprised of 6 (37.5%) males and 10 (62.5%) females. The mean age of evaluated patients was 16.8 years. Data were statistically analyzed with Student-T test and the variables are presented as mean and standard deviation (Table 1).

Table 1. Statistical analysis

The before-after difference for the following parameter:	Molar anchorage (mean+/-standard deviation)	ATP (mean+/-standard deviation)	Comparison
the first inter-molar distance	0 ± 1,414	-2,27 ± 2,939	p=0.1184
the anterior dental arch length	-3,8 ± 2,588	-1,8 ± 4,039	p=0.3173
the distance between the first molars (left and right) in the sagittal plane	1,8 ± 1,924	-0,67 ± 3,478	p=0.1526
the angle between the mesiobuccal cusp of the upper first molars, and the median-left	3,2 ± 7,981	-5,87 ± 7,8	p=0.038
the angle between the mesiobuccal cusp of the upper first molars, and the median-right	1 ± 5,385	-4,07 ± 9,331	p=0.2695

Our results show no significant differences between the parameters of the two groups, except in the angles between the mesiobuccal cusps of the upper first molars, and the medians (p=0.038). Ricketts analysis did not reveal a significant difference between the anterior movements of the first molars.

DISCUSSIONS

The results of this study confirm the efficiency of both types or anchorages, but also their resemblance. As the Table 1 shows, only for the angles between the mesiobuccal cusps of the upper first molars, and the medians (p=0.038) was a statistical difference, showing that the TPA has a higher efficiency derotating the molars.

The results are not surprising and are comparable to what others studies have shown. For example: Heather L. Zablocki studied the cephalograms of matched samples of 30 patients to see the TPA's ability to enhance orthodontic anchorage during extraction treatment. His results published in the American Journal of Orthodontics & Dentofacial Orthopedics showed that the TPA does not provide a significant effect on either the anteroposterior or the vertical position of the maxillary first molars during extraction treatment. [8]

Another study published in the European Journal of Orthodontics by Anders Dahlquist shows that the effectiveness of the TPA was significant mostly for the derotation of the first molars that were mesiopalatally rotated. [9]

A similar study to ours (in material and method) was the study of Gaetana Raucci et al. They analyzed maxillary changes in patients undergoing treatment with TPA and fixed appliances. Their material consisted of casts and cephalograms of 36 patients taken before the TPA, after the TPA, right after the fixed appliances were removed and 3 years after the fixed appliances were removed. On the cephalograms they measured the inclination of the incisors. On the casts they measured the arches' length, the intercanine distance, the interpremolar distance and the anterior dental arch length. [10]

Adel Alhadlaq et al wrote another study related to canine retraction and TPA. They did measurement on the cephalograms before and after the orthodontic treatment for 20 patients. They applied the Ricketts analysis and measured the anteroposterior movement of the first molars the same way that we did. They evaluated the movement of the distal side of

the upper first molar towards a vertical line that was perpendicular on Frankfurt's plane and hit the Pt point. [11]

Our studie's results are comparable and reinforced by the international medical literature, in spite of being a limited one, with a low number of participants.

CONCLUSIONS

- This study did not find any important statistic differences regarding the mesial movement of the upper first molars after orthodontic extraction using two types of anchorage methods: the ATP and the molar anchorages.
- The orthodontic treatments using any of the two types of anchorage are efficient in treating different malloclusions.
- The TPA might enhance the anchorage and does derotate the first molars.

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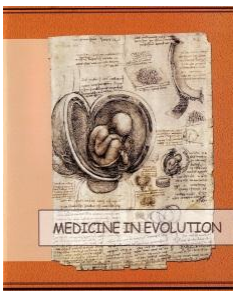
Evaluation of the treatment results of class II, division 1 malocclusions



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Abstract

AIM AND OBJECTIVES

The purpose of this study was to investigate the post-treatment results in maxillary and mandibular arches in treatment with functional appliances followed by fixed appliances, compared to only fixed orthodontic therapy.

MATERIAL AND METHODS

The sample consisted of the records of 15 patients divided into two groups, one treated only with fixed appliances, and the second group, fixed combined with functional appliances. Study casts and cephalometric radiographs were analyzed before and after treatment. Ricketts, Steiner and Wits analysis was used. The data was submitted to calculations in Excel program. Statistical analysis was done in order to determine the significant differences.

RESULTS

Statistically significant changes in SNA, ANB, I-NA, I-NB angles, overjet, overbite and in molar relationship were observed between initial and final records of both groups.

CONCLUSSIONS

Regarding the differences between the two groups, only Co-Gn has showed a significantly change. Further studies are needed in order to determine whether or not fixed appliance treatment time was decreased in the group treated with both functional and fixed appliances.

Keywords: stability, orthodontics, malloclusion.

INTRODUCTION

The importance of early treatment of class II division 1 malocclusions arises out of the existence of anteroposterior discrepancy between upper and lower dentition, which ultimately affects the quality of life of the pacient. [1]

Growing time is an adequate period to obtain succesful results, by offering the clinican the ability to influence growth changes. [2] Longitudinal studies have demonstrated that changes obtained during the active treatment period tend to relapse toward the initial malocclusion in the posttreatment years due to different factors: facial growth, initial treatment time and type of the used appliances.

The esthetic issues correlated with this anomaly can have great impact in the psychological and social aspects of the pacient's behaviour. [3]

Aim and objectives

The main objectives of this study were:

- To investigate the changes in maxillary and mandibular arches after wearing functional appliance followed by fixed appliance, opposed to fixed orthodontic therapy only.
- To compare the before and after status regarding certain indeces and perimeters correlated to canine and molar relationship.

MATERIAL AND METHODS

The study analyzed a number of 15 records of pacients with Class II division 1 malocclusion, (10 females and 5 males, aged between 9 and 18 years ol), treated in Tirgu Mureş city. The subjects adressed a private dental centre, where they were treated by a orthodontic specialist. The material consisted of 30 study casts (figure 1) (before and after treatment), 30 cephalometric radiographs (before and after), a regular compass and ruller, and the negatoscope. Each patient records consisted of study casts and radiological examinations, followed by the measurement of certain indeces and parameters.

Figure 1. Examined study casts

The patients records were divided into two groups:

Group 1: 14 study casts and 14 cephalometric radiographs of pacients treated with functional appliance followed by fixed appliance.

Group 2: 16 study casts and 16 cephalometric radiographs of pacients who underwent only fixed orthodontic therapy. Both groups were treated using a non-extractional technique.

Using Ricketts, Steiner and Wits analysis, several parameters were measured on the cephalometric radiographs (table I).

Table I. Initial and final parameters measured on the cephalometric radiographs

Initial and Final Parameters	SNA	i.NA (° şi mm)
	A-N.perp.	i.pl.bisp.
	Co-A	i.NB (° şi mm)
	SNB	IMPA
	Pg-N.perp	SNGo.Gn
	CO-Gn	FMA
	ANB	Overjet
	AoBo	Overbite
	Molar status	

The following indeces were measured on the study casts:

- Upper anterior perimetry
- Lower anterior perimetry
- Upper intermolar distance
- Lower intermolar distance
- Upper intercanine distance
- Lower intercanine distance
- Irregularity index - IRI (Little)

Data was brought together using Excel program and then was submitted to statistical analysis using Student 'T' Test.

RESULTS

Results revealed the fact that SNA and ANB angles had almost identical values in the two examined groups, group 1 showed higher values regarding SNB angle and CO-A and CO-Gn distances, compared to group 2, while group 2 showed important values of SN-GO.Gn angle and FMA angle. The value of the overjet was similar in the two groups (figure 2).

Figure 2. Comparison between indeces on cephalometric radiographs

Group 2 showed higher values regarding lower anterior perimetry, lower intercanine distance and the Irregularity index (figure 3).

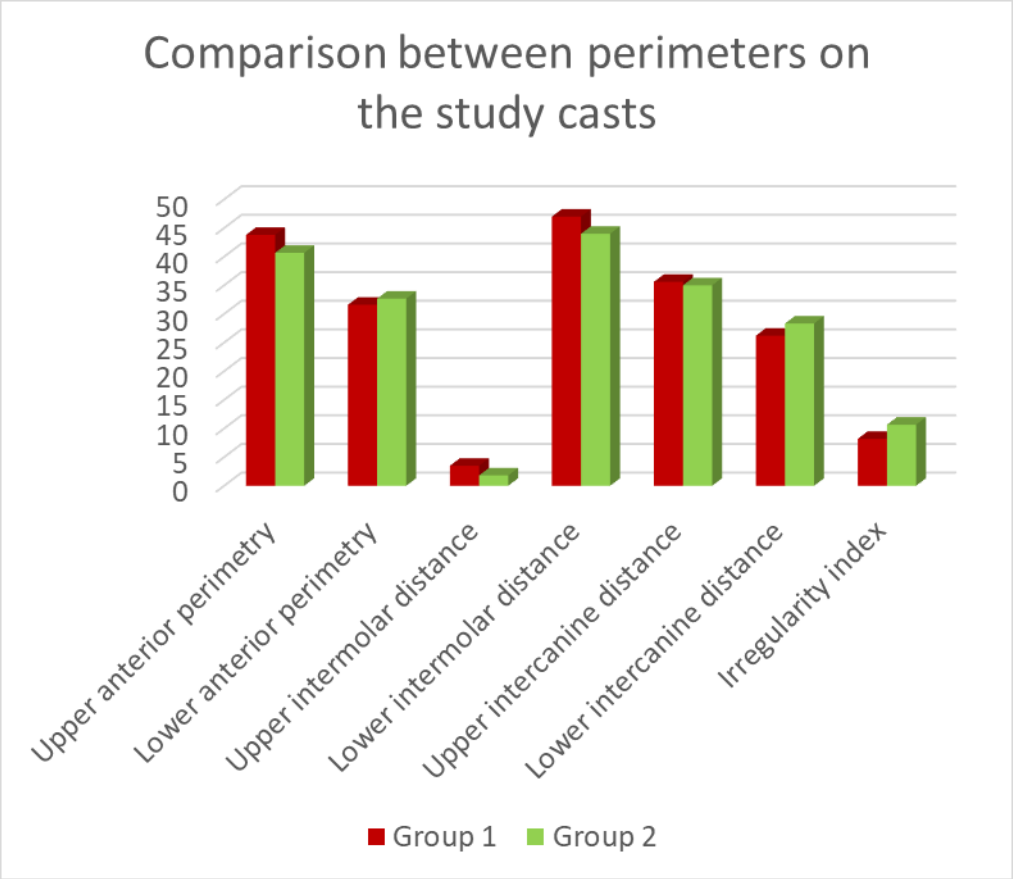

Figure 3. Comparison between perimeters on the study casts

Applied to our study and knowing that the value of "p" is significant only if it is less than 0.05, it can be observed that only Co-Gn distance showed relevance, expressed by p=0.0294 (table II).

Table II. Comparison between the two groups

		SNA°	SNB°	ANB°	A-N.perp (mm)	Pg-N.perp (mm)	Co.A (mm)	Co.Gn (mm)	S.GoGn°
Group 1	Mean	81	79.2	3	1.667	6.25	86.8	110.6	30,8
	mean ± standard deviation	81 ± 3,317	79,2 ± 5,762	3 ± 1,225	1,67 ± 0,577	6,25 ± 2,217	86,8 ± 3,701	110,6 ± 2,302	30,8 ± 5,891
Group 2	Mean	81	78	3	5.6	12,167	81.5	106,83	33.83
	mean ± standard deviation	81 ± 3,899	78 ± 4,05	3 ± 1,095	5,6 ± 5,03	12,17 ± 8,519	81,5 ± 5,32	106,83 ± 2,483	33,83 ± 12,303
P =		1	0.6945	1	0.239	0.2189	0.0937	0.0294	0.7441

DISCUSSIONS

On the basis of these findings and within the limitations of our study it could be concluded that the wearing of functional appliance (e.g. activator) before fixed orthodontic therapy does not influence the treatment outcomes in a significant way, except the fact that

the difference between the two groups regarding Co-Gn distance shows a mandibular groth stimulated by activators. Some authors [8] stated that activators are most effective only in a mild-to-moderate Class II skeletal discrepancy and they should be used on growing patients in order to avoid potential trauma due to the proclination of upper incisiors.

Proclined upper incisors and labial incompetence between 9-12 years old are treated with Andresen functional appliance, although most of the orthodontists choose to finish the treatment using fixed therapy [10-11].

Fixed appliances alone are successfully used in order to gain Class I molar and canine relationships, they could not influence the growth of the maxilla and mandible [6-9].

Based on the data found in other specialized literature studies, fixed therapies only are as effective as functional followed by fixed appliance and they have a few more advantages: require less time and less costs, their wearing doesn't depend on the child's compliance [5]

Our study is in accordance with Nanda s [7] findings: differences that appeared after one-phase treatment disappeared when both groups received fixed appliance treatment. [7]

CONCLUSIONS

Following our study, we could establish the fact that only Co-Gn distance showed siginificant difference whithin the two groups.

A drawback of our study is the reduced number of examined cases. Further studies are to be conducted based on an increased patient lot.

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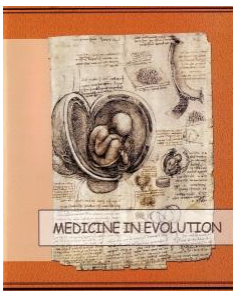
The level of knowledge of rural dentists regarding bisphosphonate therapy



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Abstract

The aims of the following study were to evaluate how the anamnesis is performed in rural dental practice cabinets in the counties of Caras Severin and Timis, the collaboration between dentists and primary care physicians and to assess the level of knowledge regarding the approach of patients undergoing bisphosphonate therapy. To reach our goal, we submitted a questionnaire to 130 dentists from rural areas in the counties of Timis and Caras-Severin, Romania. The questionnaire was structured to obtain data on how anamnesis is performed in the dental office, on the level of dental practitioners' knowledge on dental effects of bisphosphonate therapy, on the trademark names of bisphosphonates and on the management of bisphosphonate therapy. One of the most important roles in the approach of a dentistry patient is the implementation of a detailed and correct anamnesis, in order to gather all the information regarding the patient's medical history before the initiation of bisphosphonate treatment. In addition, the anamnesis should be performed through the whole treatment period.

Keywords: Dentists, Anamnesis, Bisphosphonates, Level of knowledge.

INTRODUCTION

Recently, bisphosphonates have become one of the most used drugs prescribed in the treatment of osteoporosis, oncological diseases, as well as Paget's disease. Osteonecrosis of the jaw has emerged over the last 10 years as an adverse effect of amino-bisphosphonates. In 2003, Marx reported the first cases of osteonecrosis of the jaw associated with bisphosphonates (1). Afterwards, the number of cases with jaw osteonecrosis caused by oral or intravenous bisphosphonate treatment has increased. (2)

Bisphosphonates are synthetic compounds of pyrophosphate (a bone turnover regulator) containing in their molecule the P-C-P structure with 2 carbon-linked side chains, R 1 and R 2. Chain R1 is represented by the hydroxyl or amino group and has an increased affinity for calcium. The R2 chain gives bisphosphonates an antiresorptive potency which increases by elongation with an amino group. (3)

Oral surgery procedures are considered the major risk factor for jaw osteonecrosis. Of these, dental extraction is the most common cause, 52-61% of patients whom have undergone dental extractions have been diagnosed with jaw osteonecrosis. Also, periodontal diseases and the use of incorrectly adapted dental denture are well known local risk factors for jaw osteonecrosis.(4)

Bisphosphonates linked risk factors are the bisphosphonate type, the duration of treatment, the method of administration (2,5). In order to prevent adverse effects determined by bisphosphonates, patients should be carefully evaluated before treatment initiation. (6) Therefore, dentists are required to know the classes of BSF drugs and their side effects in order to obtain an improved therapy management.(7) The aim of the study was to evaluate the level of knowledge of rural dentists over the attitude adopted towards patients undergoing treatment with BSF.

MATERIALS AND METHODS

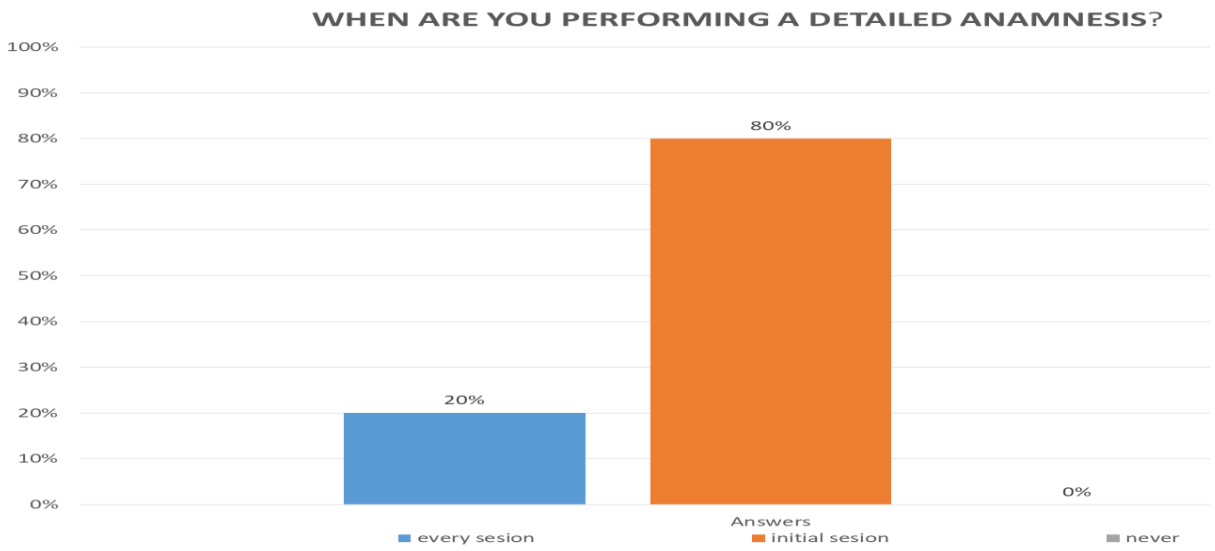
A transversal study was carried out on a group of 130 dentists from rural areas from the counties of Timis and Caras Severin, Romania. They were distributed at a conference with a 98% response rate from all participants in the training.

The method of data gathering was done through a questionnaire that was structured in 2 large parts. The first part addressed the manner in which the dentists performed the anamnesis and their collaboration with the primary care physician. The second part of the questionnaire assessed the dentist’s level of knowledge and the medical approach used regarding bisphosphonate therapy. The questionnaire contains explicit multiple choice questions. The questionnaire was distributed by a single person and the participants were not allowed to consult any sources of information.

RESULTS AND DISCUSSIONS

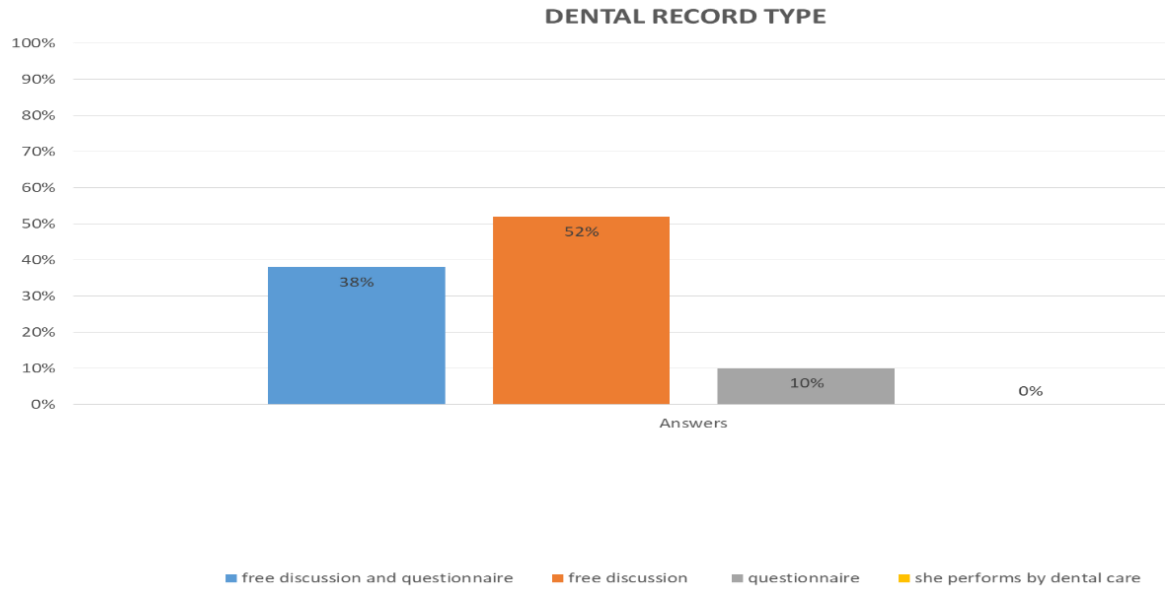
The first part of the questionnaire assessed the anamnesis (frequency, the person who performs it, if it is either written or oral, the amount of details and its use during the treatment period).

80% of the patients whom had an appointment only had an initial session, which could lead to the loss of information during periodic treatments, and only 20% of the patients had their anamnesis repeated at the beginning of each treatment session.

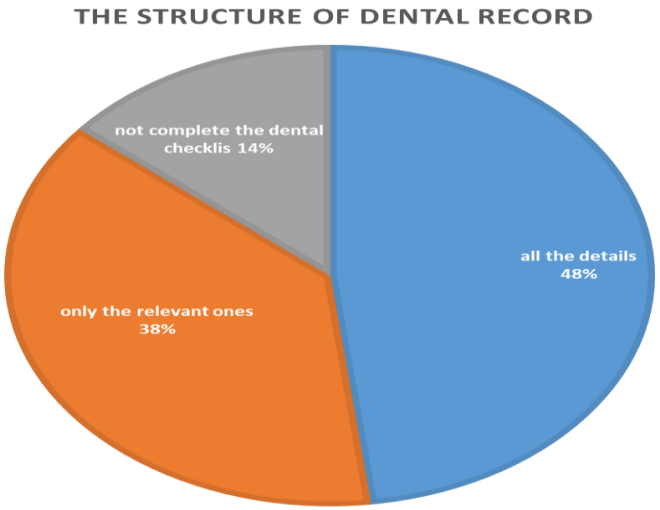


38% of the dentists performed anamnesis both as a free discussion with the patient and a through a questionnaire, 52% through a free discussion, and only 10% through a questionnaire.

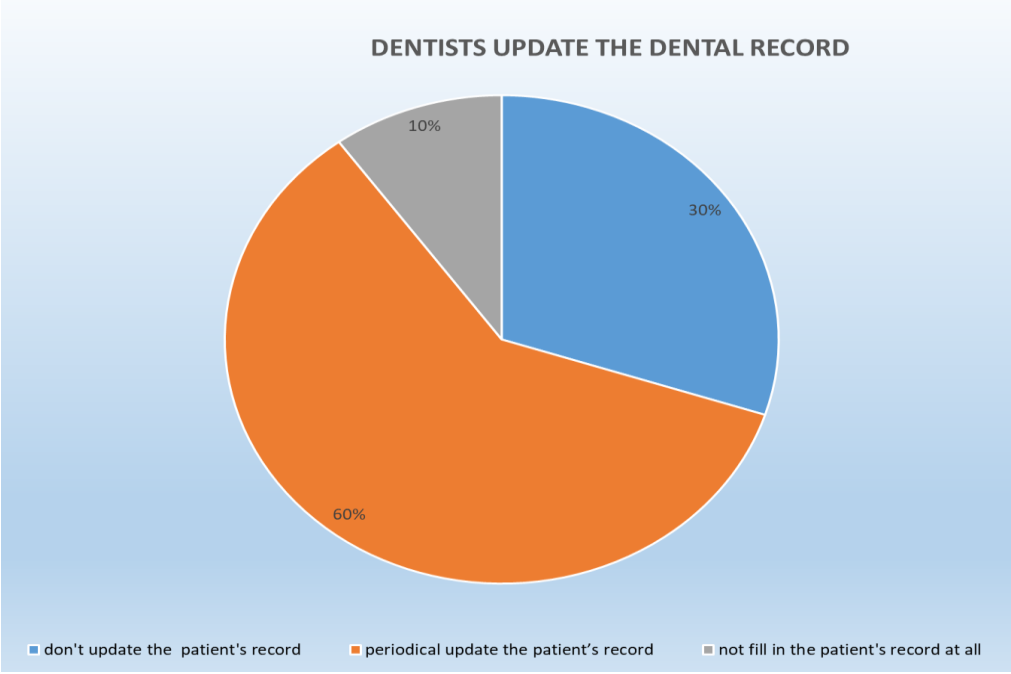
In Romania, a national questionnaire was implemented to assess the health status, which has led to attention being paid to the effects of bisphosphonates in the dental system, the knowledge of commercial names and the importance of the dose and how they are administered. Thus, we can say that access to international literature has led to the introduction of new data on bisphosphonate therapy.



48% of the dentists recorded all the details, while 38% recorded only the relevant ones and 14% did not complete the dental checklist. Failure to complete dental records and lack of details may lead to the loss of valuable information, providing a wrongful approach of the therapeutic plan and causing undesirable complications.



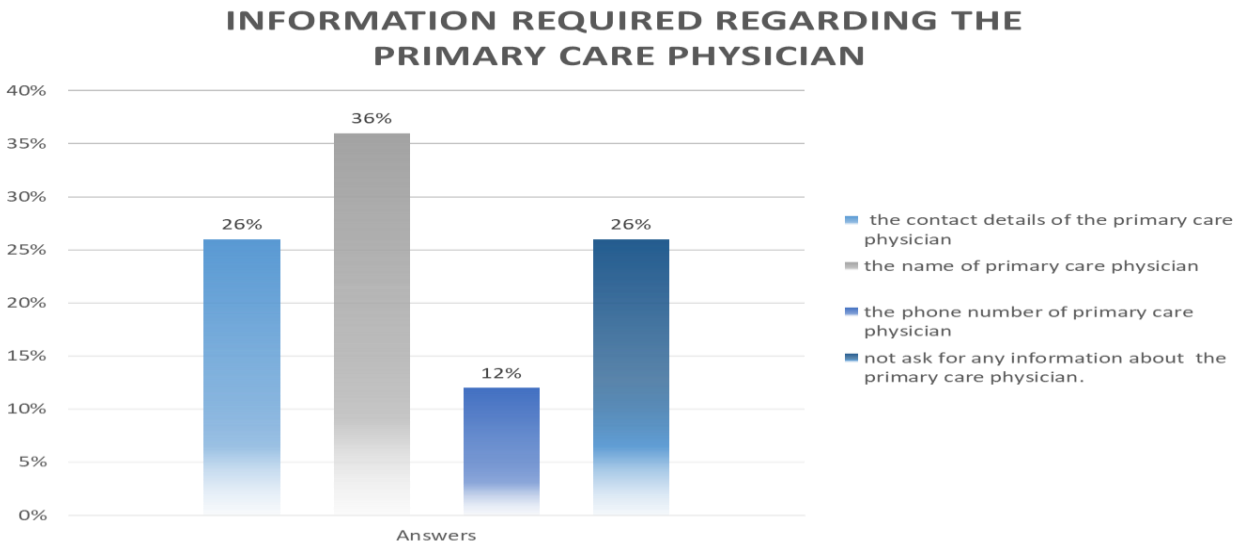
The importance and necessity of anamnesis should not be diminished. Most dental practitioners periodically update the patient's record (60%), while 30% did not update it, and 10% did not fill in the patient's record at all.



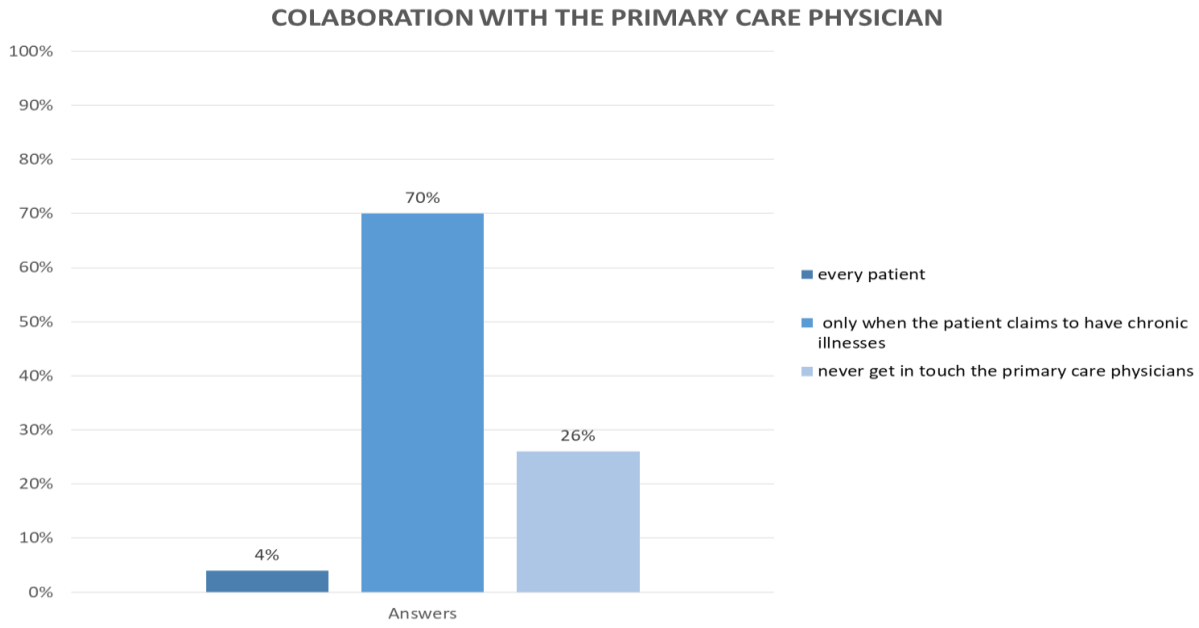
Interdisciplinarity is compulsory in order to provide an appropriate treatment.

The collaboration between the dentist and the primary care physician should be constant, the latter can be an important provider of important information regarding the patient's clinical condition.

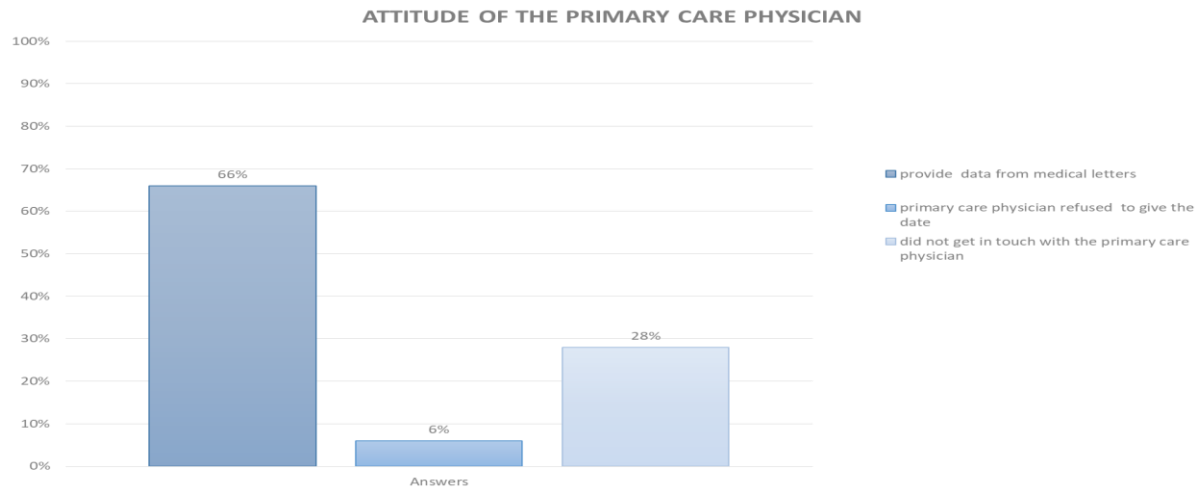
Thus, 26% of the participants ask for the contact details of the primary care physician, 36% only ask for their name, 12% only ask for the phone number and 26% do not ask for any information regarding the primary care physician.



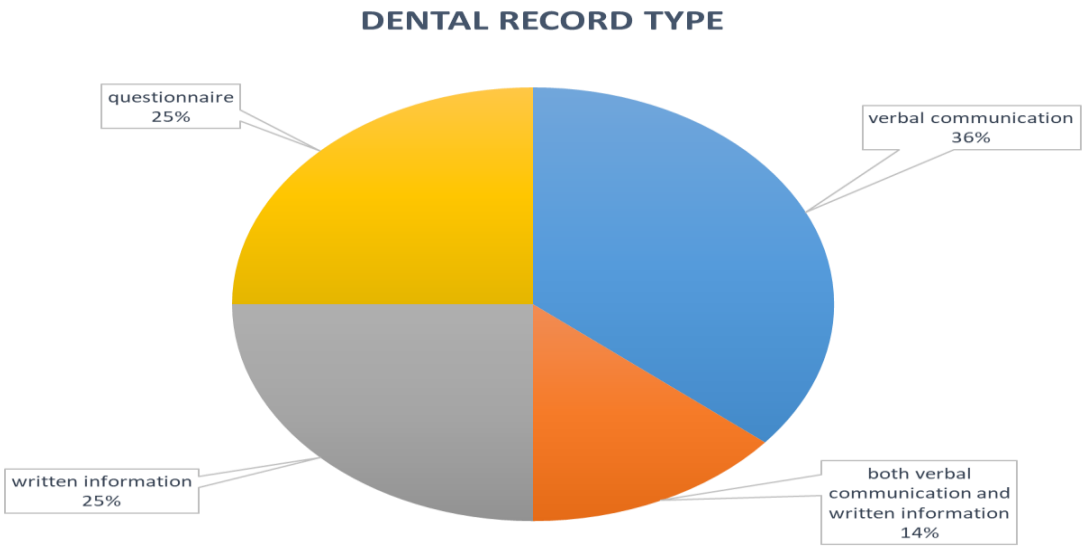
70% of the dentists got in touch with primary care physicians. When the patient claims to have chronic illnesses only 4% get in touch with the primary care physicians for every patient and 26% never got in touch the primary care physicians.



In most cases, the collaboration between the dentist and the patient's primary care physician is maintained by providing data from medical letters. Only 6% of the participants had failed to obtain the patient's medical history, and 14% did not get in touch with the primary care physician.



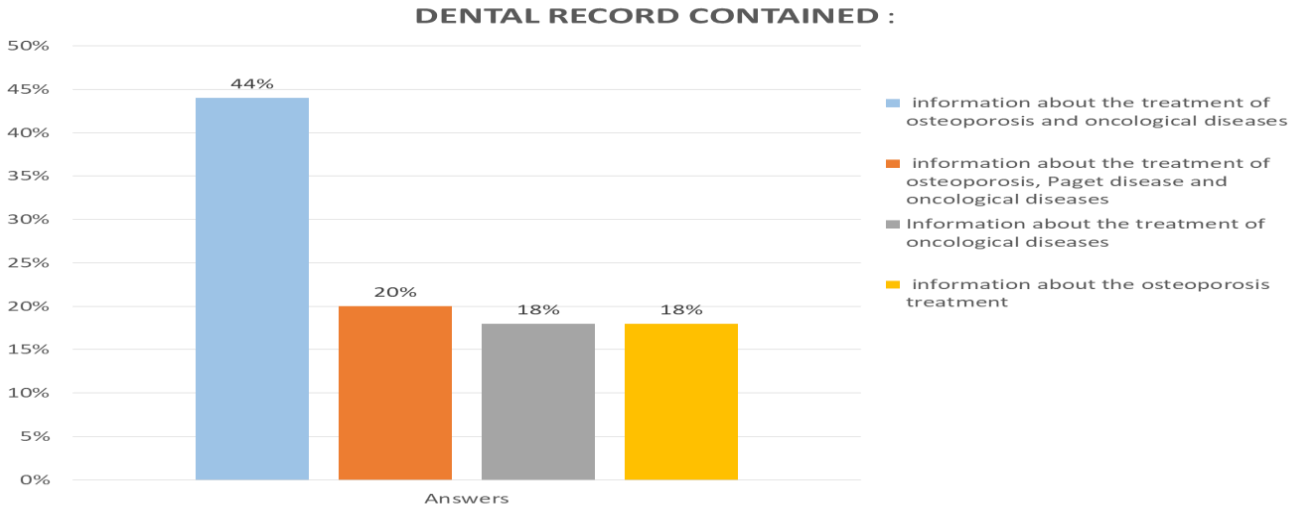
The patient is asked for information regarding the contact details of the primary care physician, in order to obtain valuable medical information regarding the patient's medical history. However, some of the inquired participants did not contact the primary care physician, a situation which inevitably leads to an alteration of the medical act.



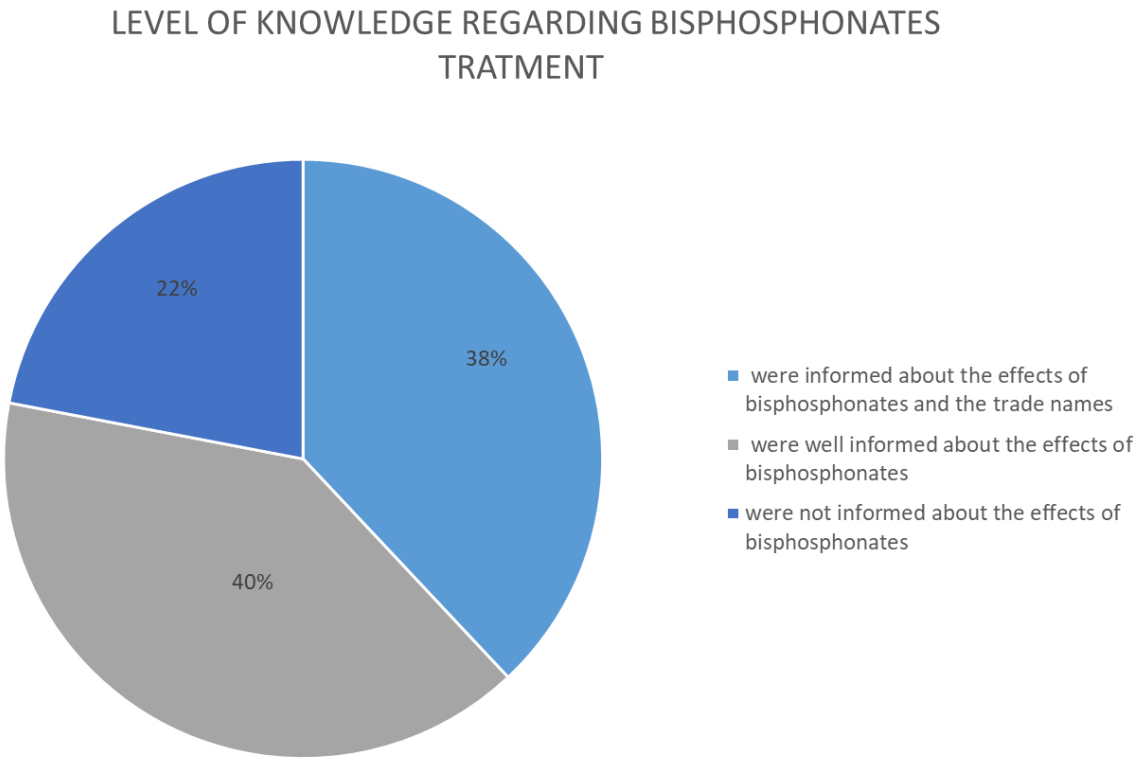
36% of the participants performed the anamnesis only by verbal communication, 14% through both verbal communication and written information, 25% of them actually interviewed the patient through a questionnaire and 25% by written information.

Although the correlation between bisphosphonate therapy and jaw osteonecrosis has recently been discovered, the gravity of complications leads to the need for a complete knowledge regarding the implications of this treatment plan. (8)

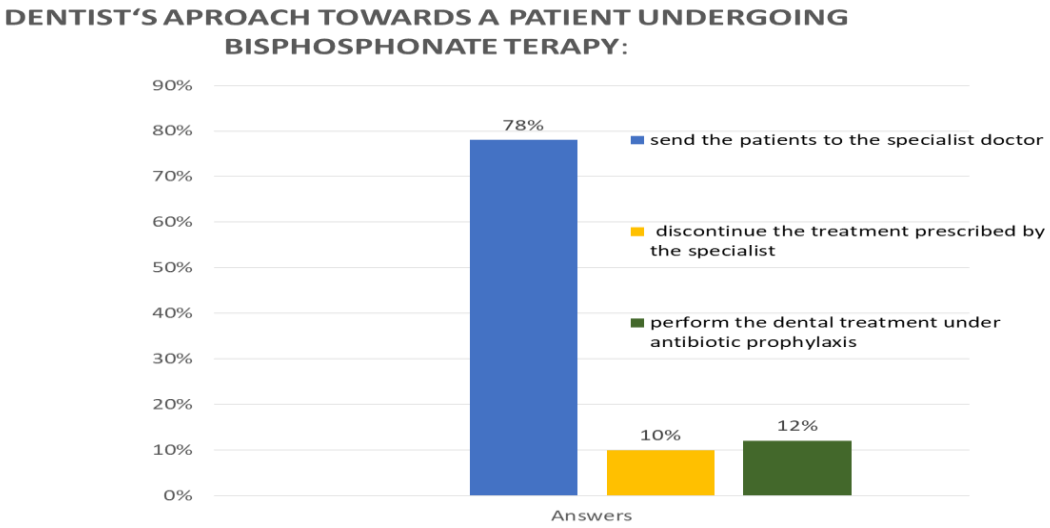
Regarding the data on patients' general medication, 44% of the participants ask for information about the treatment of osteoporosis and oncological diseases, 20% ask for information regarding the treatment of osteoporosis, Paget's disease and oncological diseases, 18% inquire about the treatment of oncological diseases and 18% inquire for osteoporosis treatment. All of these diseases may contain bisphosphonates in the therapeutic regimen.



The study revealed that the knowledge of dentists in the rural area is quite high, 38%, of the participants are well informed about the effects of bisphosphonates, the trade names, while 40% of the participants have been informed about the effects of bisphosphonates, however they fail to recognize their trade names, and 22% were unaware of the bisphosphonate adverse effects.



After the patient informs the dentist that he is under bisphosphonate treatment, most participants send the patients to the specialist doctor, 14% of the participants discontinue the treatment prescribed by the specialist and 12% perform the dental treatment under antibiotic prophylaxis.



CONCLUSIONS

One of the most important roles in the approach of a dentistry patient is the implementation of a detailed and correct anamnesis, in order to gather all the information regarding the patient's medical history before the initiation of bisphosphonate treatment. In addition, the anamnesis should be performed through the whole treatment period.

In this study, most dentists know how to recognize the medical indications of bisphosphonates, which did not explain the increased number of secondary maxillary osteonecrosis due to bisphosphonate therapy.

Despite the fact that the literature is abundant in information regarding bisphosphonates and their adverse effects, there are dentists who do not know the effects of these drugs.

In addition to ignoring the patient's bisphosphonate treatment, dentists apply dental maneuvers, which can inevitably lead to a deterioration of the patient's clinical condition.

Dental medicine does not deal with the health of the teeth but also with a good state of the dental system.

In conclusion, it is important that each dentist should perform a detailed anamnesis and to be aware of the medical management of patients undergoing bisphosphonate treatment. Therefore all physicians must be trained on how to approach patients undergoing bisphosphonate treatment.

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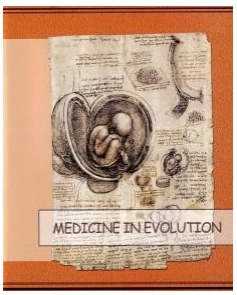
Chromatic attributes of aesthetic area teeth



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Abstract

Introduction: Qualitative assessment of geometric and chromatic landmarks of patients' dento-facial structures and identification of all inappropriate aspects is the primary stage from which any treatment should begin, the ultimate goal of which is the aesthetic rehabilitation of the smile.

Case report: A 20 year old patient presented with a fracture at the mesial angle of the upper central incisor. In order to rehabilitate disharmonies, the direct technique of restoration with the silicone key was applied.

Conclusions:: In dental-facial aesthetics, as in any other medical specialty, in order to establish an appropriate treatment plan, the physician must take into account both the subjective and the objective aspects of the "disease."

Keywords: silicon key technique, disharmony, aesthetic.

INTRODUCTION

Color, although a self standing entity, needs to be looked at as a piece in a puzzle, that in order to be built needs a lot of other pieces. Color represents just one of the many attributes of aesthetic dentistry, adding the geometric attributes of the smile aesthetic (1)

When we talk about tooth color, it needs to be defined in terms of shades, saturation and brightness, also it is paramount we also mention the other optical characteristics of the tooth surfaces: opalescence, florescence, and translucency (2)

In 1931, Clark, using the Munsell system of organizing color, published the first study over color of natural teeth; the values measured by Clark for the 3 parameters of color were: shades between 6YR and 9,3Y, saturation between 0 and 7 and brightness between 4 and 8. Referencing the three characteristics of color described by Munsell, we need to make a few specifications. The shade of teeth is determined primarily by the dentin. In the case of vital, healthy teeth, shade is situated somewhere in the yellow color spectrum (from yellow-yellow to red –yellow) (3)

If we refer to the classic standard Vitapan color key, the shade of teeth is predominately included in the category A, with a small procentage in the category B. the color saturation is dictated also by the dentin, but it is influenced by the translucency and thickness of the enamel. The thicker the enamel layer is the lower the saturation level of the tooth is giving the impression of a diffuse saturation. (4) in the cervical region of the crown where the layer of the enamel is thinner. The color of the tooth is characterized by a dens saturation. The brightness of teeth is determined in principal by quality and thickness of the enamel, in the areas with a thick enamel, the optical effects are characterized by high brightness levels.

The fluorescence of teeth is the consequence of impressing the pigments at the dentin level and of the enamel- dentin junction, by the ultraviolet radiation of the incident light, resulting in a bright with or blue light emission. (5) clinically this is translated by the appearance on the surface of the tooth of an area of white or blue iridescence.

The opalescent (white/milky) aspect of teeth is due to the different refraction indices, of the organic and inorganic components of the enamel, but mostly hydroxyapatite crystal properties of dispersing the incident light. (6)

Translucidities' and opalescence of tough dental structures are two parameters that are difficult to explain and quantify in the dental office. Translucently represents one of the main landmarks in the aesthetic of dental restorations, by means of which, some may pass as natural, while others may look artificial. (7)

CASE REPORT

A patient came in with a dental shape disharmony generated by an incisor angle fracture, mesial on the 11 central tooth. Young adult 20 years old.(figure 1) for an aesthetic rehabilitation we applied a direct restoration using the silicon key technique, and also using Filtek Supreme XT (3M ESPE) composite resin.

We used the silicone key, to define the contour of the future restauration,because such restorations of an incisor angle fracture on a front tooth are procedures that require a lot of attention and detail in order to obtain a correct and functional and symmetrical incisor line.

In order to obtain this silicon key, in the first step, we made a temporary composite resin –mock up- restoration, following a perfect marginal, palatal, proximal and functional adaptation. Afterwards we took an impression in silicone putty (figure 2) in order for it to contain the palatal faces and incisor lines of the temporary restored tooth and the neighboring teeth. (in order to obtain a good stability of the material after its hardening)

After removing the mock-up, we prepare the tooth, (beveling the margins of the enamel and realizing the adhesive sub layer) the impression is repositioned at the same level and it works as a confirmatory, for rebuilding the final restoration. This technique reduces a lot of the finishing maneuvers, especially incisory and palatal. (figure 3) The chromatic initial analysis has shown the uniformity in color and opacity at the entire level of the vestibular surface, we applied identical layers of shades(A2), but of different opacity: A2B palatine, A2E vestibular. After finishing the retouching and finishing maneuvers, (figure 4) we can whiteness the morphological and chromatic symmetry of the two superior incisors.

Figure 1. Dental shape disharmony generated by an incisor angle fracture, mesial on the 11 central tooth- joung adult 20 years old

Figure 2. Silicon key technique

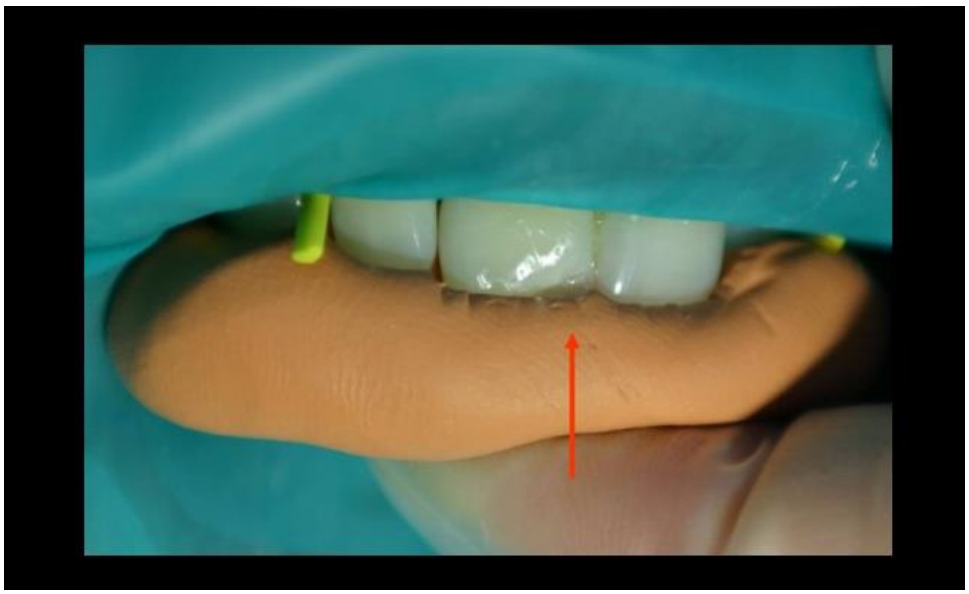

Figure 3. The resin stratification by appling identical layers of shades (A2) but different opacity

Figure 4. Final aspect of the restauration

DISCUSSIONS

Experimental studies done on the topic of chromatic stability of composite resins, have demonstrated the fact that after polymerization, the color can suffer changes. The resin becomes, most commonly, darker and less saturated. Exceptions are the shades of micro charged composites used for bleached teeth, those become more luminous.(8) Because of this, sometimes, for a more accurate match, to determine the color by means of applying a bit of the resin on the surface of the tooth that needs to be restored. As time passes, composite resins, suffer an aging process, followed by a modification of the color; the main causes are ; degrading of main free radicals in the structure of the material, penetration of coloring sources in food and beverages, mouth washes, nicotine stains, retention of plaque on rough surfaces et (9) Old restorations become, usually, darker and saturated, and the micro infiltrations, and the secondary marginal cavity determine the appearance of a brownish color in the interface tooth/restoration generating anesthetic aspects.

CONCLUSIONS

Clinically, composite resins are translucent materials; their degree of translucency depends on the optic behavior (the absorption degree and dispersion of light radiation) of the components included in the composition of the materials, during the technological process of the fabrication (filling particles, pigments, opaque's). On the other hand, the optical properties of composite materials, depend on the thickness of the material layer, the color of the surface it covers, and the wave length of incident light. Because the absorption coefficient of the light differs from one shade of composite material to the next (bigger for grey shades, smaller for universal shades and luminous ones.) and by photopolimerizations, the color of the material, may suffer modifications, the production companies are obliged to give notice regarding the level of translucency of the shades in the composite raisin kits (low, medium or high translucency).

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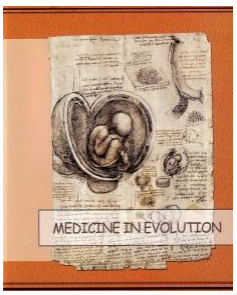
Prevalence of double crown removable partial dentures. Short report



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Abstract

Aim and objective: To determine the prevalence of removable partial dentures on telescopic crowns in adult and senior population.

Material and method: 397 patients aged between 35 and 87 years were treated by using removable partial dentures. The removable partial dentures on double crowns and the distribution of the double crown retainer type were counted: conical double crowns, resilient double crowns or galvanoformed double crowns. The overall satisfaction of the patients was measured on a scale from 1 to 5.

Results and discussions: From the treated cases (n =397), the removable dentures on telescopic crowns where 19,85%. Only 2% from these double crown retainers were galvanoformed, 15% were resilient and 93%the conical. The overall satisfaction was 4 (32,4%) and 5 in most of the treated cases (67,6%).

Conclusions: The removable dentures on telescopic crowns are still viable solutions in extended edentulous arches treatment, in middle age and senior patients.

Keywords: double crowns, removable partial dentures, galvanoformed double crowns.

INTRODUCTION

Removable dental prostheses, given suitable pretreatment and follow-up regimes, can provide satisfactory solutions [1, 4, 7, 8]. Longitudinal follow-up studies of 5 to 10 years report that conical crown-retained partial dentures have a lower failure rate compared to those retained with clasps or precision attachments. Double crown-retained or telescopic prostheses have been successfully used in partially edentulous patients. This type of retainer provides guidance, support, and protection from dislodging movement, and it transfers bite forces physiological, along the long axis of the abutment teeth. Furthermore, the denture can easily be retrieved when an abutment needs to be extracted [1]. Both clinical and statistical data indicated the superiority of the restorations made with electroplated secondary crowns and metal framework [6]. The treatment is, therefore, a promising therapeutic option. In Romania the removable partial dentures retained on double crowns are used in patients with general health problems with few teeth or in patients who cannot afford implant supported fixed partial dentures.

Aim and objectives

Aim and objectives of this study were to calculate the rate of the double crown retained RPDs comparative to other RPD types and the patient overall satisfaction.

MATERIALS AND METHODS

This study was realized in the Department of Prosthodontics, Faculty of Dentistry, University of Medicine and Pharmacy "V Babes" Timisoara, Romania. Telescopic RPD were counted from the total RPD inserted. 397patiens aged between 35 and 87 years, treated in the clinic and wearing RPDS were examined between 2012-2017. The distribution of each type of telescopic- electroplated secondary crowns retained RPD and resilient double crowns retained RPD related to all the double crown retained RPD was registered. Each treated patient has signed and informed consent in accordance with the Ethical Comity of the University. The inclusion criteria for the patients in this study was: the patient had at least one RPD with metal framework and had to respond positive at one year recalls after the RPD insertion in the mouth. The overall satisfaction with the double crowns RPDs was registered by using a scale from 1 to 5 (1 – no satisfaction, 2 – acceptable, 3- functional, 4- functionality and comfort, 5- improved oral health-related quality of life. The appeared problems were registered and treated.

RESULTS AND DISCUSSIONS

The ratio telescopic RPD 16% versus RPD 84% with metal framework is presented in Fig.1.

The ratio galvanoformed RPD (2%) versus resilient RPD (5%) versus other telescopic dentures 93% is presented in Fig.2.

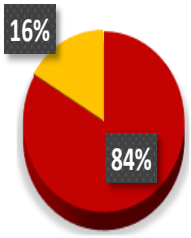

Figure 1. Telescopic RPDs (16%) RPDs (84%)

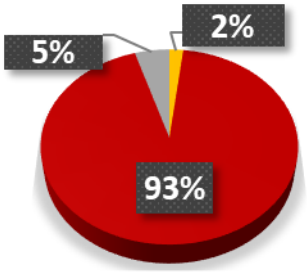

Figure 2. Galvanoformed double crown retained RPDs (2%) versus resilient telescopic dentures (5%) versus conical telescopic dentures (93 %)

Even the galvanoformed secondary crowns are not very used (2%), due to their high price, the retention on the abutment teeth is very smooth and forces exerted on insertion and removal of the prosthesis are not harmful Fig.3. The satisfaction of the patients with this type of RPD is high (5) and there were no complications. The patients included in this study reported an overall satisfaction of 4 (32,4%) and of 5 (67,6%) in most of the cases treated with double crown retained RPDs. The most common accident after the end of the treatment was the debond of the primary crowns (12), but this could be easily solved.

An interesting research [2] find out that the individual telescopic abutment survival rate over a 60-month period was 80.6%. This observation was significantly influenced by sex and tooth vitality and mobility. The risk of loss of telescopic crowns was significantly influenced also by the tooth distribution on the dental arch. It was mentioned also that telescopic removable partial dentures were proven to be a favorable treatment concept for severely reduced dentitions in selected cases and that is in accordance with the results of this study.

Figure 3. Galvanoformed secondary crowns in a patient treated by using a double crown retained RPD: **a**. panoramic X-ray; **b.** primary crowns; **c**. secondary galvanoformed crowns; **d**. cast metal framework; **e, f.** final aspect of the RPD in the mouth

The medium-term double-crown-retained removable dental prosthesis survival appears acceptable. This kind of prosthesis might be a viable treatment option for patients with a reduced dentition [5].

Treatment with different double crown-retained RPDs improved oral health-related quality of life [3]. It was also shown that treatment with electroplated removable partial dentures (RPDs) and cast RPDs improved oral health-related quality-of-life initially. Over a period of 36 months the effect was significant. The cast conical design seems to have advantages with regard to long-term oral health-related quality-of-life [6]. In this study was also obtained the improvement of the oral health-related quality-of-life for 5 years.

CONCLUSIONS

The double crown retained removable partial dentures are viable treatment in well selected cases with few teeth on the arch. However, more clinical research is necessary to confirm the present in vivo results in larger patient groups.

Acknowledgements

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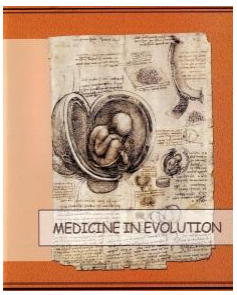
Histologic preparation of un-decalcified hard oral tissue: classic and modern methods vs. imagistic sample analysis



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Abstract

Bone physiology has been better understood in the 1950s, with the development of plastic-embedding techniques for microscopic examination of the un-decalcified sections of bone tissue.[1] In the past, bone histology required removal of its most important component, the mineral. New technologies were refined since then. This review presents classic and new methods in preparing un-decalcified bone tissue samples, especially bone-implant samples. Some practical recommendations on the histological processing of un-decalcified bone samples are presented, as well as up-to-date cutting/grinding equipments, fixation methods, embedding materials and staining techniques. Data relating to information processing using special histological techniques in comparison to micro-computed tomography are provided.

Keywords: dental implants, osseointegration, histologic techniques, microCT, histomorphometry

INTRODUCTION

The use of un-decalcified bone-implant samples allows the differentiation of immature from mature bone tissue, as well as the quantification of variables, such as the bone-implant interface (BIC, %), mineralization (%), percentages of new bone area (NB, %) and total bone area (TB) on the threads. Results from the histomorphometric measurements on the soft tissue can be also included: the distance between the margin of peri-implant mucosa (PM) to the marginal bone crest (BC) or to the most coronal point/peak of contact between bone and implant (B/I). These are some of the measurements that can be made on ground sections on this type of samples.

Originating from the processing of samples of metallic alloys for metallographic analysis, the cutting-grinding technique of histologic samples, first described by Donath and Breuner (1982)[2], using the EXAKT cutting-grinding system (EXAKT Vertriebs, Norderstedt, Germany) and glycol-methacrylate (GMA) as an embedding medium, uses today methylmetacrylate (MMA), and, more recently, epoxy resins.[3]

Up to date, there is no consensus in the literature on the effectiveness of these methods of analysis of non-demineralized implant-bone-oral soft tissues samples, which made the selection of the one with the highest histologic relevance, cost-effectiveness and shortest duration difficult.

The present paper reviews various methods of processing un-decalcified hard and soft oral tissues including metallic dental implants for histologic analysis.

SEARCHING METHODOLOGY

Electronic searches for articles dating back as far as 2005 were performed in the PubMed, Elsevier ScienceDirect and Wiley Online databases for relevant publications until December 2017. The studies were included if they met the following criteria: complete explanation of the process of harvesting, fixation and preparation of the specimen, embedding, cutting and grinding, staining, reading of the histomorphometric and μCT results. From 150 studies found, 3 met the above inclusion criteria.

Harvesting, fixation and preparation of the specimens

When a tissue sample is harvested for histologic analysis, the use of a good fixative solution to stop autolysis (the dissolution of cells by intracellular enzymatic digestion) and putrefaction (the breakdown of tissue by bacterial action) by inactivating the enzymes, bacteria and molds that begin to form immediately after death is mandatory. It also protects the tissue from excessive shrinkage and volume modification, thus it will not disolve or distort. The fixative solution must protect the tissue during the embedding process (the impregnation of the polymer at a high temperature), and from the mechanical damage during sectioning. Furthermore, for the fixation of the specimens, a specific solution is used; for example, buffered formalin contains salts that can precipitate on the tissue surface during drying. This is not a problem for the usual histology specimen, but when chemical or scanning electron microscopic analysis is performed, this should be recognized as an artifact. Other fixatives, for example glutaraldehyde or paraformaldehyde, can be useful for electron microscopy or for histochemistry, but these fixatives do not penetrate tissue as good as formalin and, subsequently, are not as useful for most routine histology. As an alternative to formalin, tissues can be fixed in 70% ethanol, if the specimen has received intravital fluorochrome labeling. [4]

Specimens of implants and surrounding tissues are usually obtained from living individuals using a trephine bur. Each bone sample containing the implants, hard and soft tissues is block-sectioned and immersed in a fixative solution of 4% formalin or buffered

formalin for 1 week. [5] Then the samples are dehydrated in a series of increasing concentrations of ethanol, using a dehydration system with agitation and a vacuum. [6] Chemical fixation may be enhanced by the use of physical fixation, such as heat and vacuum. Heat is used to precipitate proteins, accelerate fixation, but not as a stand-alone method. Dehydratation uses increasing concentrations of ethanol, from 70% to 99% during 15 days. [2] 70% ethanol is generally accepted as the „golden standard fixative" for long-term storage of bone [7], but this does not mean that the original specimen should be primarily fixed in this solution. Bone should be adequately fixed in 10% neutral buffered formalin or alternate fixative and then stored in 70% ethanol. This is used to eliminate the effects of decalcification, which can sometimes occur during long-term storage in formalin-based solutions. Concentrations of fixatives are also important, as they will be determined by the cost, solubility and necessity. As an example, a formalin concetration over 10% causes unnecessary hardening, while ethanol concentration bellow 70% does not dehydrate enough. Fixatives, such as ethanol, methanol and acetone, remove the free water from tissues, leading to the precipitation and coagulation of the proteins. [8] For example, Blanco et al. (2013) fixated the samples in 10% formalin for 1 week, while Erdogan et al. (2013) used 10% buffered formalin, and Calvo-Guirado et al. (2015) used 4% formalin. [9,10]

In general, the most used fixative is 10% neutral buffered formalin, that preserves mucopolysaccharides, but in the absence of a buffer it will form a "formalin pigment" artifact which is not suitable for certain stains. Also, 10% alcoholic formalin cuts fixation time in half and preserves glycogen, but dissolves fat and lipids and does not preserve iron-bearing pigments. For long-term storage, it is important to place the tissue in 70% ethanol. Acetone at -4˚C is used for fluorescent antibody techniques and for preservation of enzymes, especially phosphatases and lipases, however, some shrinkage and distortion may occur. [11]

Embedding

Embedding techniques appeared in the mid 1800s in response to the improvements of microscopy observations in light microscopy. As the resolution of microscopes increased, so did the need for improved quality of the tissue specimens to be analised, and, since then, embedding techniques using waxes and resins have been developed and perfected for different specific aims and types of specimens. Paraffin is most suitable for embedding soft tissues and decalcified hard tissues for thin sections of 3-6 µm, and hard embedding materials such as glycol methacrylate, methyl methacrylate (MMA), or Spurr's resin are chosen for un-decalcified hard tissue, for heavy-duty (metallic specimens) sectioning ranging from 50-200µm.

Dehydration follows fixation, and has the goal of removing all the water contained within the specimen, to allow uniform penetration of the resin. This process is essential because the resins used are not water-soluble. It is obtained by immersing the specimen in alcohol solutions of increasing concentration, for a specific time that vary from 15 min to 24h, depending on the size of the specimen (time may be reduced when vacuum is applied). For the infiltration stage, commonly used resins for infiltrating and embedding are Technovit 7200 Kulzer, Technovit 8100 Kulzer, Technovit 9100 Kulzer, Epon, L-R White, Spurr's resin and other MMA resins. All of them are initially fluid, but they solidify during polymerization. Resin embedding takes place into molds that do not react with the resin, and results hard blocks containing the tissues to be trimmed and cut for examination. [4] The classical and most used material for infiltration techniques is glycometacrilate (Technovit 7200®, VLC – Heraus Kulzer GMBH). [5] The infiltrated specimens are placed into embedding molds, and polymerisation is performed under ultraviolet light, first under low-intensity UV light for 4h, followed by high-intensity UV light for 12h, and finally by keeping the samples heated for 24h, to ensure complete polymerization. [6] In a report of using Technovit 9100N as an embedding media for immunohistochemical staining, Rammelt *et al.* (2007) conclude that

embedding of histological specimens in Technovit 9100N allows both morphological and immunohistochemical evaluation of the bone-implant interface on non-decalcified sections. Compared with paraffin embedding, mofological details of bone tissue are preserved better, and redistribution of matrix proteins is avoided.[12]

Technique of cutting and grinding

Donath and Breuner (1982) described a method for successful preparation of histological slides of previously non-sectionable ceramic or metallic material included in bone and soft tissue for therapeutic purposes. The Säge-Schliff ("sawing and grinding") technique was developped to permit the histological study of mineralized jawbones including teeth or metallic or ceramic implants. The purpose was to retain elements like dental restorations, crowns, enamel with calculus and plaque *in situ*, and also to preserve the tissue surrounding the implant and to the teeth. [2]

Various researchers describe different bone sectioning systems: Blanco et al. (2010) uses the Exakt System, as well as Calvo-Guirado et al. (2015) and Erdogan et al. (2013). Following the fixation of the samples glued to a sample holder, longitudinal sections of 200µm in bucco-lingual direction are cut with a band saw. They are mechanically polished using 1200 and 4000 grit silicon-carbide papers (Struers, Copenhagen, Denmark), until 70 µm thick samples are obtained. [9]

Staining techniques

In general, the stains used for non-decalcified samples are basic fuchsin and toluidine blue. The toluidine blue staining is commonly used because is easy to perform and fast – it takes 15 minutes to complete the coloration. The toluidine blue has a specific affinity for nucleic acids, and therefore binds to nuclear material of tissues with a high DNA and RNA content. Mastocytes are stained in purple and nuclei in blue, mineralized laminated tissue presents as uncolored to pale blue and calcified matrix is dark blue. [13] Acid fuchsin stains cementum, dentin, bone and the soft tissues with different red colorations, and also collagen fibers. Acid fuchsin has a good penetration in the resin and stains the tissues very strongly. [14]

Analysis of the specimens

The more detailed and complex implants appear to be, the more researches attempted to develop an optimisation for the implant design or surface, however, it is sometimes difficult to register a detailed bone response after a given time, with enough resolution and cost effectiveness, using current histological methods.

Micro-computed-tomography (µCT), first described by Feldkamp et al. in the late 80's was used in order to describe the bone architecture in relation to bone disorders. [8] A voxel is composed of 1mm of images and it is produced by a clinical CT, while µCT produces approximately 1,000,000 times smaller than regular CT scanning. [15]

Vandeweghe et al. (2013) consider histology as an evidence for both qualitative and quantitative information, but points to the problem of the reduced number of sections, which represents a limitation of the research. [16] Their study compared histological evaluations (using a light microscope Eclipse ME600, Nikon, Japan) and microCT (microCT 40, Scano Medical, Basserdorf, Germany). The slices resolution had 36 µm on µCT and 40µm on ground sections using the Exakt sawing and grinding equipment. First, the 3D reconstruction was done, followed by the embedding and sectioning for histomorphometry, in order to compare the BIC (bone-implant contact) percentage and the BA (bone area) percentage. µCT is a fast, non-destructive method and allows a 3D-evaluation, when compared to histological sections. In the mentioned study, signifficant differences between the two methods appeared only in the BA at 2 weeks in favor of titanium implant; histology resulted in a higher value in time over the HA implants, while µCT did not. Differences between the two methods can appear depending on the cut direction and slice thickness, as Sarve et al. (2011)[7] recently

demonstrated. µCT can allow evaluation of the total circumferential space and 3D reconstruction, while histomorphometry is limited to one or a few slices. An optical comparison made by Van Oossterwyck et al. (2000) concluded that both methods have similar results. [17] The limitations of the µCT method are the price, the "noise" around implant that can affect the result (Schouten et al. 2009), the blurred border around the implant due to metallic artifacts and the relatively poor resolution of the image (Stoppie et al. 2005). Other studies failed to find a correlation between the classical parameters and µCT measurements. In fact, some bone quality parameters obtained by µCT scanning in peri-implant tissues did not seem linearly correlated to biomechanical variables.[8,11]

Histology is still considered as the "golden standard", but has limitations. For example, cutting and grinding can affect the implant in the bone blocks and can influence results. The biggest problem of the histology method is that it is a 2D replica of one slice, hence, we are not sure if that section represents the whole situation accurately. µCT contains more information of bone characteristics, as density, but histology about the cells content is missing. [7]

The level of osseointegration is usually measured by histological assesment of bone to implant contact (BIC) areas in un-decalcified hard tissue sections. One major disadvantage of non-decalcified sectioning is a significant loss of biological tissues during the histological processing of serial sections and therefore, only a maximum of 2-3 slices are available which may not reflect the entire healing processes at the investigated site. Also, the amount of time needed for the processing of hard tissue sections, delaying data analysis and results delivery. This evaluation is limited to 2D, and so, different orientations cannot be investigated, and large biopsies are needed for analysis. Micro-CT is non-destructive and non-invasive tool and has numerous advantages including a fast and automated characterization of structural features such as bone volume density or the assessment of BIC values in different planes and also 3D. Also, it can be used intravital, in different time points within the same sample.

To verify if micro-CT and histomorphometry give the same results, BIC is used comparatively between 2D and 3D slices, in which corresponding image elements are aligned (Becker et al. 2015).

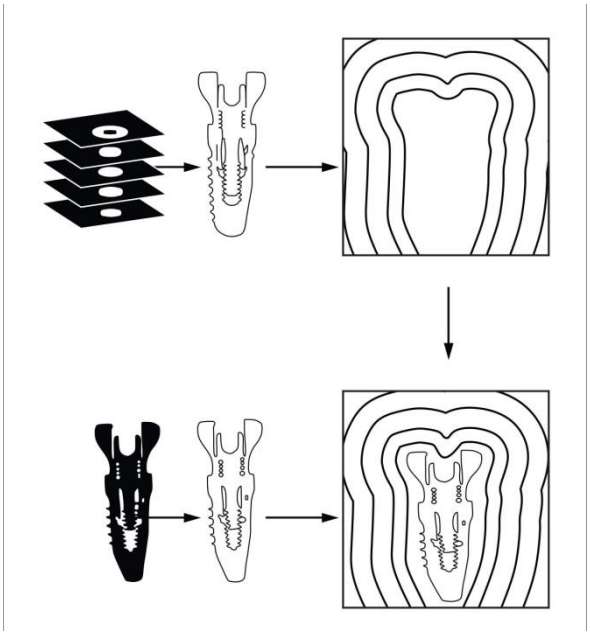

Figure 1. The "Chamfer matching algorithm" applied to compare the 2D (histomorphometric) and 3D (micro-CT) slices of an osseointegrated dental implant (altered after Becker et al. 2015).[18]

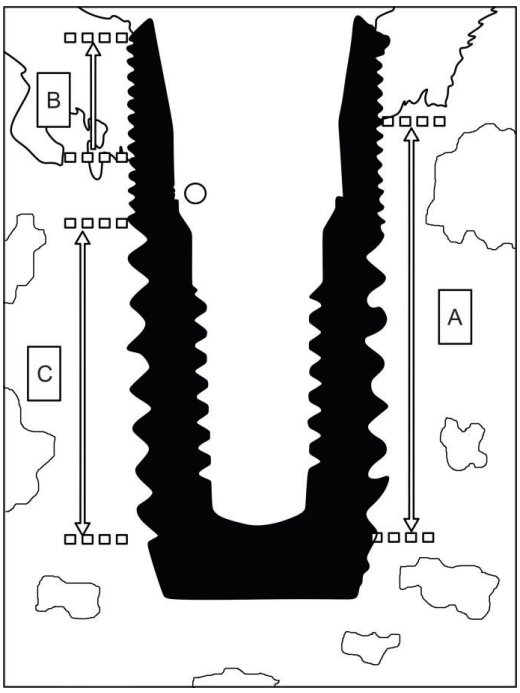

Figure 2. Example of histomorphometric landmarks for an osseointegrated screw-type dental implant: (A) bone-implant contact (BIC) % over the entire implant length, (B) epithelial downgrowth related to the whole implant length starting with a reference point (here – the first microthread), (C) difference in bone mass measured in triangular areas inside and outside the macrothreads (altered after Bousdras et al. 2007).[19]

Table 1 presents several studies where the authors preferred histomorphometry to comparatively observe the modification of bone immediately after the implatation. BIC% values (the percentage of implant lengh at which there is direct bone implant contact without other tissue) are presented in comparison to μCT results.

Table 1. Results of selected studies measuring the distance between the margin of peri-implant mucosa (PM) to the marginal bone crest (BC), or to the most coronal point/peak of contact between bone and implant (B/I) in comparison histomorphometry and micro-CT for the same samples, in the same time

Author	Bio-model	Time of histomorphometry/ scanning	Observations	**Histomorphometric result**	**μCT result**
Vandeweghe S. *et al* 2013	Rabbit	2 weeks	Ti implants in the condyle of the distal femur	25.25±7.22	24.11±6.93
			HA implants in proximal tibia	28.49±17.15	33.74±8.75
		4 weeks	Ti implants in the condyle of the distal femur	28.86±8.73	24.53±5.63
			HA implants in proximal tibia	42.51±9.45	42.19±14.46
Bernhard R. *et al* 2012	Minipig	4 weeks	Xive®(Friadent, Dentsply, Germany) implant in maxila	88.97 ± 18.37	84.70 ± 17.72
				70.56 ± 20.52	78.66 ± 20.52
				62.31 ± 17.28	65.90 ± 17.52
				87.57 ± 21.67	69.29 ± 26.23
				77.42 ± 35.54	70.01 ± 25.78
				84.37 ± 20.38	73.84 ± 22.10
Gabler C. *et al* 2015	Rat	6 weeks	Custom-made conical titanium alloyed (Ti6Al4V) implants in tibiae	32.4 ± 27.9	51.3 ± 11.6
				53.5 ± 19.2	62.0 ± 9.6
				45.7± 22.9	51.8 ± 13.3

One can note from the values in Table 1, that *in vivo* studies of bone-implant-contact (BIC) are difficult to compare, because of differences in several parameters: animal model, the anatomical part of the section, the age of the animal that influences the bone composition. Also, the observed healing period differed form 2 weeks to 6 weeks in these studies as well as the type, shape and surface of the implants used. [13] Vandeweghe et al. determined that BA (bone area) and BIC data obtained from histomorphometry and micro-CT correlated well, although the histomorphometry values are slightly higher than those obtained with micro-CT. However, BIC is poorly visualised on micro-CT images due to artifacts from the metal implant, and so, this method of examination is not recommended for evaluating BIC.[16]

The nature of the specimen and the specific goals of the study should determine the most appropiate methods of fixation, embedding, sectioning and staining. Although a number of different methods are being used for preparing sections of un-decalcified tissues and implants, ethanol or formalin fixation, plastic embedding and hand grinding to be cost-effective methods for many types of specimens.[20] The histological process of un-decalcified bone and implant samples is slightly complicated because of containing both mineralized hard tissues and soft tissues. Decalcification uses agents the can deteriorate the tissue structure and it can appear diferences that can be observed on clear staining of details by the histological stain. µCT depends on the mineralisation rate of the bone tissue, therefore, the newly formed bone, which is not as mineralized in the early phases of bone formation, cannot be quantified through this method.[13]

CONCLUSIONS

Histomorphometry can be used according to detailed protocols for separating the samples, staining, embedding, slice sectioning, by using different resins and stains, to obtain indicators of osseointegration at different timepoints, in different experimental models. µCT can be used for a fast, full 3D reconstruction of the area of interest, allowing a fast but costly result, while histomorphometry is more cost-effective for the amount of information that can be obtained.

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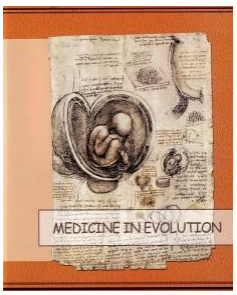
Therapeutic possibilities of progeny syndrome in temporary dentition versus young adult



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Abstract

Objectives: Evaluation and treatment of patients with class III abnormalities of which were addressed Orthodontics Clinic Cluj-Napoca, Romania, between 2015-2017. Intercept option for treatment, orthodontic and surgical-orthodontic difficult, depending on patient age, extension of skeletal deformity, extent of the soft tissues and dental compensation, and patient compliance.

Materials and methods: The study was conducted on a sample of 324 patients who sought treatment in 2015-2017. The diagnosis was made based on clinical and paraclinical examination and treatment was individualized based on age and index of difficulty of each case. Statistical data processing was performed using the program Statistics 7.0.

Results:78 patients (24.07%) had a syndrome of clinical forms of progeny. Anomaly interests 6-9 years age group the rate of 39.74%, 9-12 years the ratio is 24.35% over 12 years as a percentage of 35.89%. 91.02% of patients had associated anomalies. Gender distribution was 57.69% girls and 42.30% boys.

Conclusion:A step by step analysis influence progeny syndrome treatment individualization, which predicts an option for single orthodontic treatment or one combined surgical-orthodontic complex.

Keywords: progeny syndrome, interception, ortognatic surgery.

INTRODUCTION

The need for early identification and treatment of malocclusion, class III is accepted worldwide. Serious form of dento-maxillary, progeny syndrome requires monitoring since early childhood. Thus, temporary teeth, progeny syndrome diagnosed with frontal reverse occlusion requires immediate therapeutic measures, the interception of the anomaly, treatment to prevent worsening of anomaly or transmit occlusion phenomena installed. Usual treatment of class III set in temporary teeth and mixed will significantly decrease the number of patients will require ortognatic surgery. The child grows older, the treatment becomes more difficult and time increases. The permanent teeth orthodontic treatment is only a stage prior to surgery, which is indicated after the growth process.

Aim and objectives

Evaluation and treatment of patients with class III abnormalities of which were addressed Orthodontics Clinic ClujNapoca, Romania, between 2015-2017. Option for intercept treatment, orthodontic and surgical-orthodontic difficult, depending on patient age, extension of skeletal deformity, extent of the soft tissues and dental compensation, and patient compliance. The choice of treatment is especially difficult, as the increase of skeletal involvement and occlusion of malocclusion.

MATERIALS AND METHODS

The study was conducted on a sample of 324 patients who sought treatment in 2015-2017. The diagnosis was made based on clinical and paraclinical examination and treatment was individualized based on age and index of difficulty of each case. Statistical data processing was performed using the program „Statistics 7.0".

RESULTS AND DISCUSSIONS

78 patients (24.07%) had a syndrome of clinical forms of progeny(Fig 1). Clinical forms encountered in the study were represented in proportion of 67.94% for reverse gear, 20.51% of progeny false, 6.41% of progeny anatomical and 5.12% of undershot functional (Fig. 2). Anomaly interests 6-9 years age group the rate of 39.74%, 9-12 years the ratio is 24.35% over 12 years as a percentage of 35.89%(Fig 3). 91.02% of patients had associated anomalies. Gender distribution was 57.69% girls and 42.30% boys (Fig 4).

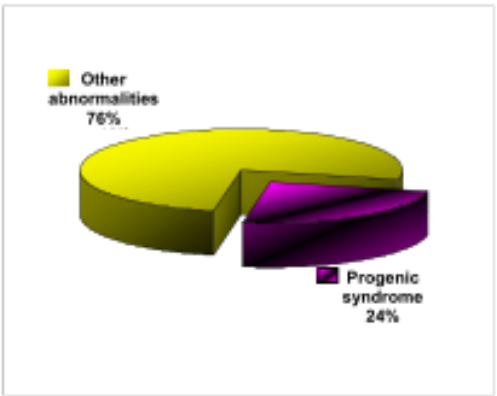


Figure 1. Frequency of progeny syndrome

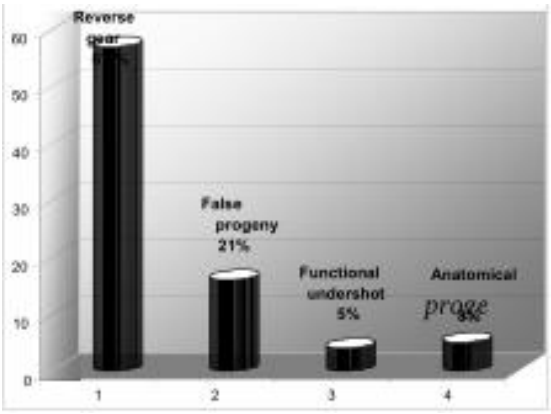


Figure 2. The frequency of clinical forms of progeny syndrome

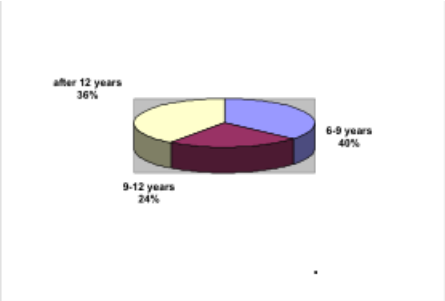


Figure 3. Distribution of age groups of patients withprogeny syndrome

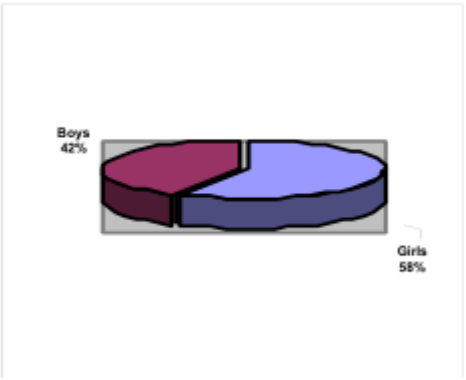


Figure 4. Distribution on sex of progeny syndrome

Found a 91.02% rate of associated anomalies (Fig. 5).Meet etiological factors were 62.82% rate of local factors, 20.51% functional factors and 16.66% and hereditary factors (Fig. 6).

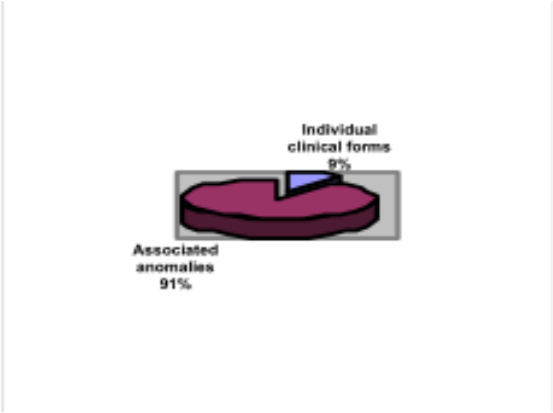


Figure 5. Association with other anomalies dentomaxillary

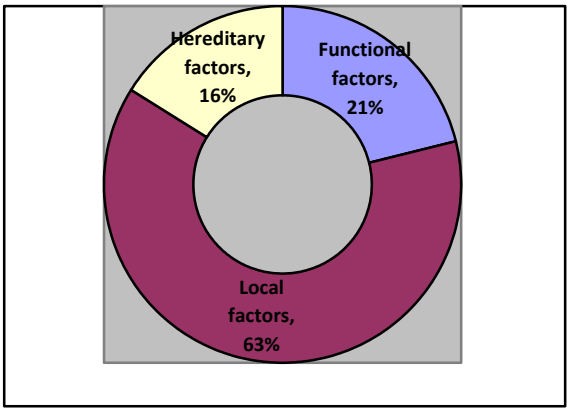


Figure 6. Frequency of etiological factors in the syndrome progeny

Individualized treatment based on age and gravity anomaly and involvement of bone structures will be illustrated by presenting some clinical cases suggestive of each type of anomaly.

Figure 7. G. D., 5 years, functional undershot

Figure 5. Association with other anomalies dentomaxillary

Figure 6. Frequency of etiological factors in the syndrome progeny

Figure 8. G. D., 5 years, extra-oral traction

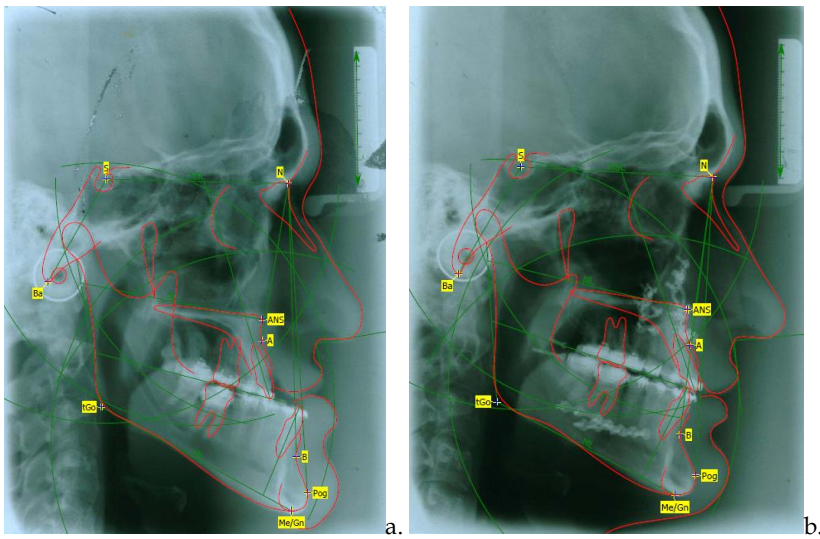
Figure 9. G. D., five years, part occlusion final phase

Case should be monitored by growth phase.

Case 2 – C.R., 19 years, mandibular prognathism.

Figure 10. C.R., Appearance exo-oral - initial phase

Figure 11. C.R. Endo-oral aspect



a. b.

Figure 12. (a) teleradiography profile - initial phase, (b) teleradiography profile – intermediate phase

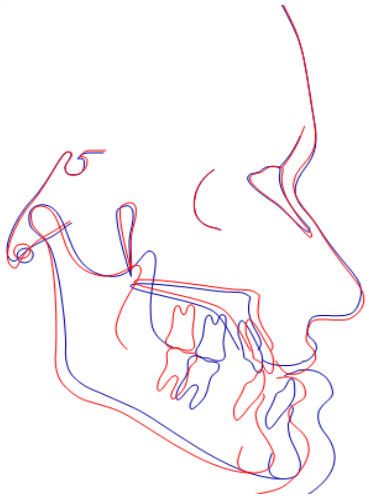
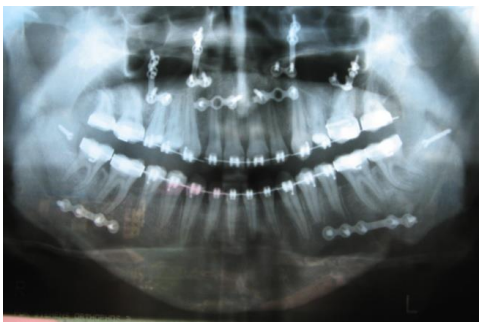


Figure 13. Teleradiography superpositions

Table 1. Teleradiography values - initial values and after orthognathic surgery

TWEED	**initial**	After orthognathic surgery
FMA = 25+/-3	34	31
IMPA = 88+/-3	86	89
SNA = 82	81	85
SNB = 80	93 □	86 *
ANB = +2	+12 □	+1 *
Ao-Bo	+15 mm □	+3 *
HFA = 65mm	69 mm □	67
HFP = 45mm	56 mm □	44
> Z= 78	84 ↓	82
axaY =65+/-5	61	59
SASSOUNI	Skeletal Class III 16 mm Alveolar Class III 9 mm OB 3mm	Skeletal Class I Alveolar Class I OB 3 mm


a)

b)

Figure 14. (a) OPT after orthognathic surgery, (b) occlusal appearance intermediate phase

Ending the orthodontic treatment will continue with finishing phase and contention of the result.

CONCLUSIONS

Individualization of treatment in the progeny syndrome should be based on age and gravity anomaly.

In temporary dentition treatment with simple miofunctional devices and myogymnastic exercises the phenomena specific to class III are resumed, creating the possibility of harmonious development of the dento-maxillary apparatus.

Depending on the involvement of maxillary dental appliance components, treatment is intercepted, single or combined orthodontic surgical-orthodontic complex.

Acknowledgements

All authors contributed equally.

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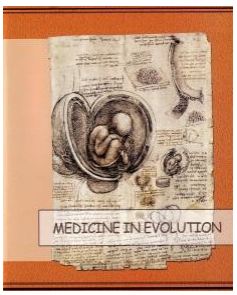
Gingival Involvement in Oral Herpes Simplex Virus infections



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Abstract

The aim of the study is to assess the clinical features of gingival involvement in viral infections caused by herpes simplex virus (HSV). 165 medical charts of patients diagnosed with oral viral infection, over a period of 20 years, were analyzed. All patients presented with oral lesions in the clinical department of Oral Pathology Discipline, Faculty of Dental Medicine, University of Medicine and Pharmacy "Carol Davila", Bucharest where they were diagnosed and treated. Gingival involvement was reported in 55.1% of cases and in 12% gingival lesions were the only sign of the underlying herpetic infection. Because of the change in clinical appearance and symptoms, supplementary laboratory tests are now required in order to confirm the diagnosis. Further studies should be conducted in order to confirm these finding.

Keywords: gingiva, herpes simplex virus, gingivostomatitis, recrudescent infection.

INTRODUCTION

HERPES SMPLEX VIRUS (HSV)

The Herpesviridae family contains nine viruses that are pathogenic in humans. Of these most frequently encountered are HSV-1, HSV-2, varicella-zoster virus (VVZ), Epstein Barr virus and cytomegalovirus (CMV). The structure of the herpes virus is: internal core-containing the viral genome, an icosahedral nucleocapsid and an outer lipid envelope containing viral glycoproteins on its surface that are derived from host cellular membranes [1].

HSV-1 is a α-herpesvirus and it is a ubiquitous virus to which the majority of humans are exposed during their lifetime. Usually the exposure occurs by the teenage years, but occasionally it may occur later in adulthood [2]. Primary herpetic infection usually arises between 6 months and 5 years and is rarely seen in adults [3]. The incubation period is 6-7days [5].

Classically the herpes virus infection is divided into two types: type 1 usually occurs above the waist, most frequent in or around the mouth, and type-2 that usually occurs below the waist in the anogenital region [3]. Because of changes in sexual practice it is not uncommon to see oral lesions caused by HSV-2 and vice versa.

HSV is neuroinvasive and neurotoxic. Infection occurs by inoculation of the oral mucosa with infected secretions. After this the virus travels along the sensory nerve axons and establishes a chronic infection in the sensory ganglion [1] - usually the trigeminal ganglion. Here he remains latent. Reactivation results in viral shedding clinical recrudescence-usually as herpes labialis [4]. Studies have shown that the virus can be identified in the saliva of patients that don't have active oral lesions. This may explain why the herpetic virus infection is very common. 70% of middle-aged adults had contact with the virus, but most of these infection were subclinical [3].

PRIMARY HERPETIC GINGIVOSTOMATITIS

In primary infection produces a distinctive intraoral ulcerative pattern known as herpetic gingivostomatitis [3]. Patients experience a viral prodrome of 1-3 days with fever, malaise, cervical lymph node enlargement, nausea, loss of appetite and headache. Oral signs of the gingiva and oral mucosa are noticed shortly after the prodromal signs. Gingival edema, erythema, vesicles and ulcers are prominent features of primary infection. Ulcerative lesions begin as small vesicles that usually group in clusters, they rapidly break down to form coalescing, irregularly shaped ulcerations that are usually shallow [2]. Pain is severe thus making eating and drinking very difficult- in some cases hospitalization is required. Absent or poor oral hygiene leads to halitosis, coated tongue and bacterial gingivitis. Rarely acute ulcerative gingivitis follows as a secondary bacterial infection [5]. Excessive drooling and the fact that the saliva is heavily infected with HSV leads to cross-infection and skin lesions. In children with oral habits digits may present painful whitlow consequence of autoinoculation. In the absence of treatment full recovery is expected in 10 to 14 days.

Diagnosis

Diagnosis is clinical but if possible microbiology and serology investigations should be performed in order to confirm which strain of virus is involved. Viral studies include:

- PCR: highly accurate but expensive, also since it determines the antigen not the antibodies a positive PCR dose not necessarily mean an active infection [1];
- Electron microscopy;
- Culture: it has high sensitivity and it permits testing for sensitivity to antiviral drugs, but takes time and it's expensive;
- Smears from the base of lesions:
    - basic citology: doesn't distinguish HSV from VVZ;

- direct fluorescent antigen detection: more accurate then routine cytology

- Serology: primary infection is associated with elevated levels of Ig M

Differential diagnosis

In some cases ulcers may resemble minor aphtous stomatitis but large gingival involvement leads away from this diagnostic. Other viral infections must be considered especially Coxsackie virus: herpangina and hand-mouth-foot; in these instances the gums are not involved and lesions aren't usually clustered. Chickenpox and shingles, erythema multiforme and leukemia [4] must also be ruled out.

Treatment

Acyclovir is the antiviral most frequently used. Topical usage of an acyclovir elixir in the first three days shortens the duration of symptoms and infectivity [3]. Also famciclovir and valacyclovir demonstrated equal efficiency. Ibuprofen or acetaminophen is used to alleviate pain and reduce fever. Also protective coating agents may be applied before meals in order to relive pain and allow eating and drinking.

SECUNDARY INFECTION

RECRUDESCENT ORAL HSV INFECTION

Reactivation of the virus may be asymptomatic with shedding of the virus in saliva and oral secretions-representing an important risk factor for transmission because no systemic signs are present. Symptomatic reactivation generates oral ulcers especially on the attached gingiva, hard palate, and dorsum of the tongue [1]. Extensive oral lesion are rarely seen in healthy adults. Immunocompromised patients present frequent reactivations with extensive lesions. In these cases systemic acyclovir is a viable option, sometimes daily intake of low doses of antiviral may be recommended in order to prevent frequent reactivation [6].

Some of the trigger factors incriminated are: dental procedures, UV exposure, local trauma, stress.

RECURRENT HERPES LABIALIS

The virus survives in the nerve ganglia of the area and its DNA is incorporates in to the hosts DNA [3]. Reactivation may be due to dental procedures, pregnancy, age, excessive UV exposure, trauma- among others. Prodromal signs usually include: itch, burning sensation, soreness, redness, paresthesia of the affected area. Lips are the most frequent sight of involvement, especially at the muco-cutaneos junction. The basic lesion is the vesicle of 1-3mm diameter [3]. Clustered vesicles filled with clear fluid tend to coalesce. These vesicles rupture and a brown crust is formed. Because of the mobility of the area involved the crust frequently cracks generating oozing and bleeding. In absence of treatment healing occurs in 7 to 10 days.

Treatment is controversial in recurrent herpes labialis. Antiviral therapy must be evaluated from patient to patient in order to assess the risk/benefice ratio. Viral resistance to acyclovir must be a warning sign against overuse. Topical antiviral medication such as acyclovir cream, panciclovir cream and docosanol cream are efficacious [1].

Aim and objectives

The objective is to present to dentists the signs of gingival involvement in acute infection with HSV. The study is a descriptive analysis both of **topography** and extension of lesions. Dental practitioners must be able to recognize and treat adequately both primary and secondary infections. In most instances patients seek out advice from their dental provider and not from the pediatrician or family physician. Studies have shown that elaborate dental procedures and oral surgery trauma (sometimes after local anesthesia injection) lead to reactivation of latent infection in 8-10% of cases [1]. Knowing that HSV infection is diagnosed meanly by history and clinical appearance we find it further more important to underline the features of this infection. Dental practitioners must know that frequent reactivation with

widely spread oral lesions requires further investigation as they are sign of immunodeficiency. Dental practitioners must educate their patients in order to avoid cross infection. It is also their responsibility to help patients manage their suffering by adequate medication to alleviate the symptoms, proper oral hygiene practices to avoid secondary bacterial infection and adequate nutrition in order to prevent dehydration. Since gingival manifestation is a distinctive sign of oral HSV infection we find it appropriate to outline all type of lesions that involve gums, in order to facilitate a proper diagnoses.

MATERIAL AND METHODS

The study was performed in the clinical department of Oral Pathology Discipline, Faculty of Dental Medicine, University of Medicine and Pharmacy "Carol Davila", Bucharest from 1997 to 2017. The medical charts of 170 patients with herpetic infection were reviewed.

They were divided into 2 study groups. Study group one included 90 patients with primary herpetic infection. The inclusion criteria's were:

- Patients history:
    - No recollection of a previous episode of oral/extra-oral HSV
    - Prodromal signs
- Clinical features:
    - Multiple vesicullar-ulcerative lesions
    - Multiple areas affected

And study group 2 which included 80 patients with recurrent herpetic infection. The inclusion criteria's were:

- Patients history: recollection of one or more episodes of oral herpetic lesions prior to this one or general symptoms
- Clinical features: vesicullar-ulcerative lesions on the keratinized gingiva or on the lips at the muco-cutaneous junction

We analyzed: sex, age, time from onset, presentation date, prodromal signs, extent of lesions, laboratory tests for viral string confirmation, use of local and systemic drugs.

RESULTS

A total of 170 medical charts were analyzed. From the first study group (S1) 3 patients were eliminated because of insufficient data resulting 87 cases that were further analyzed. From the second group (S2) 2 patients were eliminated for the same reason resulting a study group of 78. The primary study group (PSG) includes both study group 1 and 2 and sums up to 165 patients. Of these 95 were females and 70 men. Female mean age was 31.6 years and male average was 19.5 years. Because age is important for differential diagnose each study group was individually analyzed.

In the primary infection group F: M ratio was 0.8:1 (46M- 52.8% and 41F- 47.1%). Mean age of the group was 17.7 years old (18.8 years females and 16.8 years men).

In the second study group F: M ratio was 2.12:1 (53F- 67.9% and 25M- 32%). Mean age was 36.1years old, with the mean age of females' 37.9 years and men average age 32.4 years.

Laboratory tests showed HSV1 infection in all cases, but also with HSV2 in 2 cases both females, one 18 years old and one 28 years old.

Gingival involvement was reported in 91 cases. Of these 63 (69%) were from the first study group and 28 (30.7%) from the second one. Female: male ratio was 0.98:1 (49-53.8% F and 50-54.9% men). Laboratory tests confirmed viral infection with both HSV1 and HSV2 in 2 cases with gingival lesions. Some of these patients presented with prodromal symptoms (Figure 1).

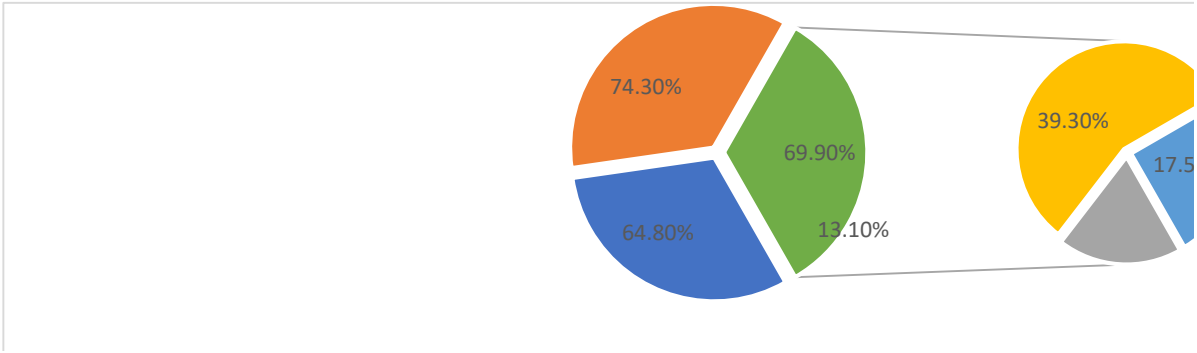

Figure 1. Prodromal symptoms in patients with herpetic gingivitis

In 12 (13.1%) cases clinical findings were confined to the gingiva, making gingival involvement the only sign of an acute herpetic infection. 25% of these cases were accompanied by high fever, 33.3% presented with enlarged lymph nodes and 25% accused asthenia.

Among the patients with herpetic gingivitis the next oral areas were involved (Table 1):

Table 1. Oral sites of involvement in patients with gingival lesions

Site of involvement	**Number-Percentage%**
Tongue-margins	9- 9.8%
Tongue- tip	15- 16.4%
Tongue- dorsal surface	11- 12%
Tongue- ventral surface	9- 9.8%
Hard palate	30- 32.9%
Lip- upper	20- 21.9%
Lip- lower	43- 47.2%
Labial mucosa	6- 6.5%
Floor of mouth	5- 5.4%
Buccal mucosa	32- 35.1%
Retro-molar area	4- 4.3%
Soft palate, tonsillar pillar and pharynx	19- 20.8%

Taking into considerations all patients from the primary study group the distribution of oral lesions was as follows (Table 2).

Table 2. Oral sites of involvement in patients with oral herpetic infection

Site of involvement	**Number-Percentage%**
Hard palate	48-29%
Soft palate	17- 10%
Tongue	64- 38.7%
Buccal mucosa	46- 50.5%
Floor of mouth	8- 4.8%
Retro-molar area	4- 2.4%
Vermillion border-upper lip	53- 32.1%
Vermilion border-lower lip	87- 52.7%
Lip- mucosa	6- 3.6%
Tonsillar pillar	11- 6.6%
Gingival lesions	91- 55.1%

Regarding the number of areas that presented lesions patients were included in 3 different groups: group 1- 1 affected area (32.1%), group 2- less than 3 areas involved but more than one (47.2%), group 3- more than 3 areas involved (20.6%). (Figure 2)

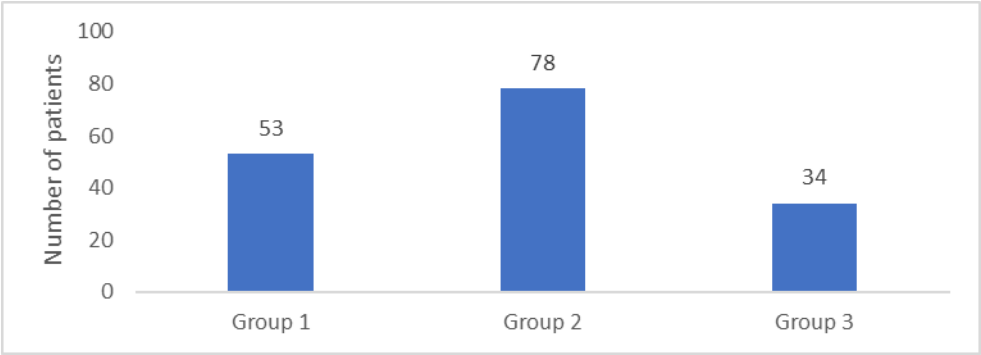

Figure 2. Number of areas that presented lesions- group 1 (1 area), group 2 (1-3 areas), group 3 (>3 areas)

112 patients (67.8%) presented themselves within one week from noticing the lesion(s) or experiencing prodromal signs. The other 53 (32.1%) waited between 10 days and 2 weeks before seeking medical advice. In all patients with general symptoms oral lesions followed within 1 to 4 days.

43 patients (26%) were following an antibiotic treatment when they presented, usually prescribed by the family physician. Of these 12 (27.9%) were diagnosed with recurrent herpetic infection and 32 (74.4%) with primary herpetic infection.

DISCUSSIONS

The first significant difference between our study and the literature is the age of the primary infection group. We found the mean age to be 17.7 years old, while Neville states that it arises between 6 months and 5 years of age [3] and C. Scully reports it to appear between 2-4 years old [5]. This may be explained by the fact that our study was performed in a medical department of oral pathology. Children less than 5 years old are rarely referred to us, they usually seek out the pediatrician's advice. It is he who diagnoses and treats the primary HSV infection. Most of the patients were between 16-23 years old, which is in correlation with the findings of other studies.

This may also account for the large number of patients with herpetic gingivostomatitis that were following antibiotic treatment when they presented themselves. Most patients recall visiting the pediatrician or the family physician after 2 days of experiencing prodromal signs and, at his/hers advice follow an antibiotic treatment, only to notice after 1-2 days the presence of oral lesions.

Another explanation may be derived from the fact that some patients had lesions on the tonsillar pillar. This could have been mistaken for bacterial pharingotonsillitis and treated with antibiotics.

The oral sites we found to be typically involved (attached gingiva- Figure 3A,3B and dorsum of tongue-Figure 3C, ventral tongue, soft palate, hard palate- Figure 4) are in accordance with the findings of other studies [10, 11].

Figure 3A. Gingival ulcers in primary herpetic gingivostomatitis

Figure 3B. Gingival and labial ulcers in primary herpetic gingivostomatitis

Figure 3C. Small ulcer on the dorsal tongue in primary herpetic gingivostomatitis

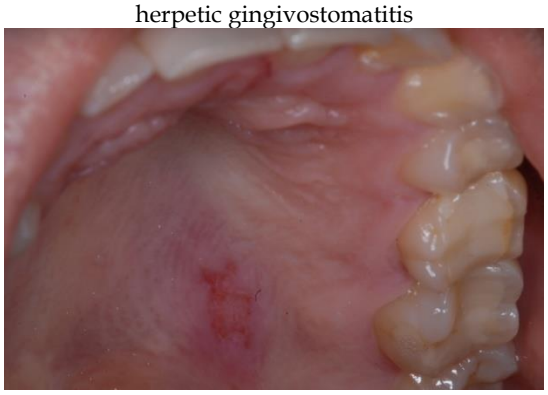

Figure 4. Clustered ulcers in secondary herpetic infection

We found that the type of herpetic infection (primary/recrudescent) associate a higher frequency among some oral sites of involvement. There for it is important to know patients history in order to establish if the infection is primary or recrudescent, usually patients with secondary infection recall one/more episodes of vesicular lesions [12, 13].

Although Christie&co have shown that recrudescent herpes simplex infection may sometimes mimic primary herpetic gingivostomatitis [14]. Because of these findings differential diagnosis can no longer be accurate if it's based only on clinical signs. Therefor confirmatory laboratory diagnosis is no longer required when patients are, or may be immunocompromised as Arduino&co suggested in one of their articles [15] but in all patients with wide extensive lesions.

Another relevant difference is that of the percentage of patients with gingival involvement- we found herpetic gingivitis in 55% of case (of these 68% were from the first study group), which is in contradiction with Neville's statement that all patients with primary gingivostomatitis have gingival involvement [3].

CONCLUSIONS

The variability and diversity of clinical features, the change in age, and the change in treatment responsivity transforms the classic herpetic infection into a polymorph oral pathology. As more and more studies have shown extensive lesions that mimic primary herpetic gingivostomatitis are now more commonly encountered in adolescents and young patients. In order to establish a correct diagnosis patient's history and clinical aspect are no longer sufficient, laboratory tests become mandatory.

Patient's symptomatology has also shifted to more aggressive features. Malaysia and asthenia are more commonly encountered, as well as lymph node enlargement and fever, even in recrudescent forms.

Dental practitioners must be advised that gingival involvement can be the only sign of an active infection (our study reported it in 12% of cases). This can raise serious difficulties in

reaching a correct diagnose, especially if other systemic signs are absent. It also represents a health risk issue since these patients are infectious.

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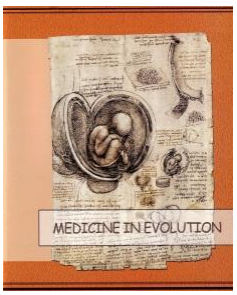
Assessment of a panel of risk indicators in severe periodontitis patients



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Abstract

Aim and objectives The purpose of this study was to analyse a panel of risk indicators in a group of twenty-two patients with severe periodontitis. We also aimed to test possible associations between these indicators and the severity of periodontitis assessed by clinical attachment loss (CAL) mean values.

Material and methods Periodontal status was assessed based on the CDC/AAP periodontitis case definition for population-based studies. Risk indicators, including age, gender, weight and height, level of education, and smoking habits, were recorded. Salivary cortisol level, as a marker of chronic stress, was also measured.

Results The mean age of the patients was 44.86 (SD 12.81; range 24 to 72). Ten females (45.5%) were enrolled. Testing possible associations between risk indicators and CAL mean values showed no statistical significant correlations, although trends of positive correlations were found between males, BMI, and CAL, respectively

Conclusions The present results suggest that a high BMI, as well as masculine gender, could have been important risk factors for severe periodontitis in this study group.

Keywords: periodontal disease, risk factors, prevalence.

INTRODUCTION

Periodontal disease may appear in various forms, such as gingivitis or periodontitis, and the main etiological factor is represented by the dental plaque. Depending on the inflammatory response, periodontal disease can be grouped into gingivitis and periodontitis. Gingivitis represents the inflammatory condition of the soft tissues surrounding the teeth (gingiva), and it can be influenced by several factors like: smoking, drugs, hormonal changes, etc. [1]. Periodontitis is a chronic inflammation which involves the destruction of the supporting structures of the teeth (periodontal ligament, bone, and soft tissues) and the rate of progression is slow to moderate, with periods of rapid progression. The progression and severity of the disease may be associated with one or more risk factors which can influence the host response [2].

Modifiable and non-modifiable risk factors can influence the periodontal tissue response to dental plaque [3]. The modifiable risk factors are represented by smoking, diabetes mellitus, microorganisms, psychological factors, nutrition, alcohol consumption, socioeconomic status and stress levels. The non-modifiable risk factors are represented by genetic factors, host response, osteoporosis, aging, and other diseases [4].

Aim and objectives

The aim of the present study was to investigate a panel of risk indicators of severe periodontitis. In addition, we aimed to test possible associations between these indicators and the severity of periodontitis assessed by clinical attachment loss (CAL) mean values.

MATERIAL AND METHODS

Subjects

A cross-sectional, pre-treatment study was conducted between October 2014 and August 2017. The investigation protocol was approved by the Ethics Committee of Science Research from Carol Davila University of Medicine and Pharmacy. Twenty-two subjects with severe periodontal disease were recruited from a dental private office in Bucharest. Subjects under 18 years old or with systemic diseases, such as: uncontrolled diabetes mellitus, osteoporosis, chronic hepatitis, liver cirrhosis, HIV/ AIDS, autoimmune diseases etc., were excluded.

Clinical data

Demographic data, including age, sex, weight and height, level of education, profession, medical history, medication used and smoking habits (recorded as smoker/non-smoker), was collected. Patients' self-reported height (in meters) and weight (in kilograms) were used to calculate body mass index (BMI; kg/m^2) using the standard formula. The dental chart included information about brushing frequency, auxiliary methods for dental hygiene and professional cleaning.

Oral examination

Clinical examination was performed in all present teeth, excluding third molars. The periodontal parameters, used and measured at four inter-proximal sites for each tooth, were: presence of bleeding on probing (BOP), probing pocket depth (PPD) and CAL. PPD (the distance from the gingival margin to the bottom of the pocket) and CAL (the distance from the cement-enamel junction to the bottom of the pocket/sulcus) were measured using a conventional periodontal probe. Severe periodontitis was diagnosed according to the clinical

case definitions proposed by the Center for Disease Control and Prevention [5]. Participants enrolled in this study signed a written informed consent.

Salivary cortisol assessment

Salivary cortisol level, as a marker of chronic stress, was measured. The patients were recommended to harvest saliva in the morning, after waking up, before brushing teeth, smoking, eating or drinking. Saliva was harvested in sterile containers, the day before administration of any kind of periodontal treatment. The samples were maintained at -20°C before processing. Cortisol determination was performed using a kit with serial number DSNOV20 from NovaTec Immundiagnostica GmbH. Salivary cortisol quantitative determination was performed using a colorimetric immuno-enzymatic method.

Statistical analysis

Data distributions were expressed as means, standard deviations (SD), ranges, and percentages, as appropriate. Associations between two continuous variables were tested using Pearson's correlation coefficient. Statistical comparison of the pre-treatment continuous measurements between the dichotomous variable based groups was performed using an independent t-test.

Statistical analyses were performed using Stata/IC 14 (StataCorp. 2015. Statistical Software. College Station, TX, USA). A p-value of 0.05 was considered statistically significant.

RESULTS

The mean age of the patients was 44.86 (SD 12.81; range 24 to 72). Ten females (45.5%) were enrolled. Six patients were current smokers (27.3%), of which four were males. Eleven patients (50%) completed tertiary education, whilst the other half completed secondary education level. Fifteen patients (68.2%) were urban residents. The mean BMI was 25.85 (SD 6.55; range 17.72 to 47.34). Ten patients (45.5%) underwent at least one professional cleaning during preceding year. Daily tooth brushing twice a day was reported by 20 patients (90.9%). Only one patient (4.6%) was using auxiliary methods for dental hygiene. The mean salivary cortisol level was 9.75 ng/mL (SD 7.93; range 1.72 to 30.71).

Testing possible associations between risk indicators and CAL mean values showed no statistical significant correlations, although trends of positive correlations were found between males, BMI, and CAL, respectively (Table 1; Figs. 1, 2).

Table I. BMI, gender and mean CAL measurements *per patient*

Patient crt no	BMI (kg/m^2)	Gender (male/female)	Mean CAL (SD) [mm]
1	21.26	female	4.08 (0.11)
2	26.85	male	3.25 (0.36)
3	27.53	female	3.83 (0.23)
4	19.61	female	4.25 (0.16)
5	23.88	male	4.01 (0.35)
6	27.77	male	4.18 (0.44)
7	20.03	female	3.49 (0.4)
8	22.94	female	3.75 (0.22)
9	24.97	male	3.83 (0.55)
10	25.21	male	2.68 (0.12)
11	20.03	female	4.23 (0.81)
12	21.26	female	3.81 (0.73)
13	25.35	male	5.44 (0.16)
14	28.48	female	3.46 (0.2)
15	47.34	male	3.97 (0.32)
16	30.49	male	3.95 (0.23)
17	26.42	male	4.16 (0.67)
18	17.72	female	3.73 (1.05)

Patient crt no	BMI (kg/m²)	Gender (male/female)	Mean CAL (SD) [mm]
19	27.78	male	4.47 (1.12)
20	27.7	male	3.45 (1.57)
21	19.15	female	2.7 (0.37)
22	36.95	male	5.35 (0.77)

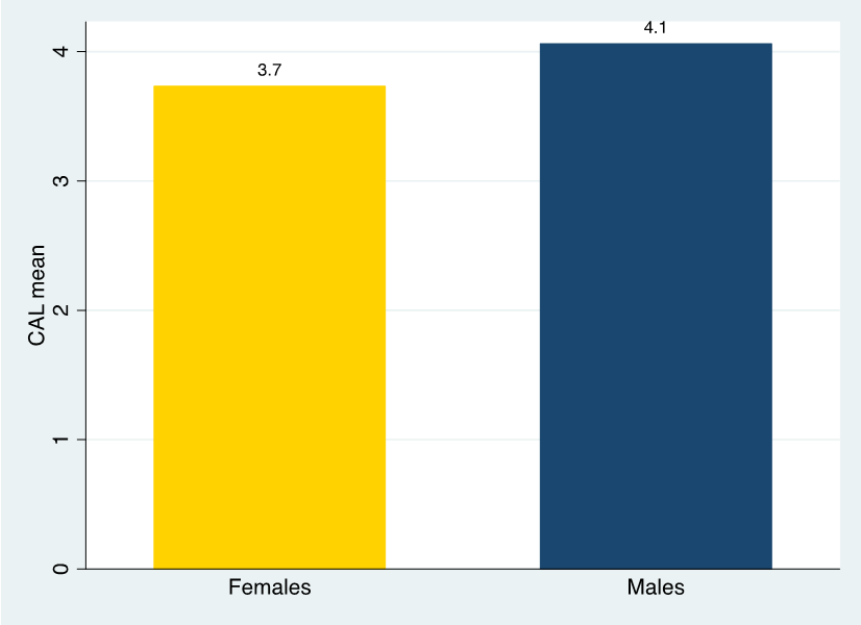

Figure 1. Mean CAL values depending on gender

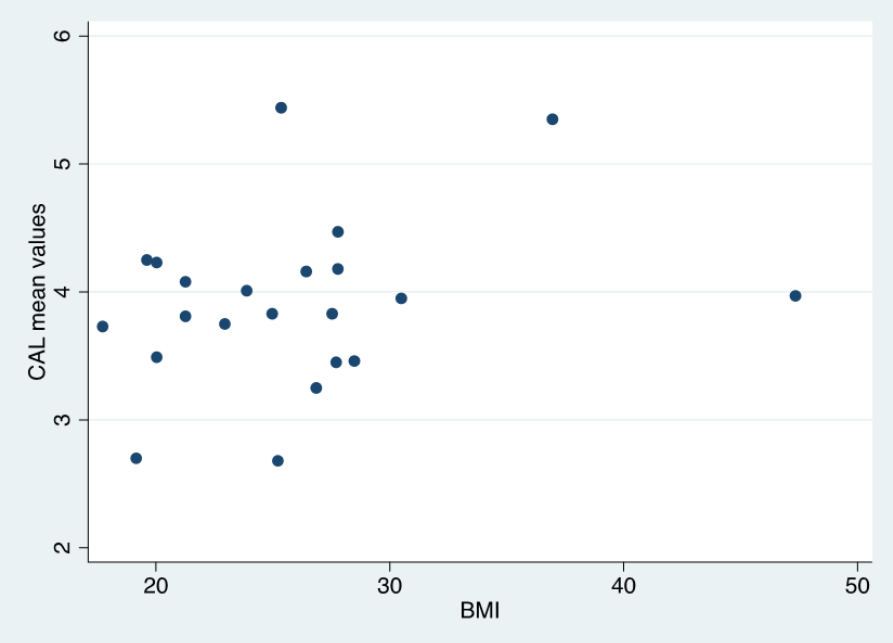

Figure 2. Distribution of CAL mean values depending on BMI

DISCUSSIONS

Age, gender, education level, socio-economic condition, systemic diseases, genetic predisposition represent factors which can have a role in the occurrence and evolution of the periodontal disease. To all these, local factors may be associated, such as improper oral hygiene, toothless, malocclusions, parafunctions or incorrect prosthetic, surgical, orthodontic treatment [6].

Prevalence and severity of periodontal disease increase with age. It is possible that the degenerative changes related to aging may increase susceptibility for periodontitis [7]. A study performed on 531 dentate individuals aged 25-75 years, examined the location of the alveolar bone in relation to cement-enamel junction and the presence of angular bony defects. The result of the study showed that bone loss was observed in 11 % of the subjects and was non-existent in ages below 35 years. It was also demonstrated that the mean annual rate of bone loss among subjects of 70 years old was 0.28mm, as compared to 0.07mm in 25-year-old patients. Thus, the increased severity of periodontal disease and bone loss with age are probably related with the length of periodontal tissues' exposure to the bacterial plaque or other risk factors [8].

Gender plays a role in periodontal disease. Men have poorer oral hygiene and more loss of attachment than women. A study performed on 4,290 randomly selected participants from the normal population (Study of Health in Pomerania) determined higher periodontal destruction among males, as compared with female population. The study revealed that the means of attachment loss and extent of sites 4 mm or greater were significantly lower in women than in men. Although this was a sign of healthier periodontal tissue, the number of teeth was lower in women than in men in all age categories, except the youngest (30 years or younger) [9].

High BMI is considered a risk factor for periodontitis. There is a 16% increased risk for periodontitis at 1 kg/m² for increased body mass. Obesity is defined as a BMI greater than 30 kg/m², overweight are people between 25-30 kg/m² and normal weight is between 19-25kg/m². Obesity is associated with deep probing pockets [3]. It modulates host immune responses, resulting in increased susceptibility to infections. Adipocytes are metabolically active and release a variety of inflammatory mediators. The possible mechanisms which can explain the association between obesity and periodontitis are: obesity associated with a systemic and locally increased inflammatory response; obesity's influence on dental plaque quantity and composition; and finally, a combination of both [10].

Current studies showed that persons who are socioeconomically disadvantaged can be related with gingivitis and poor oral hygiene. Socioeconomic disadvantage and racial discrimination may lead to stress [11].

Stress is a physiological and psychological condition caused by physical, mental and emotional stimuli, which tend to disrupt the functioning of an organism and on which a body normally seeks to avoid [12]. Chronic stress affects the host immune cellular response through the high liberation of neurotransmitters, such as epinephrine, norepinephrine and P substance which interacts directly with lymphocytes, neutrophils, monocytes and macrophages through the receptors which can accelerate the tissue destruction function [13].

The present results, in spite of the fact that no statistical significant associations were found between the above described risk indicators and periodontal status expressed by CAL means of full-mouth measurements, may be considered a good starting point for larger cross-sectional studies, as well as for prospective observational cohort studies.

CONCLUSIONS

In order to obtain an accurate general image of the periodontal status and integrate the periodontal disease in the systemic context, risk indicators information should be collected in order to elaborate an adequate and individualized treatment plan. A high BMI and masculine gender could have been important risk factors for severe chronic periodontitis in this study group.

Acknowledgement

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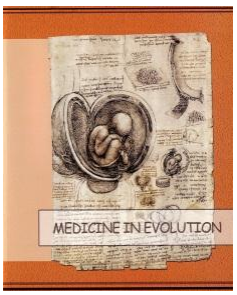
Retrospective study of mandible fractures complications



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Abstract

The etiology of facial trauma, especially of mandible fractures varies based on the multitude of existing cultures and societies. Mandible fractures have been studied for a long time without the possibility to formulate an ideal treatment approach that can prevent the occurrence of unexpected complications. Several factors need to be taken into consideration when a treatment is indicated, in such a matter that the complication incidence is reduced to minimum. The aim of the present study is to evaluate the incidence of mandible fractures complications, enrolling in the study a number of 30 patients that were treated in the Maxillofacial Surgery Clinic in Timisoara, during march 2014-october 2016. The inclusion criteria was the diagnosis of mandible fracture with or without any further complications and the results and conclusions of the study were based on the statistical analysis obtained using the programmes SPSS 16, Epi Info 6 and OpenEpi 3.01.

Keywords: Mandible fracture, complications, trauma, retrospective study, treatment.

INTRODUCTION

The fractures of the mandible represent one of the most frequent injuries in adults that are treated in the maxillofacial surgery. The explanation might be in the fact that the mandible is a proeminent, unsustained bone that belongs to the cranio-facial complex, without an effective support when it comes to excessive forces. The anatomy of the mandible describes the fact that it is formed by two hemimandibles that are united in the middle by a symphysis. Each hemimandible consists of a horizontal and a vertical ramus that unite at an angle. The condyle is the one that articulates to the glenoid fosa, forming in this way the temporomandibular join which represents a diarthroidal joint with two motion movements: rotation (around an horizontal axis) and a forward translation. The capsule of the joint contains a cartilaginous disc that can be displaced or ruptured when a condylar fracture occurs. Another region of interest is the alveolar rigde, that one part of the mandibular bone which sustains the teeth and consists of compact cortical bone.

When it comes to the blood supply and innervation, these are assured by the inferior alveolar artery and the innervation by the inferior alveolar nerve that enters at the mandibular foramen together with the artery, and traverses the medullar cavity below the level of the dental roots [1]. Also, there are two main groups of muscles inserted and involved in the mandible's movements: the masticatory muscles and the suprahyoid ones. Their involvement is upon the displacement of the segments that are fractured, the different forces of the muscles determining various degrees of mobility. The muscles of mastication tend to move the segments postero-superior, and the suprahyoid muscles displace the segments antero-inferior.

The incidence towards the mandibular fractures is very high and the prevalence rates that are reported by several studies show that the occurrence is between 60% and 81% [2]. The mandibular fractures are the most common type of facial fractures, with an arising incidence in the adult population. A high complication rate is associated with this type of trauma, oscillating from 5.4% to 36.8%, based on different studies [2, 3]. Infection is the most predominant posttraumatic complication, but the data varies considerably depending on ethno-social and geographical conditions [4]. The association between the risk of infection and the mandibular fractures is a fact, especially in the tooth-bearing area. The explanation regarding this issue is that these fractures are wide open and permanently exposed intraorally to an increased amount of bacteria.

Based on more studies, the major causes of the mandibular fractures were altercations (47.5%), from which automobile accidents (27.3%) and motorcycle accidents (4.2%), these representing one third of the fractures. The rest of the percentage regarding the causes of the mandibular fractures is grouped in four major categories: falls (7.1%), sport accidents (5.4%), work-related accidents (3.0%) and other causes (5.5%) [5].

Mandibular fractures represent two-thirds of all craniomaxillofacial fractures [6], with various locations of the fracture lines. According to a study performed by Stacey et al. [7], their conclusion was that the most encountered mandible fracture was that of the condylar process 36%, than that of the mandibular corpus 21% and of the mandibular angle 20%. Another study reveals the fact that physical altercations tend to produce a higher incidence of fractures located at the angle because a lateral blow of the mandible occurs, meanwhile the parasymphyseal, symphyseal, body and condylar fractures are more commonly associated with accidents [8]. The location of the fractures is also influenced by the age of the patients, sex and social provenience. Another important decision factor upon the necessary treatment is if the fractured segments are in position, or they suffered a displacement due to the different muscles insertions and actions. Based on this, if the fractures of the mandible are not adequate treated, they can cause a high risk of morbidity. The purpose of the treatment must provide a correct healing, taking care of the functional and cosmetic aspects also [9]. The

treatment that can be applied focuses on the possibilities in obtaining a full recovery, taking into consideration the local conditions (edentulous patient, open fracture, complete/incomplete fracture line). Complications are not completely ruled out from the final outcome of the treatment. During the decision of the treatment strategy, the age of the patient, the comorbidities, the trauma type and the localization of the fracture line are important definitory factors. The treatment can be either surgical (open treatment) using the internal fixation system or orthopedically with rigid-elastic intermaxillary fixation. The complications that can occur are divided into four categories: infection, non-union, malunion and temporomandibular joint ankylosis. Complications can occur whether the fractures are surgically or nonsurgically treated, and the incidence varies by local and general factors. Historically, rigid fixation of fractures was generally considered an unacceptable treatment because of the high associated complication rate [10].

Aim and objectives

The aim and objectives of this observational retrospective study are to evaluate the incidence and correlations of mandible fractures complications. These were analysed based on different factors such as: sex, age, type of fracture, localization of the fracture and type of the treatment. This study was based on an analysis of the cases that addressed the clinic during the period March 2014-October 2016.

Based on the fact that the mandible fractures have a high incidence upon the population, in this study the main objective is to identify the complication rates in the 30 cases of mandible fractures and their implications. The specific objectives are to establish the type of the complications and the correlation between with various variables (age, sex, type of fracture, type of treatment and localization of the fracture line). The identification of the existing relationships between different situations and their frequencies can help us provide a statistic analysis of this number of cases.

MATERIAL AND METHODS

In this study, a retrospective analysis was performed from a total of 30 cases of mandible fractures that were admitted in the Cranio-Maxillo-Facial Surgery Clinic from Timisoara, between the period March 2014 - October 2016. The patient's charts and records, operative reports and radiographies were analysed and the information included in the statistics. The type of study was a longitudinal one, based on the information provided by the charts, focusing on the representative variables: age, gender, type of fracture, type of complication and treatment. A quantification of the frequencies and percentages of the qualitative variables was performed, followed by a statistic comparison. The patients were introduced in a data basis created in Microsoft Excel 2010 *(Fig. 1)* with the following fields: patient number, gender, age, localization of the fracture line, type of fracture, complications and treatment. Some of the fields were subdivided as following:

- complications were divided into secondary (S) and late (T);
- the localization of the fracture line was subdivided into paramedian (PM), body (C), condyl (CD) and mandibular angle (U);
- the gender of the patients: male (M), female (F);
- the type of fracture: with displacement (D), without displacement (FD);
- the type of treatment: orthopaedic (O) and surgical (CH)

NR.	AGE	GENDER	TYPE OF FRACTURE	COMPLICATIONS	lOCALIZATION	TREATMENT
1	27	M	D	S	C	CH
2	31	M	D	-	C	CH
3	25	M	D	T	C	CH

NR.	AGE	GENDER	TYPE OF FRACTURE	COMPLICATIONS	lOCALIZATION	TREATMENT
4	36	M	D	S	PM	CH
5	42	M	D	-	U	CH
6	47	M	D	T	C	CH
7	48	F	D	T	C	CH
8	50	M	FD	S	C	O
9	29	M	D	-	C	CH
10	35	M	FD	-	PM	O
11	42	M	D	S	C	CH
12	55	M	D	S	C	CH
13	44	F	FD	-	U	O
14	10	M	FD	-	C	O
15	23	M	FD	-	CD	O
16	36	M	D	T	U	CH
17	48	M	D	T	C	CH
18	29	M	D	T	C	CH
19	51	F	FD	-	CD	O
20	13	M	FD	-	C	O
21	56	M	D	S	PM	CH
22	44	M	D	-	C	CH
23	22	M	FD	S	PM	O
24	52	M	FD	-	U	O
25	60	M	FD	S	PM	O
26	53	F	D	-	U	CH
27	40	M	D	T	C	CH
28	48	M	D	S	C	CH
29	39	M	D	-	C	CH
30	41	M	FD	-	U	O

Figure 1. The data basis organized based on the variables that will be analysed

The statistical analysis was performed on the file that was created, with the help of the programs: SPSS 17, EpiInfo 6 and OpenEpi 3.01 *(Fig.2, Fig.3)*. The analysis consisted of: the calculation of the frequences and percentages of the qualitative variables; the calculation of the arithmetic average and standard deviations for the quantitative variables; the statistic comparison of the average samples with the tests t-Student; the statistic comparison of the percentages with the Chi-squared test($\chi 2$ test); the statistical estimation of the results was made using the decision criteria of the statistical tests: $p>0.05$- unsignifiant difference (NS), $p<0.05$ – signifiant difference (S), $p<0.01$ – very signifiant difference (FS), $p<0.001$ – extreme signifiant difference (ES).

Statistics

		AGE	GENDER	TYPE OF FRACTURE	COMPLICATII
N	Valid	30	30	30	30
	Missing	0	0	0	0
	Mean	39,20			
	Median	41,50			
	Std. Deviation	12,724			
	Minimum	10			
	Maximum	60			

Figure 2.

Statistics

		LOCALIZATION	TREATMENT
N	Valid	30	30
	Missing	0	0

Figure 3.

RESULTS

After the analysis of the frequencies and percentages for the qualitative variables, the results show us that regarding the variable COMPLICATIONS, it resulted that secondary complication (infection) has a frequency of 30% (9 cases) and the late ones are found in 23,3% (7 cases), form the cases that were included in the study there were 14 cases that had no complications (46,7 %) *(Fig.4)*. The incidence of the fractures related to the AGE of the patient revealed the fact that the higher percentage, 76,6% (3 cases) occurred at the age of 48, and the lowest percentage (3,3%) at the age of 10 *(Fig.6)*. The statistical analysis based on the GENDER of the patient admit an increased percentage associated to males, 86,7% (26 cases), meanwhile the cases that involved females had a percentage of 13,3% (4 cases).

COMPLICATIONS

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	-	14	46,7	46,7	46,7
	S	9	30,0	30,0	76,7
	T	7	23,3	23,3	100,0
	Total	30	100,0	100,0	

Figure 4.

GENDER

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	F	4	13,3	13,3	13,3
	M	26	86,7	86,7	100,0
	Total	30	100,0	100,0	

Figure 5.

The type of treatment applied to the 30 cases included in the study was 63,3% (19 cases) a surgical one, and in 36,7% (11 cases) orthopaedic treatment *(Fig.6)*. Regarding the localization of the fracture line, it concluded that the fractures that were localized at the body had the higher percentage 56, 7% (17 cases), followed by those located at the angle of the mandible 20%(6 cases), the paramedian ones 16, 7%(5 cases), and the lowest percentage was associated to the ones located at the condyle 6, 7%(2 cases). The statistical comparison between the average samples using the t-Student test provided the percentage regarding the incidence of the secondary and late type of complications, associated with the existence of fractures with displacement and without displacement (*Fig.7*).

GENDER

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	F	4	13,3	13,3	13,3
	M	26	86,7	86,7	100,0
	Total	30	100,0	100,0	

Figure 7.

		D	FD	p
GENDER	M	17 (89,5)	9 (81,8)	0,8951
	F	2 (10,5)	2 (18,2)	-
COMPLICATION	S	6 (31,6)	3 (27,3)	0,4532
	T	7 (36,8)	-	
	-	6 (31,6)	8 (72,7)	0,3108
LOCALIZATION	C	14 (73,7)	3 (27,3)	0,5569
	CD	-	2 (18,2)	-
	PM	2 (10,5)	3 (27,3)	-
	U	3 (15,8)	3 (27,3)	-
TREATMENT	CH	19 (100)	-	-
	O	-	11 (100)	-
AGE	MEDIE	42	41	0,8607
	STD.DEVI	9,58	17.061	

Figure 6.

The secondary type of complications were more encountered in the cases of mandible fractures with displacement (31, 6% - 6 cases) than in the ones without displacement (27,3% - 3 cases). The late type of complications were associated only with the fractures with displacement (100% - 7 cases). The type of complications associated with the gender of the patients proved that 9 cases of secondary complications were male patients and 1 case of a late type of complication was a female patient (the secondary type of complications were not present in the cases included in this study).

DISCUSSIONS

The statistical analysis provides comprehensive information about the selected cases, correlating various variables to the incidence of the complications that can occur when mandible fractures are diagnosed. The limitation of this study is represented by the small number of the cases that were included, in comparison with other similar existing studies and the fact that the variable related to the presence of teeth in the fracture site was not documented. However, the results are similar to those encountered on our scientific research. Other publications reported also as the most frequent localizations of mandible fractures are the condyl, angulus, body and parasymphysis ones. This study also reveals the fact that infection was not detected in any of their patients during the follow up period [9]. Another study demonstrates that the most frequent complication in the mandible fracture cases that were enrolled in their research was infection, a secondary complication, represented by 32% of the cases. Also, other similar studies have shown the fact that the most associated complication with mandibular fractures is infection [10, 12]. Mainly, infections have minor consequences, but they can evolve to more significant complications including malunion, non-union, osteomyelitis and deformities of the bone. But, the infection rate found in a research says the fact that their research found that age and gender had no impact on postoperative infection rates [11], which in the present study implies existing differences. A closed reduction (orthopaedic treatment, intermaxillary fixation) had the lowest complication rate, fact that can be explained by the decision of this type of treatment that is an elective one for less complicated fractures.

This study showed the fact that the complication rate associated with mandible fractures remains a high one, especially associated with the open reduction type of treatment (surgical) than to the closed reduction one (orthopaedic treatment). The most encountered complications were the infections, frequently associated to the fractures that suffered a displacement of the fragments. According to more data, infection is the most posttraumatic complication and can be determined by a various range of conditions. A delayed medical care

can also be involved in the appearance of several complications, and seems to be the determinant factor for infection in mandibular fractures [13].

CONCLUSIONS

The conclusions that emerge from this study are based on the analysis of 30 mandibular fractures and the complications that were encountered. The statistical analysis assessed the fact that males are more exposed to mandible fractures and also the complications rate is higher in their case; the prevalence of the complication represented by infection is higher than other types of complications; infection was encountered in a higher percentage in association with fractures that had a displacement of the fragments; related to the fracture site, the higher incidence of complications was reported within the fractures that were localized at the body (corpus) of the mandible.

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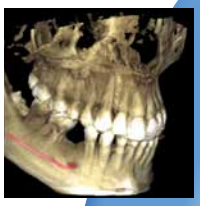

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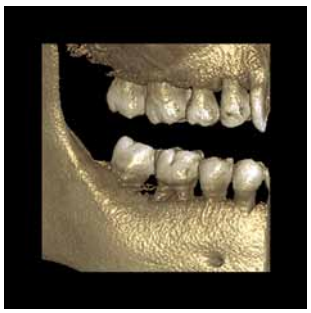

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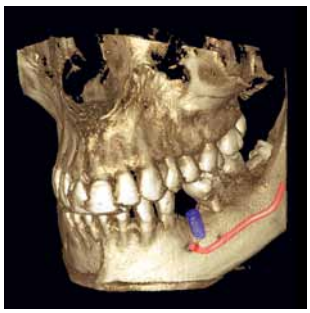
Ø42 x 42 mm–90 x 60 x 130 mm



Ø34 x 42 mm–140 x 105 x 130 mm

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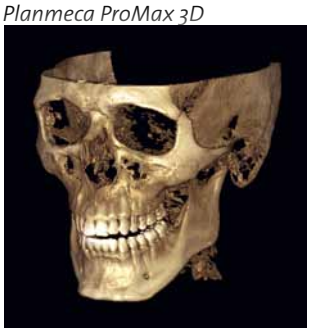

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INSTRUCTIONS FOR AUTHORS

The journal publishes general reviews, studies and clinical, epidemiological, experimental and laboratory research, clinical case presentation, papers from the history of medicine, reviews, scientific and technical state-of-the-art articles, medical informations and opinions. Only papers which have not been published or sent for publishing in other journals are accepted. The authors are responsable for the opinions expressed in the papers. ***The paper must be edited both in Romanian and in English; the English version will be supervised by our collaborator Dana Brehar-Cioflec, MD, PhD; typed on white A_4 paper and on CD, DVD or Memory Stick***.

Manuscripts will not exceed:

- general reviews: 6-8 pages
- studies and researches: 5-7 pages
- case presentations: 2-4 pages
- reviews, scientific and technical state-of-the-art articles, medical informations and opinions: 1-2 pages.

The paper will be edited according to international editing rules for manuscripts. The title will be written in capital characters and it will be followed by the name and surname of the author (authors), followed by their place of work (place where the paper has been elaborated). Studies and researches will be followed by a brief abstract, followed by 3-4 key-words.

The body of the paper will be structured on the following chapters: introduction, aim, objectives, material and method, results and discussions, conclusions. The references will be presented alphabetically and in conformity to the Vancouver Convention, including:

- for articles: name of the authors and surname initials, title of the article in the original language, title of the journal according to the international abreviation system, year of issue, volume, number, pages;
- for books: name of the authors and surname initials, volume, publisher (editors), city of publishing, year of issue.

Citation of references inside the body of the paper will be put between brackets, Harward style (author, year) or Vancouver style (number in square brackets or superscript). Cited reference titles will be selected, maximum 6 for studies and case presentations and 12 for general reviews. Acceptance, rejection or the need of alterations in sent materials, or in inconography, will be comunicated to the authors in due time. For this, the authors will indicate the person and address for corespondence (phone number, e-mail address). Given the less pleasant experience of the editorial board with some articles being rejected because they did not meet publishing criteria, we decided to support those who intend to publish in this journal by detailing the way such a paper should be elaborated, as well as our requirements.

Except some particular aspects concerning this journal, the following details are general requirements asked or imposed by other journals as well. Conditions to be met in order to propose a paper for publishing. The main author has the responsability to make sure the article has been approved by all the other authors. The journal will have copyright

for papers accepted for publishing. The editorial board reservs the right to change the style and dimensions of an article (major changes will be discussed with the main author) and to decide the date of issue.

2. FIRST PUBLICATION

The editorial board will not consider a paper already reported in a published general review or described in a paper proposed to or accepted by another journal. This does not exclude papers which have been rejected by other journals. Also, papers which have been presented at a scientific meeting will be accepted for discussion if they have not been entirely or partially published in a similar publication. „Multiple" publishing of the same study is seldom justified. One of the possible justifications is publishing in a second language but only if the following conditions are met:

- Editors of both journals involved are fully informed;
- Priority of the initial publication will be respected by a minimum publishing interval of two weeks;
- For the second publication, a shortened version will suffice;
- The second version strictly reflects data and interpretations in the first;
- A footnote may state: „This article is based upon a study initially published in [title of the journal]".

3. PATERNITY

Paternity must reflect the common decision of the coauthors. Each author must have participated enough to take public responsability for the content. A paper with collective paternity must have a key person responsable for the article.

4. COPYRIGHT

In order to reproduce materials from other sources, written agreement from the copyright owner must be obtained:

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- hospital where the photographer (physician) is employed – for unpublished photographs performed during the employment period;
- initial publisher – for a table, picture or text which have previously been published elsewhere.

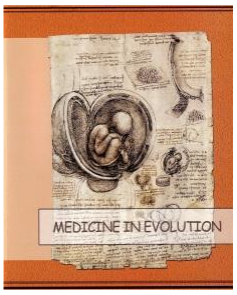
5. ETHICAL ASPECTS

Do not use name of patients, initials or hospital observation charts numbers. If a photograph of a body part which could allow direct or deductive recognition of the patient needs publishing, then the paper must be accompanied by the written consent of the patient and clinician, as well.

6. PRESENTING THE MANUSCRIPT

6.1. CONTENT OF THE PAPER - INDICATIONS FOR ORIGINAL ARTICLES

Paper title [Book Antiqua 20, bold, left alignment]



Surname N.[1], Surname N.[2] [Book Antiqua, 14, bold]

[1] *Author Affiliation (DEPARTMENT, FACULTY, UNIVERSITY, CITY/COMPANY) [10, italic]*
[2] *Author Affiliation (DEPARTMENT, FACULTY, UNIVERSITY, CITY/COMPANY) [10, italic]*

Correspondence to:
Surname Name: [10, italic]
Address: [10, italic]
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Abstract [Book Antiqua, 12, bold, justify alignment]

Recommendations for original studies

Original studies must include a structured abstarct of maximum 150 words, containing the following titles and informations: Aim and objectives; Material and methods; Results; Conclusions; Key words: give 3-5 key words; The abstract will be translated into an international circulation language.

Keywords: Innovation, technology, research projects, etc. [Book Antiqua 9].

INTRODUCTION [Book Antiqua, 11, bold, left alignment]

Introduction presentation of general aspects, in the context of the approached theme.

Introduction include **Aim and objectives –** Define the aim of the article. Briefly expose the rationale of the presented study or observation. Make strictly pertinent referals and do not exhaustively review the subject. Do not include data or conclusions from the paper.

There is a limitation of 4/6 pages. All pages size should be A4 (21 x 29,7cm). The top margins should be 2 cm, the bottom, right, margins should be 2cm and left margins should be 2,85 cm. All the text must be in one column and Book Antiqua font, including figures and tables, with single-spaced 10-point interline spacing.

Aim and objectives **[Book Antiqua 11, bold italic, left alignment]**

The text included in the sections or subsections must begin one line after the section or subsection title. Do not use hard tabs and limit the use of hard returns to one return at the end of a paragraph. Please, do not number manually the sections and subsections; the template will do it automatically.

[Book Antiqua, 11 point, normal, justified alignment].

MATERIAL AND METHODS [Book Antiqua, 11, bold, left alignment]

Describe the selection of observations or subjects for the experiment (including controls). Identify methods, equipments (with the name and address of the manufacturer in brackets) and give sufficient details on procedures. Give references for the selected methods, including statistical methods; offer details and brief descriptions for previously published methods which are not well known; describe new or substantially modified methods, justify their use and assess their limitations. Precisely identify all used drugs and chemicals, including generic names, dosage and administration ways. Describe statistical methods with sufficient details for reported results to be verified. Whenever possible, quantify discovered aspects and present them with appropriate measurement indicators for the uncertainty or error of measurement (such as confidence intervals). [Book Antiqua, 11 point, normal, justified alignment].

RESULTS [Book Antiqua, 11, bold, left alignment]

Present results in a logical succession as text, tables and illustrations. Emphasize or briefly describe only important observations. [Book Antiqua, 11 point, normal, justified alignment].

DISCUSSIONS [Book Antiqua, 11, bold, left alignment]

Underline new, important aspects of the study. Do not repeat in detail data which have been presented in previous sections. Include implications of revealed aspects and their limitations, including implications for future studies. Connect your observations to other relevant studies. Relate the results to the aim proposed for the study. [Book Antiqua, 11 point, normal, justified alignment].

CONCLUSIONS [Book Antiqua, 11, bold, left alignment]

Organize conclusions which emerge from the study. In the end state: a) contributions to be acknowledged but which do not justify paternity right; b) thanks for technical support;

c) thanks for financial or material support. [Book Antiqua, 11 point, normal, justified alignment].

REFERENCES [Book Antiqua, 11, bold, left alignment]

A numbered list of references must be provided at the end of the paper. The list should be arranged in the order of citation in the text of the publication, assignment or essay, not in alphabetical order(according to the Vancouver rules). List only one reference per reference number. It is very important that you use the correct punctuation and that the order of details in the references is also correct.

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[1] _____
[2] _____
[3] _____

6.2. CONTENT OF THE PAPER - INDICATIONS FOR CASE REPORTS

Content of the paper for case report will respect indications for original articles.

Themes may be selected from all medical fields. Manuscripts which offer a special gain for daily activity will have priority. The title must be clearly, precisely stated. It may be completed by a subtitle. It is advisable to include in the key words of the title the main message, the special element which may be observed from the case evolution. The content of a case report must be divided into three parts:

Introduction – It must include a maximum of 15 typed rows (half page). Here, the main medical problem is summarized in order to place the case in a specific domain.

Case report – It contains essential specific information on the case. In order to make a logical, chronological and didactical case report the following 5 chapters are needed:

I. Anamnesis;
II. Clinical examination data;
III. Laboratory data;
IV. Additional paraclinical investigations;
V. Treatment and evolution.

Discussions – The reason for the case report must be stated. The report must be patient-centered. Occasional deviations from typical (characteristic) evolutions, nosologically important facts must be presented in such a manner to expose the clinical picture as completely as possible. The case report must not appear as an appendix of a general review. Dimensions of a case report: maximum 6-8 typed pages, 30 rows of 60 characters/page.

6.3. MEASUREMENT UNITS, SYMBOLS, ABREVIATIONS

All measurements must be expressed in International System (IS) units. Abreviations must be fully explained when first used.

6.4. TABLES

Tables are noted with Roman figures and they will have a brief and concise title, concordant with their content.

6.5. ILLUSTRATIONS

Number all illustrations in Arabic figures in a single succession. Apply a label on the back side of every illustration, containing its number and an arrow indicating the upper side. Coloured illustrations may be accepted but it is the choice of the editors, according to particular technical abilities of each journal issue, or it may involve a fee in special cases.

6.6. EXPLANATIONS FOR DRAWINGS AND GRAPHS

Explanation for drawings and graphs must be clear and in readable dimensions, considering the necessary publishing shrinkage.

6.7. PHOTOGRAPHS

Offer glossy, good quality photographs. Any annotation, inscription, etc. must contrast with the ground. Microphotographs must include a scale marker.

6.8. ILLUSTRATION LEGENDS

Include explanations for each used symbol, etc. Identify the printing method for microphotographs.

7. COPIES FOR PUBLISHING

In order to accelerate publishing, the main author will send a set of printed sheets presenting the final version of the paper, as it will appear in the journal. It is really helpful that texts to be also sent on electronic support, diacritic characters mandatory.

8. REJECTION OF PAPERS

If a paper does not meet publishing conditions, whatever these may be, the editors will notify the first author on this fact, without the obligation of returning the material. Original photographs or the whole material will be returned only if the author comes to the editor and takes them.

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