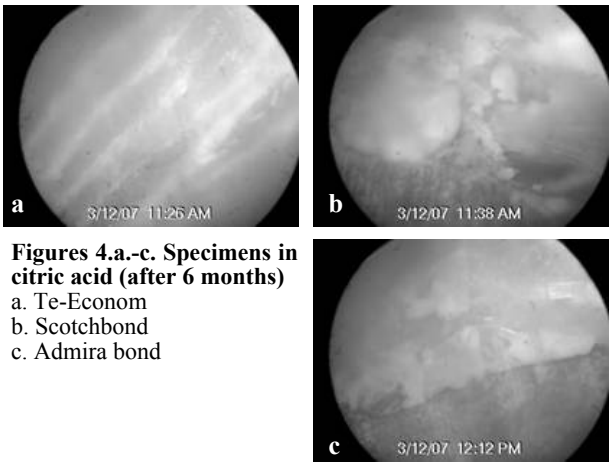

Figures 4.a.-c. Specimens in citric acid (after 6 months)
a. Te-Econom
b. Scotchbond
c. Admira bond

the incorporation of fiber-reinforced materials to replace metal splints. These contemporary materials provide increased flexural strength, as well as improved aesthetic.

Conclusions

Internal fiber-reinforced composite splinting being affordable for the patient, easy for the clinician to construct and giving good esthetic and functional results, suggests that the method may be a valuable aid in periodontal treatment.

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ЭКСПЕРИМЕНТАЛЬНЫЕ ИССЛЕДОВАНИЯ ТРЁХ АДГЕЗИВНЫХ СИСТЕМ ИССПОЛЬЗУЕМЫХ ДЛЯ ИМОБИЛИЗАЦИИ ЗУБОВ ПРИ ПАРОДОНТАЛЬНЫХ ЗАБОЛЕВАНИЯХ

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Аннотация:

В этой работе исследуются с помощью электронной микроскопии три адгезивные системы для фиксации временных шин из стекло-волокна (fiberglass-reinforced splint system), исспользуемых для имобилизации передних зубов в пародонтальных заболеваниях. Электронно-микроскопические изображения показывают значительные различия в качестве адгезии в зависимости от типа адгезионной системы и от прошедшего времени. Самые лудшие результаты показали система Admira Bond и Scotchbond, а самый слабый Te Econot. Результаты работы демонстрируют, что этот метод имобилизации который использует для фиксации композит и адгезивные системы можно исспользовать с успехом в пародонтологии для имобилизации небольших размеров и при высоких эстетических требованиях.

Ключевые слова:

имобилизация, стекло-волокно, адгезивные система

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INVESTIGATIONS REGARDING THE PRESENCE OF PULP MINERALIZATIONS AT DIFFERENT AGES

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Abstract:

The aim of this study was to make a comparative evaluation regarding the frequence of the pulp stones appearance in two groups of patients : a young group, between 18-35 years old, and a second one, aged between 60-80 years old. The analysis was made considering the action in time of the irritating factors upon some of the teeth, who developped irreversible pulpo-dentinal changes. The results obtained after the clinical , radiographic and hystological exams leaded to a stastistic evaluation which allowed the differentiation between the two groups of age, pointing out the characteristics of each one .

Key words:

pulp tissue, mineralization, pulp stones

Introduction.

It is well known the fact that the dental pulp can be affected by many intern or extern factors that are capable of causing certain injuries, more or less severe, depending on their aggressive internal or external action upon the pulp tissue.

One of the ways pulp reacts to these stimuli can consist in the apparition of mineralization processes under different forms. They can range from the tertiary or reaction dentin, the diffuse calcifications along the blood vessels or connective fibers, to the formation of the big, voluminous concentrations of minerals that constitute the pulp stones or the denticles. The apparition of such phenomenon takes place slowly, in time, and is not accompanied by obvious symptoms, aspect which makes them difficult to be discovered. The only way they are likely to be detected is the histological exam, or, if they are voluminous enough, the radiological exam.

The ethyology of pulp calcifications is yet unknown [2,7] but there are some theories which claim that the prolonged action of some irritative factors on the pulp tissue would generate obvious mineralization reactions in some fragments of the pulp. For this reason, it is believed that this phenomenon is a specific feature of the old age [12]. This aspect is

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disputed by other authors [4] who consider that at least 50% from all the teeth have different forms of pulp calcifications, showing that these can appear even in children. A plausible explanation, promoted by the Finnish researchers Olavi Kajander and Neva Ciftcioglu, from the Kuopio University (2001), would be that there is a microorganism, called Nanobacterium Sanguineum, that would initiate these mineralizations in the pulp or in other places in organism, affirmation which was not confirmed though by other authors, also.

Our research tries to evaluate the presence of these calcifications, especially in the shape of pulp stones, in order to establish the percentage of their appearance in young, versus old patients.

Table I.

Factors that induce modifications in the pulpal-dentinal structure

Subjects	Decays	Obturations	Periodontal pockets	Abrasions
Group I (18-35 years) 120 subjects F: 56, M: 64	71 sub.(59.1%) F: 28(39.4%) M: 43(60.5%)	67 sub.(55.8%) F: 30(44.7%) M: 37(55.2%)	12 sub.(10%) F: 4(33.3%) M: 8(66.6%)	15 sub.(12.5%) F: 6(40%) M: 9(60%)
Group I: p-values: females vs. males	p=0.062* ns	p=0.074* ns	p=0.042*	p=0.069* ns
Group II (60-80 years) 150 subjects F: 69, M 81	62 sub.(41.3%) F: 23(37.1%) M: 39(62.9%)	115 sub.(76.6%) F: 55(47.8%) M: 60(52.2%)	78 sub.(52%) F: 32(41%) M: 46(59%)	128 sub.(85.3%) F: 58(45.3%) M: 70(54.7%)
Group II: p-values: females vs. males	p=0.052* ns	p=0.079* ns	p=0.065* ns	p=0.074* ns
Total 270 sub p-values Group I vs. Group II	**133 sub (49.2%)** p=0.071* ns	**182 sub (67.4%)** p=0.038*	**90 sub (33.3%)** p=0.028*	**143 sub (52.9%)** p=0.0084*

*p-value will be greater than 0.05 result is not statistically significant, 95% confidence interval - McNemar's test

Materials and methods.

Our study was realized by clinical and radiological random examination of 270 patients, divided in two groups: one of 120 young patients aged between 18 and 35 years old, and a second group, between 60 and 80 years old, in which was followed the presence of the mineralization zones, after the influence of the irritation factors that had a longtime action on some of the teeth.

In cases where pulp extirpation or tooth extraction were necessary, pulp tissue prelevations were also realized for the histological exam, in order to outline the pulp structural changes. From the wide range of irritating factors that can affect the teeth, we focused on the ones most frequently met: decays, dental abrasion, periodontal pockets and obturations.

Differences between incident cases were tested for statistical significance using Chi-square tests (for categorical dependent variable).

Results and Discussion.

At a first examination it is obvious (Table I), that the decays and the obturations are present mostly in young patients, while in the older group the abrasion and the periodontal pockets are the most frequently met (Graphic I).

The differentiation by gender is not significant (p>0.05), although a slightly raised frequency of the pulpal-dentinal changes is found in men teeth (p=0.042). The radiologic exams of the analyzed subjects showed a range of big, mineralized features occupying a significant part of the pulp chamber volume, following the long-time action of the irritating factors previously mentioned. It has been also observed a narrowing of the endodontic space fallowing the reaction dentin deposition on the walls of the pulp chamber, as well as of the radicular space. Although the frequency of these manifestations is significantly higher in older patients (p<0.05, Table I), sporadically they can be met in young people, too.

The histological sections from the pulp of the extracted or devitalized teeth have shown the presence of diffuse mineralization, more or less extended in the tissue.

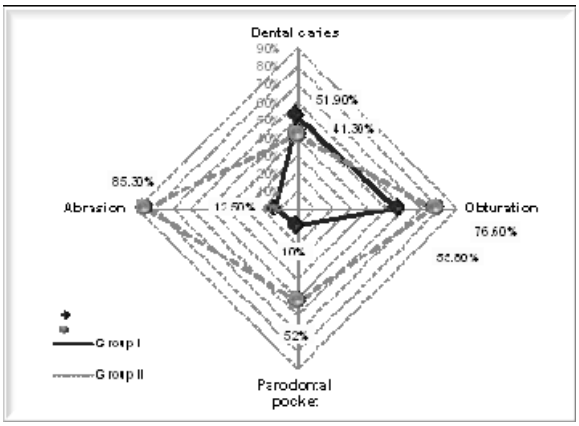
As shown in Table II, the presence of some pulp stones found in the two groups reveals significant differences between the young and old patients.

In the young patients group, only two pulp stones were identified, that is 1.6% of all mineralizations, while in the old group, 16 pulp stones were found, which means 10, 6%

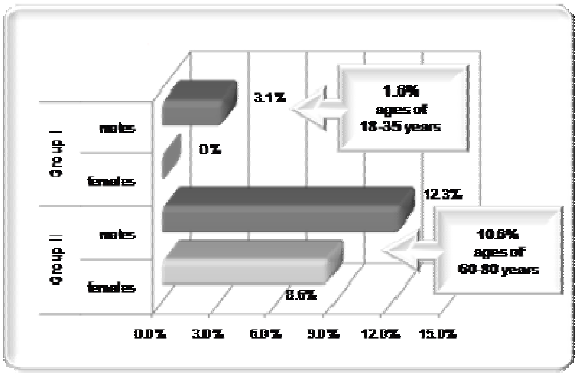
Table II.

The prezence of the pulp stones in the young and old patients groups

Total examined subjects– 270		Teeth examined				Percentage	Total
		I	C	P	M		
Group I	F - 56	0	0	0	0	0 %	18 pulp stones (6,5 %)
	M - 64	0	0	0	2	3,1 %	
Group II	F - 69	1	0	0	5	8,6 %	
	M - 81	1	0	1	8	12,3 %	



Graphic I



Graphic II

from the examined subjects (Graphic II).

By groups of teeth, the most affected were the molars, especially the first molars, aspect which is also mentioned in the literature. The fact that the pulp stones were found mostly in old than in young patients can be explained by the fact that the formers have been submitted to the action of the irritating factors, on the dental arcades, a longer period of time.

Our data is, of course, relative, considering that only the most voluminous pulp stones can be seen on the radiographs (fig. 1,2) and not the lesser ones in evolution, or the diffuse mineralizations. The last ones were accidentally discovered on the histological slides, at the microscope (fig. 3, 4)

The diffuse calcifications are calcium octophosphate crystals, in the shape of concretions of various dimensions, ranging from the size of a sand grain, or thin, tiny chips along the collagen fibers, blood vessels, or nerve's myelin sheath (fig.5), to the size of little globulous stones disseminated through various areas.

Another interesting aspect observed refers to the tooth vitality. Most of the cases with calcifications were found in non vital teeth, fallowing long carious processes evolving to septic necrosis, although their apparition and formation took place in a vital pulp, affected in time by different harmful factors.

Many authorized researchers [2,7,14,15], consider that the circulatory problems can lead to dystrophic modifications like mineralization, or assume that the calcification's core would evolve around some degraded cells (plasmocytes), blood thrombi, or even collagen fibers. It is well known that the degraded cells alkalinity attracts the mineral salts.

Conclusions:

⇒ The presence of the mineralized tissue at the pulp level can be met at all ages, especially in old people.

⇒ The identification of these features is usually made by accident, due to the lack of a certain simptomathology.

⇒ The first molars are more frequently involved.

⇒ The etiological factors and the mechanism of pulp stones formation, not completely elucidated yet, require numerous further investigations.

Fig.1 Radiographic image of a big pulp stone in the pulp chamber of the first molar

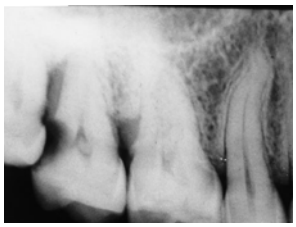


Fig.2 Radiographic appearance of a pulp stone in the pulp chamber of the second molar

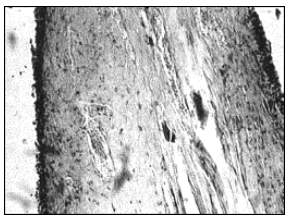


Fig.3 Dental pulp fragment with a debut of mineralization along the blood vessels

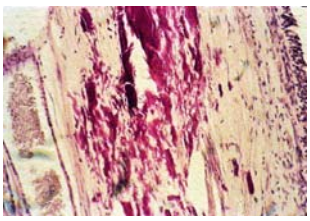


Fig.4 Dental pulp fragment with a diffuse mineralization process

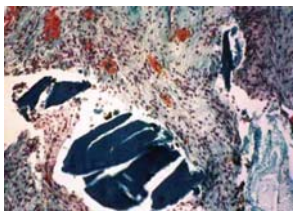


Fig.5 Future pulp stones in evolution, globulous or chips-like in shape

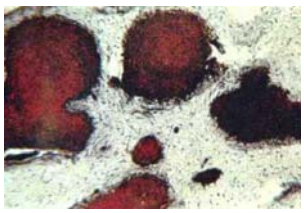


Fig.6 Pulp stones in different stages of evolution

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ИССЛЕДОВАНИЕ МИНЕРАЛЬНЫХ ОТЛОЖЕНИЙ НА УРОВНЕ ПУЛЬПЫ В ЗАВИСИМОСТИ ОТ ВОЗРАСТА И ВОЗДЕЙСТВИЯ ИРИТАЦИОННЫХ ФАКТОРОВ

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Аннотация:

Цель этого исследования установить и показать частоту формирования пулполитов (pulpstone) в эндодонтии, изучив различия и характерные изменения на двух групах субъектов, возрастом 18-35 и 60-80 лет и присутсвие локальных иритативных факторов, которые могут вызвать эти элементы на уровне пульпы и дентина. Анализ был произведён осмотром клинических и радиологических изменений, а также присутствием модификаций на гистологических препаратах на удалённых зубах. Статистическая интерпретация позволила определить различия между групами на которых проводилось исследование и установить их характерные изменения.

Ключевые слова:

пулполиты, иритативный фактор, пульпа и дентин