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Histological Analysis of Radicular Dental Calcifications According to the Size

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Abstract: ***Introduction: The intention of the study is to present morphology dental calcifications according to: the size. Materials and Methods: The present study was analyzed 60 extirpated pulps of teeth with endodontic diagnosis pulpitis chronic, and 40 pulps of extracted teeth, with the method of light microscopy, and by using standard differential histochemical stain. Results: The results obtained from the carried out examinations showed: the findings show values smaller than 1 micron, up to 1cm, measured per samples with continuous areas of calcifications which fill in almost the whole pulp, in a longitudinal direction. The transverse section is within the limits of 20 to 200 microns, whereas the longitudinal section is up to 500 microns. Conclusion: With this study are confirm that regarding the size, calcifications show a wide range of variations.***

Keywords: dental calcifications**,** morphology, the size, longitudinal direction, transverse section, standard differential histochemical stain, light microscopy.

1. Introduction

According radiographic analysis of the coronal dental calcifications or dental pulp stones - more often occur with molars – more often with the upper first molars than with the premolars and the incisive teeth [1].

Greater percentage of denticles occurs with teeth in the maxilla rather than with the teeth in the mandibula, the exception to which are the incisive teeth which have more often occurrence with the mandibula [1]. The percentage of occurrence of denticles perceived per gender shows that these occur more with the males rather than with the females, in both the maxilla and the mandibula [2].

The comparison of teeth which are with caries or are restored, when compared to the intact teeth shows that the denticles more often occur with the teeth with caries i.e. with the restored teeth, and they have more rare occurrence with the non-restored teeth [1].

According histological analysis of radicular dental calcifications structural features showed a morphological picture similar to the one of the dentin structure, lamellarly-concentric and calcifications with small granular structure [3]. Calcifications with morphological features similar to the structure of dentin show greater affinity to eosin i.e. get coloured in intense red, unlike the other two groups of calcifications, which further implies that there is a greater quantity of organic matrix in them.

Calcifications with lamellar concentric structure are spherical at shape. They are nodules similar in size as the previous ones. These calcifications get more intensively coloured with haematoxylin i.e. they show more intensive basophilia unlike the denticles.

Calcifications with granulated small granular structure. Common for all the calcifications that belong to this group is the intensive colouring with hematoxylin i.e. the basophilic colouring which implies that there is the greatest presence of calcium salts in them when compared to the previous two groups. The organic matrix is maximum reduced, so that after the decalcination phase it becomes transparent and in some places it appears to be missing; it is there where empty cracked and lacunar spaces are formed [3].

2. Material and Method

Material for the purpose of histological examination was provided with endodontic extirpation and vertical section during indicated teeth extraction; the material consisted of -- extirpated vital pulp of teeth with chronic diseases; -- pulp of extracted teeth with chronic diseases. Teeth were being cured in endodontic manner up to their final opturation.

Histological analysis was made on the pulp of 40 extracted teeth with pulpitis chronica. Distribution of pulp of extracted teeth with pulpitis chronica: (Table 1). 60 extirpated pulps of teeth with pulpitis chronica were sent to histopathological analysis (Table 2).

Table 1: Distribution of pulp of extracted teeth with pulpitis chronica

Side				Left						Right						
Tooth	8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8
maxila	1	2	2	2	2			1	1		1	1	1	2	1	
mandibula		2	2		2	1		2	2	1	1		1	3	4	2

Table 2: Distribution of extirpated pulps of teeth with pulpitis chronic

Side	Left								Right							
Tooth	8	7	6	5	4	3	2	1	1	2	3	4	5	6	7	8
maxila		2	2	3	2	4	1	2	8	4	2		2	3		
mandibula	2	1	3	2		2	3	2	6	2		2			1	

For the purpose of histological processing there was used various different methods and procedures such as: fixation, decalcination, tissue processing, provision of paraffin sections, standard colouring, differential colouring,

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microscoping and morphological analysis with photographing.

3. Results and Discussion

Regarding the size, calcifications show a wide range of variations. The findings show values smaller than 1 micron, up to 1cm measured per sample, with continuous areas of calcifications which fill in almost the whole pulp, in a longitudinal direction. The transverse section is within the limits of 20 to 200 microns, whereas the longitudinal section is up to 500 microns.



Figure 1: HE colouring (magnify.10x4) formations of decalcified spherical pulp stones, dentinal composition

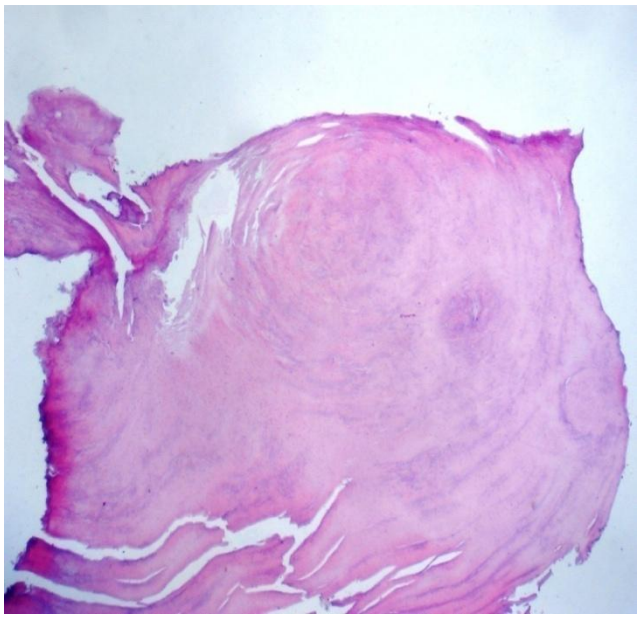


Figure 2: HE colouring (magnify.10x4) formation of decalcified spherical pulp stones, dentinal composition

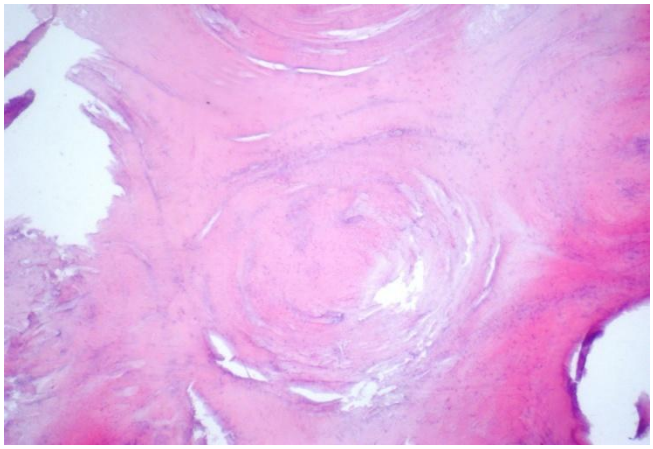


Figure 3: HE colouring (magnify.10x10) formations of decalcified spherical pulp stones, dentinal composition, dentinal tubules itself partially with radial disposition, partially with anarchic disposition

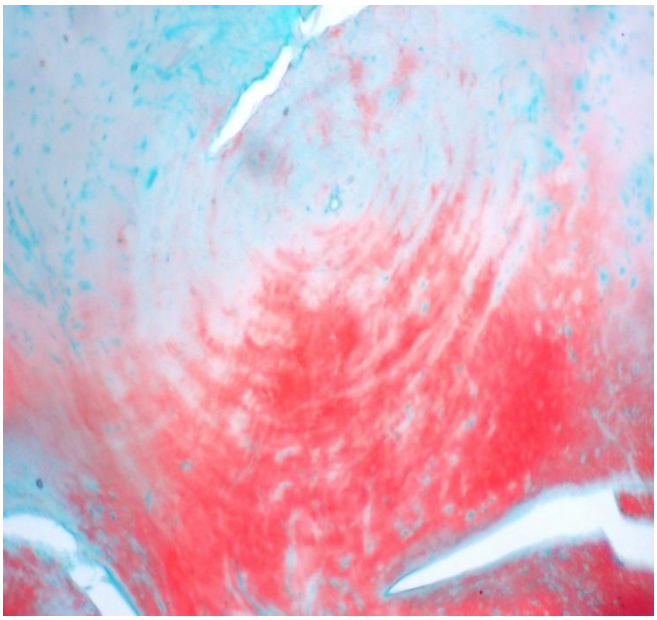


Figure 4: Masson trichrom colouring (magnify. 10x20) – of the figure is visuelisation ratio of predentin and dentin, predentin colouring green, ripe dentin colouring red

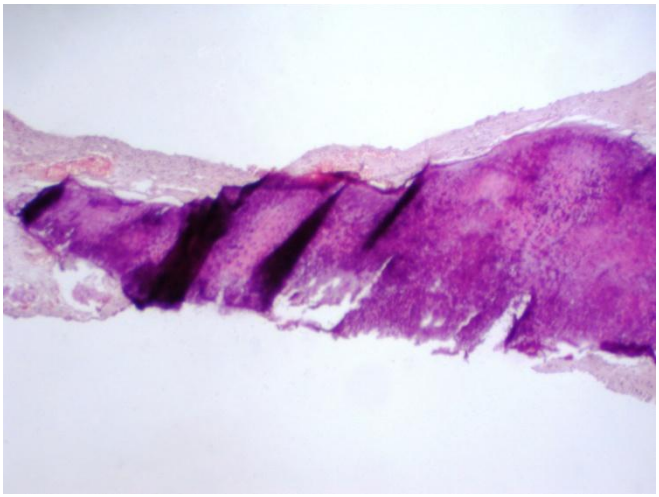


Figure 5: Colouring according to HE, zoom of 10 x 4, formation of dental calcification, denticle with fine granulated structure, the size of which being such to occupy

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the pulp almost across all its width and along its length. Visible congested blood vessels

Literature is rich with descriptions of dental calcifications. The greatest attention is paid to the prevalence of denticles. Pulp stone was seen more often in the 41-50 years age band, in molars and in teeth with chronic periodontitis but less often in teeth with abrasion. In addition, coronal and free form of pulp stone were more popular [4]. The incidence of pulp stones was found to be 15% in a Turkish population [5]. The studies on the structure, the composition and the size are not in a large number [6], which leaves available the possibility to make tries to define it in a more accessible manner, as an opportunity to clarify this dental entity which is present in the everyday casuistics, but does not appear to always be detected.

Structurally, pulp stones can be classified as true or false, the former being made of dentine and lined by odontoblasts, whereas false pulp stones are formed from degenerating cells of the pulp that gets mineralized [7]. According to Smith There is a continuous deposition of secondary dentine throughout the life of the pulp which generally reduces the volume of the pulp and the root canals. Secondary dentine is deposited at a rate of approximately 1-16 microns per day [8]. Structural changes with age include a decrease in the number of blood vessels,4 nerves5 and pulpal cells with an increase in fibrous components [9]. In posterior teeth, there is an asymmetric deposition of secondary dentine with the greatest increase on the floor of the pulp chamber, leaving the horns of the pulp behind [10]. In anterior teeth most of the dentine deposition occurs on the lingual wall of the pulp chambers as a direct result of masticatory forces, followed by deposition on the incisal floor of the pulp chamber [11].

Robbins LS. In year 1979 divided the dental calcifications into: pulp stones and diffused calcifications. Both types of calcifying bodies in the dental pulp are described by Moss Salentijn and Klyvert in year 1983. According to them, denticles according to their structure are divided into: real and false denticles. According to these authors, there exists another histological division i.e. denticles that have central gap which is filled with epithelial remains, wrapped up peripherally with odontoblasts and pulp stones wrapped up with compact degenerative masses of calcified tissues.
With this study are confirm that regarding the size, calcifications show a wide range of variations [7].

4. Conclusions

With this study are confirm that regarding the size, calcifications show a wide range of variations.

References

[1] Aleksova P. Dental calcifications-reason for special analysis. Master's Degree Paper (MD Paper), 2006; 1: 62-67.
[2] Aleksova P., Matovska Lj., Ambarkova V. Occurencedental calcifications according to the patients sex. 13-th Congress of the Balkan Stomatological Society, 2008; Book of abstract: 166.
[3] Aleksova P., Gorgova J., Velevski D., Velevska-Stefkovska D. Analysis of the dental calcifications according to the structure. Balkan Journal of Stomatology 2013; 17:144-148.
[4] Cl Udoye, MA Sede. Prevalence and Analysis of Factors Related to Ooccurrence of Pulp Stone in Adult Restorative Patients. Ann Med Health Sci Res. 2011 Jan-Jun; 1(1): 9–14.
[5] Yildirai Sisman, Ali M. Aktan, Elif Tarim-Ertas, Mehmet E. Ciftci, Ahmed E Sekerci. The prevalence of pulp stones in a Turkish population. A radiographic survey. Med Oral Patol Oral Cir Bucal. 2012 Mar; 17(2): e212–e217.
[6] Hussein I., Uthman AA. An unusual calcification of the pulp : A case report. J Endodon , 1982; 8: 33 – 4.
[7] R. Goga , N. P. Chandler, A. O. Oginni. Pulp stones: a review. 2008 International Endodontic Journal, , 41, 457–468.
[8] Smith AJ. Dentin Formation and Repair. In Seltzer and Bender eds : Dental Pulp. Quintessence Publishing Co. Inc, 2002.
[9] Andreasen JO, LØvschall H. Response of oral tissues to trauma. In: Textbook and Color Atlas of Traumatic Injuries to the Teeth, 4th ed. Blackwell Publishing Company, Oxford, UK.
[10] Berkovitz BKB, Holland GR, Moxham BJ. In: Oral Anatomy, Histology and Embryology, 4th Edition, 2009, Mosby. 11. Pashley, DH, Walton RE, Slavkin HC. Histology and physiology.
[11] Tidmarsh BG. Micromorphology of molar pulp chambers [abstract]. J Dent Res 1979;59:1873.

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