

Analysis of Radicular Dental Calcifications According to the Shape

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Abstract: Introduction: Dental calcifications, known as denticles, are mineral deposits in the coronal and radicular pulp tissue. They are a sort of discrete calcification bodies with definite but very different location, prevalence and histology. The intention of the study is to present morphology of dental calcifications according to: the shape. 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: According to shape, 2 groups are identified. The first group consists of calcifications of oval shape, which have a degree of bending similar to circle or spherical objects; these calcifications are nodular. The second group of calcifications consists of calcifications which are of irregular shape, corner-like, except the bigger ones, which are relatively elongated. Conclusion: With this study are confirm that regarding the shape, radicular calcifications can be oval or spherical, and irregular shape.

Keywords: the shape, radicular calcifications, morphology, light microscopy, longitudinal direction, transverse section, standard differential histochemical stain.

1. Introduction

The current picture of the process of biological calcifications portrays the cells within the calcifying tissues as central factors controlling the deposition of mineral crystals in the extracellular matrix. The cell responds to hormones and second messengers, and other changes in its environment, regulating the concentration of ions within the extracellular matrix and secreting macromolecules whose properties determine the ability of the matrix to be calcified [1].

Observations portray calcification processes as similar whether occurring normally or pathologically. Most forms of calcification are initiated by membranous organelles, i.e. extracellular, calcifying "matrix vesicles" or intracellular mitochondria. Matrix vesicles promote calcification through calcium-binding phospholipids and phosphatase activity [2]. Pathologic calcification usually is initiated by the biologic membranes of mitochondria or matrix vesicles. Mitochondria frequently initiate intracellular calcification [3].

Dental calcification is part from whole pathologic calcification in organism. She is with different location, prevalence and histology.

Histological analysis of radicular dental calcifications according the size showed 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 [4].

Regarding the composition dental calcifications can be classified such: dentinal and non-dentinal. The dentinal calcifications are spherical, nodular, solitary and more numerous, they contain greater amount of organic matrix, they occur at early age and have hamartomatous aspect.

The non-dentinal calcifications could be nodular spherical, irregular in shape or with punctform encrustations. They contain smaller amount of organic matrix, they occur in the middle or older age and have inflammatory dystrophic background [5].

2. Material and Method

Material for 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 and pulp of extracted teeth with chronic diseases with the method of light microscopy, and by using standard differential histochemical stain.

Histological analysis was made on the pulp of 60 extirpated pulps of teeth with pulpitis chronica (Table 1), and 40 extracted teeth with pulpitis chronica (Table 2).

Table 1: Distribution of 60 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
Maxilla		2	2	3	2	4	1	2	8	4	2		2	3		
Mandibula	2	1	3	2		2	3	2	6	2		2				

Table 2: Distribution of pulp of 40 extracted teeth with pulpitis chronic

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

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, microscoping and morphological analysis with photographing.

3. Results and Discussion

Regarding the shape, 2 groups are identified. The first group consists of calcifications of oval shape, which have a degree of bending similar to circle or spherical objects; these calcifications are nodular (Figure 1,2,3,4,5).

The second group of calcifications consists of calcifications which are of irregular shape (Figure 6) , corner-like, except the bigger ones, which are relatively elongated (figure 7).

Oval or spherical shape of dental radicular calcifications

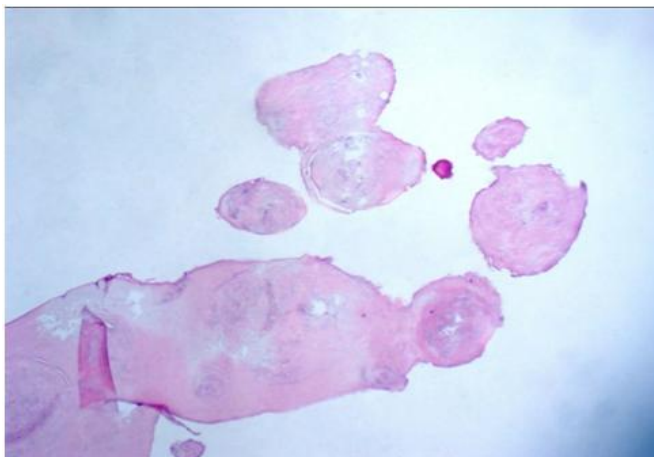


Figure 1: HE colouring (magnify.10x4) formations of decalcified spherical pulp stones

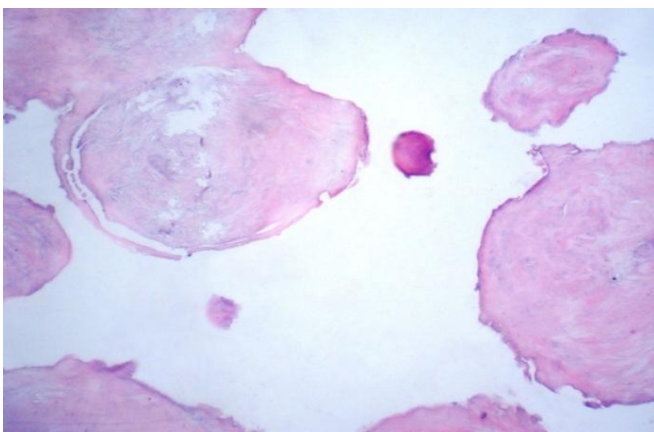


Figure 2: HE staining (magnify.10x10), formations of decalcified spherical pulp stones

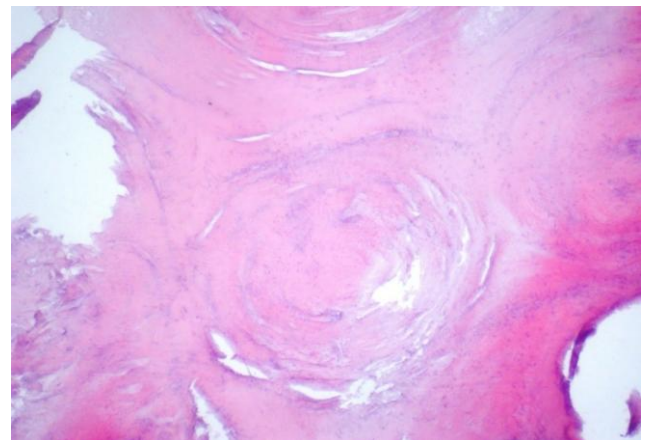


Figure 3: HE colouring (magnify.10x10) formations of decalcified spherical pulp stones, dentinal tubules itself partially with radial disposition, partially with anarchic disposition

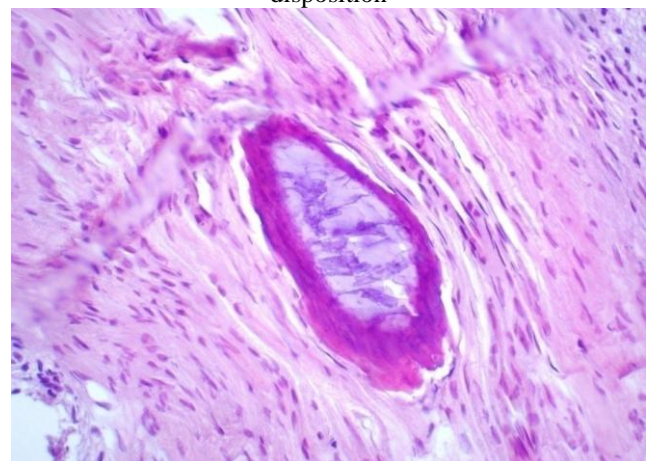


Figure 4: HE staining, (magnify. 10 x 10), formations of decalcified pulp stones, oval shape, absence of odontoblasts and dentinal tubules

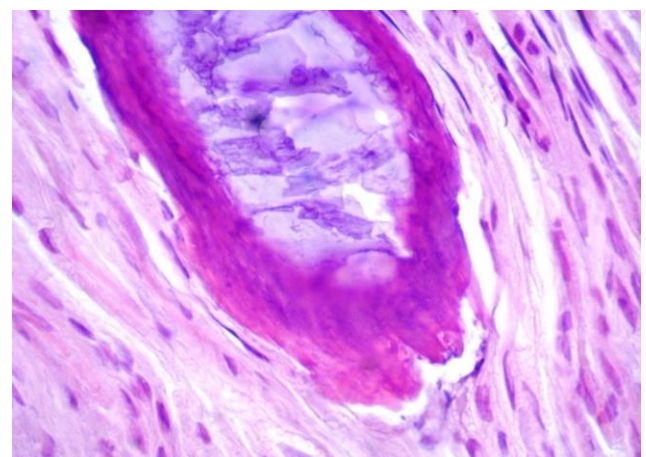


Figure 5: HE staining, (magnify. 10 x 10), the same material of great magnify, details of pulp stone oval shape and around storm of pulp

Irregular shape and the bigger relatively elongated

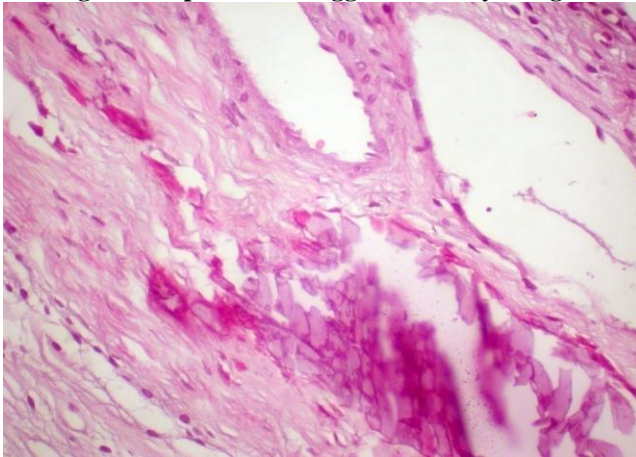


Figure 6. HE staining, (magnify. 10 x 20), irregular of shape, amorphous-crystal calcification with neighboring hyalinized pulp and wide free vascular space

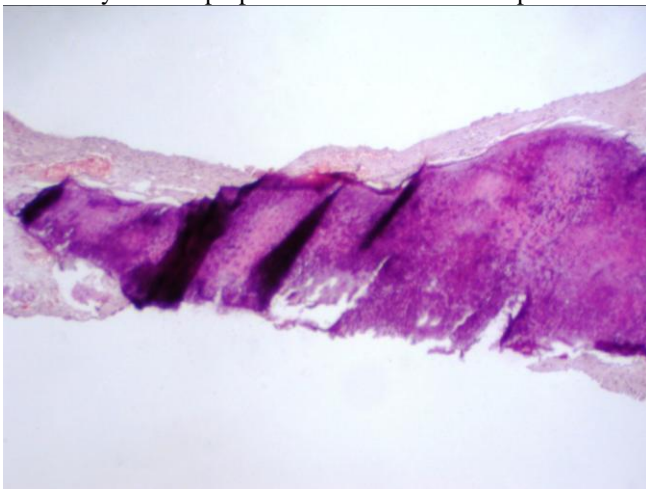


Figure 7: Colouring according to HE, zoom of 10 x 4, formation of radicular the bigger pulp stones, the size of which being such to occupy the pulp almost across all its width and along its length. Visible congested blood vessels

Pulp stones are discrete calcifications and are amongst changes that include more diffuse pulp calcifications such as dystrophic calcification [6].

As a basis for discussion is the finding that the dental calcifications represent a separate model of pathological calcification, fitting into overall pathological calcification, although with different morphological feature. Literature is rich with descriptions of dental calcifications. The studies on the structure, the composition and the size, are not in a large number [7], 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.

Pulp stones vary in size, ranging from microscopic particles to larger masses that almost obliterate the pulp chamber with only the large masses being radiographically apparent [8]. In the present study, regarding the shape, identified 2 groups of radicular dental calcifications: oval shape, which have a degree of bending similar to circle or spherical objects; these calcifications are nodular. A second report from the same

study using the same material histologically demonstrated that the radicular calcification can be irregular shape, corner-like, except the bigger ones, which are relatively elongated, corresponding with Mjor & Pindborg [9,10].

Textbooks discuss the clinical relevance of pulp stones in terms of their effect upon root canal treatment. Their large size in the pulp chamber may block access to canal orifices and alter the internal anatomy. Attached stones may deflect or engage the tip of exploring instruments, preventing their easy passage down the canal (Pashley et al.) [10,11].

4. Conclusions

With this study are confirm that regarding the shape, calcifications show a 2 groups: oval shape, which have a degree of bending similar to circle or spherical objects; these calcifications are nodular and the second group of calcifications consists of calcifications which are of irregular shape, corner-like, except the bigger ones, which are relatively elongated.

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