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Multiple hypercementosis—a case report of an incidental finding on panoramic radiograph

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ABSTRACT

Objectives: This case report is aimed to describe radiographic features of multiple hypercementosis in an incidental case.

Case Report: A 38-year-old man came to the Dental Hospital of Padjadjaran University with a complaint that he had lost some of his teeth and wanted to make dentures because he found it difficult to chew food. Then the patient was referred for a radiographic examination, the results of a panoramic radiograph found abnormalities in the

form of thickening of the cementum at the apex of the remaining teeth. The teeth were in vital condition and there were no clinical signs.

Conclusion: Based on the examination results, it was concluded that the panoramic radiograph showed excessive cementum thickening and root enlargement on the remaining teeth. This case leads to a radiological diagnosis suspect of multiple hypercementosis or cementum hyperplasia.

Keywords: *Hypercementosis, cemental hyperplasia, multiple hypercementosis, panoramic radiograph*

Cite this article: Asykarie INA, Ramadhan FR, Firman RN. *Multiple hypercementosis—a case report of an incidental finding on panoramic radiograph.* Jurnal Radiologi Dentomaksilofasial Indonesia 2022;6(1)17-20. <https://doi.org/10.32793/jrdi.v6i1.735>



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INTRODUCTION

Hypercementosis was first described by Gardner and Goldstein in 1931 as an overgrowth of cementum on the teeth. Radiographically, this condition is seen as radicular cementum deposition which may involve one or several teeth.¹ Hypercementosis is a rare dental disorder that is often found incidentally. It is characterized by excessive deposition of cementum at the tooth apex and is mostly idiopathic.² This disorder does not cause any clinical symptoms or is asymptomatic. Hypercementosis also does not cause any changes in the periodontal ligament and lamina dura. The features of multiple hypercementosis are rarely mentioned in the literature. Usually this is caused by hereditary factors or systemic factors. Radiographically, hypercementosis shows radiopacity in the roots of the teeth which makes the roots appear larger and more rounded.^{1,3}

Cementum is a calcified avascular mesenchymal tissue that forms the outermost part of the tooth root. Abnormalities in cementum thickness are divided into two, namely cemental aplasia or hypoplasia (absence or lack of cellular cementum) and cementum hyperplasia or hypercementosis (excessive deposition of cementum).⁴ In a previous study conducted by Warriar and Vinayachandran, it was found that cases of hypercementosis were detected in 1.7% of cases and were more common in premolars than molars, and the incidence of

mandibular teeth was higher than that of the maxilla.⁵ In another similar case report, it was also mentioned that hypercementosis was more often found in premolars and mostly unilateral or only one or two teeth were affected, although there were some cases where hypercementosis occurred bilaterally or multiple, this is very rare. However, some literature states that this disorder does not require special treatment.^{6,7}

The main etiologic factor in hypercementosis cases is idiopathic, but in most cases this disorder is associated with age, besides other local factors such as trauma, inflammation and changes in masticatory function or excessive occlusal pressure are suspected to be factors that cause hypercementosis. Multiple hypercementosis is not a common disorder, so it is often associated with systemic conditions or hereditary factors. In previous studies it has been mentioned that there is a relationship between hypercementosis and Paget's disease, hyperthyroidism, rheumatoid arthritis, acromegaly, calcinosis and vitamin A deficiency.⁸

The aim of this article is to report a rare case of hypercementosis occurring in number and location in the maxilla and lower. This case report provides an explanation of the radiographic appearance of a case of multiple hypercementosis which was found incidentally on a panoramic radiograph.

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Received on: November 2021
Revised on: December 2021
Accepted on: January 2022

CASE REPORT

A 38-year-old man with complaints of missing several teeth was referred from the prosthodontics department to the dental radiology installation of the Dental and Oral Hospital, Padjadjaran University for a panoramic radiographic examination with the aim of supporting the treatment needs of his dental prosthesis. After obtaining radiographs, it was found incidentally a radiopaque image along the roots of the remaining maxillary and mandibular teeth and made the roots of the teeth appear more enlarged and rounded and blunt. Figure 1 shows the lesion attached to the apical third of the root of the tooth without showing any external resorption pattern in the involved tooth. In addition, the lamina dura and periodontal ligament are still intact and follow the shape of the enlarged tooth root. The patient has confirmed that there are no complaints whatsoever in his teeth, the patient only complains of difficulty in mastication because many of his teeth are missing. Based on the pattern and radiographic characteristics that were seen in the form of enlargement of the roots of the teeth without resorption of the roots and the lamina dura and the intact periodontal ligament, this case was radiodiagnosed as suspected multiple hypercementosis.

DISCUSSION

Cementum is a specialized connective tissue that covers the outermost layer of the calcified matrix on the root surface with the main role of connecting the periodontal ligament tissue to the root surface.¹ The basic function of cementum is to provide tooth support in its socket, cementum consists of 45-50% hydroxyapatite crystals and an organic matrix mainly collagen fibers and mucopolysaccharide ground substance. Cementum settles on the root of the tooth as part of the normal physiological process to maintain the occlusal height, so that the more apically, the thicker the cementum.⁹ In general, there are two types of cementum layer on the root surface, namely primary or acellular cementum and

secondary or cellular cementum. Acellular cementum is a very thin layer that covers the dentin on the root surface, while cellular cementum is a layer that covers acellular cementum. And under normal conditions, cellular cementum is usually present in the bifurcation area and the middle or apical third of the root.¹⁰

Hypercementosis, also known as cementum hyperplasia, is a condition in which there is excessive thickening of the non-neoplastic cementum in the area along the root and can affect one or more teeth and alter the tooth morphology and pattern of normality. This condition is associated with local or systemic factors, but the majority of cases are idiopathic. Hypercementosis occurs in adults and the frequency increases with age and is most likely due to cumulative exposure to predisposing factors. Hypercementosis cases do not require special treatment.¹¹

The mandibular teeth are likely more mentioned in the literature than the maxillary regarding to hypercementosis cases. It was reported that mandibular molars, maxillary and mandibular second premolars and mandibular first premolars are the teeth that most often experience this abnormality, although it may be possible that happen in another teeth. This disproportionate deposition of cementum causes abnormal thickening of the tooth apex which gives the roots a rounded appearance.^{12,13}

This abnormality can occur only at the tip of the tooth root or on the entire root surface. In addition, it can occur in only one tooth or involve many teeth. Localized hypercementosis is usually characterized by enlargement of the apical third of the root in one or two teeth and is more common, whereas multiple hypercementosis is usually found incidentally and is characterized by an increase in cementum thickness involving all teeth and can be a feature or characteristic of patients with systemic disease.¹⁴

The cause of hypercementosis is often associated with local or systemic factors. Local factors include functional stress due to excessive occlusal load due to tooth loss and the presence of periapical pathological conditions. Systemic factors include Paget's disease, atherosclerosis, rheumatism, acromegaly, deforming arthritis, calcinosis, hypertrophic arthritis, thyroid disease



Figure 1. Pre-treatment intra-oral photographs

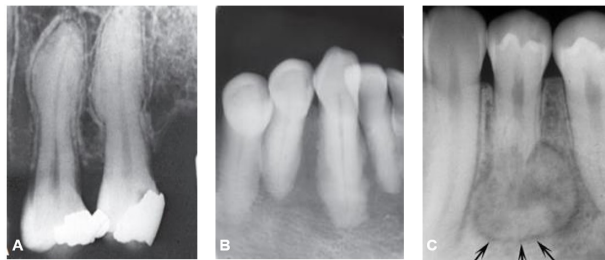


Figure 2. (A) Localized hypercementosis, (B) Hypercementosis in patients with Paget's disease, (C) Cementoblastoma²

and vitamin A deficiency. Most cases of hypercementosis occur in vital teeth.¹⁵

Radiographically, hypercementosis is seen as an enlarged root that is rounded on some or all of the root surface and is surrounded by the periodontal ligament and an intact lamina dura. The periodontal ligament and lamina dura are clearly visible on the outer margin of the hypercementotic tooth root, surrounding the entire root surface as seen in normal tooth roots.^{16,17} Radiographically, hypercementosis did not change the biological width between the root surface, the periodontal ligament and the alveolar bone. Although hypercementosis can be identified radiographically, it is not possible to estimate the amount of excess cementum present in the root because dentin and cementum have similar radiodensities.^{18,19}

Accurate diagnosis and differential diagnosis with other radiopaque lesions are very important because there may be other radiopaque lesions such as cementoblastoma. Radiographically, the appearance of cementoblastoma is similar to that of hypercementosis. Cementoblastoma is a slow-growing and benign odontogenic tumor characterized by the formation of cementum-like tissue attached to the tip of the tooth root. This benign tumor is derived from odontogenic ectomesenchyme. The characteristic feature of this tumor is the development of cementum-like tissue. These lesions are also more common in the mandible and in the premolar and molar regions.²⁰

Cementoblastoma radiographically appears as a round radiopaque lesion at the root tip, well-defined and surrounded by a radiolucent halo. One of the hallmarks of this lesion is the presence of a radial pattern on its internal structure that resembles the image of a wheel.²¹ Radiographically, hypercementosis and cementoblastoma both give a picture of the root of the tooth that looks enlarged and rounded, so that cementoblastoma is a differential diagnosis of hypercementosis. The difference between the two is in hypercementosis, the appearance of a rounded root surrounded by a lamina dura and an intact periodontal ligament without root resorption. In cementoblastoma, the radiopaque appearance of the root is surrounded by a radiolucent image (radiolucent halo), there is root resorption, the ligament and lamina dura

disappear, and there is expansion of the cortical bone (Figure 2).^{22,23}

Based on the morphology, the appearance of hypercementosis can be classified into four, namely normal root appearance, diffuse, focal or localized and "shirt sleeve cuff" appearance. Based on this classification, the case that we report belongs to the diffuse type (Figure 3). In healthy teeth, patients with hypercementosis do not require any treatment. However, in the case of treatments such as endodontics and extractions it will be more difficult to process, thus dentists who find these abnormalities incidentally on radiographic examination should be more alert before performing these treatments.²⁴

In another case report that reported a case of hypercementosis that occurred in molar without antagonistic teeth, it was stated that almost all teeth with hypercementosis did not have antagonist teeth, usually hypercementosis was seen in one third of the root with nodular thickening and occurred in an effort to maintain the width of the periodontal ligament due to excessive occlusal pressure.¹⁰

Hypercementosis can be said to be an adaptive response to the increase in periodontal tissue due to functional stress, this occurs due to an increase in the amount of cementum matrix attached to the surface of the periodontal fibers. Cementoblasts on the surface result in the deposition of cementum organic matrix. These cells line the root surface between the periodontal fibers, which are also known as "sharpey fibers" which fuse or adhere to the collagen cementum. Collagen in cementum forms a fibrillar network that is sometimes parallel to the tooth root surface or is irregularly distributed. Excessive pressure on the tooth surface will form a thickening of cementum.²⁵

Multiple hypercementosis is a rare disorder. In addition to panoramic radiographs, patients are also advised to do blood tests to help diagnose whether the etiology of this disorder is caused by local factors or systemic factors. Serum calcium, phosphorus, alkaline phosphatase levels and thyroid function are among criteria that should be tested. In addition, if teeth with hypercementosis require extraction or endodontic treatment, modifications in the treatment process are

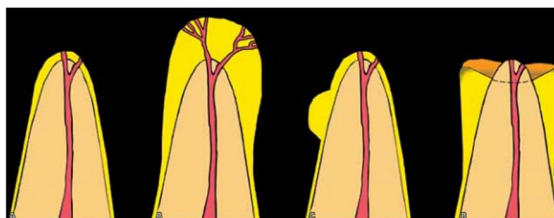


Figure 3. Morphological type hypercementosis, (a) Normal root, (b) diffuse type, (c) focal or local type, which is limited to isolated root surfaces and (d) shirt sleeve cuff type, which does not involve the most apical part and only occurs in the periphery as a result of chronic periapical lesion²⁵

required.¹⁸

Based on all these characteristics, the findings observed in the present clinical case since radiographs show intact lamina dura and no root resorption. Therefore, all these data support a diagnosis of multiple hypercementosis. In this case report, our patient has no specific systemic etiology and refuse to do the blood test, so the mechanism of cementum thickening in the remaining maxillary and mandibular teeth cannot be explained with certainty. We assumed that the etiology of this case leads to excessive occlusal pressure.

During the panoramic radiography imaging interpretation, there is the possibility for the dentist to identify radiographic findings unrelated to the main reason of the imaging examination or to the patient's complaint. In this case, the radiographic modality used is a panoramic radiograph, where this modality is the most requested imaging exams in dentistry because panoramic proper information for most oral planning. Furthermore, the panoramic imaging allows the complete visualization of dental and bone anatomic landmarks and structure in the maxilla and mandible.²⁶

Other than panoramic, CBCT has a better evaluation ability of hypercementosis cases as it is enabled us to observe hyperdensity within the buccal and lingual cortical bones limits, including the presence of intact lamina dura and absence of root resorption. Thus, suggesting a diagnosis of hypercementosis. Due to these lesions shapes, CBCT can become very important for the evaluation of their specific conditions and observation of their anatomical structures, thus allowing a better analysis for diagnosis to avoid incorrect diagnosis.²⁷

CONCLUSION

The dental abnormalities found incidentally on panoramic radiographs in which excessive cementum thickening and root enlargement appeared rounded and the lamina dura and periodontal ligament intact in most of the remaining maxillary and mandibular teeth in this case report led to the diagnosis of multiple hypercementosis or cementum hyperplasia.

FOOTNOTES

All authors have no potential conflict of interest to declare for this article. Informed consent was obtained from the patient for being included in this case report.

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