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Frequency of Hypercementosis in 1254 Extracted Permanent Human Teeth: Biological Explanation and Clinical Implication

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Research Article

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ABSTRACT

Background: Hypercementosis is an excessive formation of cementum above and beyond the extent necessary to fulfill its normal functions, resulting in abnormal thickening and changes in the macroscopic shape of the root.

Methodology: 1,254 human teeth collected from Department of Oral Surgery and Pathology, University of Benin Teaching Hospital over 10-year period were analyzed for hypercementosis. Deciduous and fractured teeth were excluded from the total number of teeth examined.

Result: Result revealed that the frequency of hyercementosis was more in the molars (18.26%) followed by the premolars (7.34%) and least was the caries (2.23%).

Conclusion: Further detailed studies on the impact of age-related increase in cementum thickness on the biology of induced tooth movement is required.

INTRODUCTION

Cementogenesis begins with fragmentation of Hertwig epithelial root sheath, which is derived from apical prolongation of the combined outer and inner enamel epithelium of the enamel organ. The newly formed surface of root dentin comes into contact with the undifferentiated cells of the dental sac. This stimulates the activation of cementoblasts to begin cementogenesis. This is through reciprocal inductive signal from the newly formed dentin [1-3]. This specialized calcified substance covers the root of a tooth and forms part of the periodontium that attaches the teeth to the alveolar bone through the periodontal ligaments [4]. Hypercementosis is an idiopathic, non-neoplastic condition characterized by the excessive build-up of normal cementum on the roots of one or more teeth [5]. Local factors such as trauma, non-functional tooth and unopposed tooth has been associated with this. The origin of hypercementosis is attributed to conditions such as functional stress due to occlusal forces [6] continuous dental eruption [7] incorporation of periodontal cementicles during physiologic cementum deposition, reactionary deposition in response to inflammatory process [8] systemic factors such as atherosclerosis, acromegaly deforming arthritis, hypertrophic arthritis, thyroid diseases and Paget's disease [9] shows the alterations in dental root morphology due to hypercementosis with extensive endodontic [10] orthodontic [11] and surgical [12] challenges.

MATERIALS AND METHODS

A total of 1,254 teeth were collected from Department of Oral Surgery and Pathology, University of Benin Teaching Hospital over 10 year period used for teaching of Oral Biology to Dental students in both University of Benin and University of Port-Harcourt stored in 10% formalin bottle (in line with Centre for Disease Control, and Prevention guideline for infection control) for teeth used for research and teaching [13,14]. The teeth were sorted into anterior permanent teeth, premolars and permanent molars with identifying tooth indices by tooth-type. Each tooth-type was examined for hypercementosis. Deciduous and fractured teeth were excluded from the total number of teeth examined to avoid spuriousness **(Figure 1 and Table 1).**

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Figure 1: 1254 Extracted human teeth.

S/N	Tooth-Type	Number	%
1.	Incisors	81	6.46
2.	Canine	28	2.23
3.	Premolar	92	7.34
4.	Molars	229	18.26
Total		430	34.29

Table 1. Percentage hypercementosis of extracted 1,254 human permanent teeth.

RESULTS

The tooth was sorted as three types such as anterior, premolars and molars. Results revealed that Hypercementosis was more in the molars (18.26%) followed by the premolars (7.34%) and least was the caries (2.23%). Total percentage hypercementosis was (34.29%).

DISCUSSION

Hypercementosis is an abnormal thickening of cementum which may be generalized or localized. Localized hypercementosis is usually characterized by modular enlargement of apical third of root **(Figure 1)** [15]. Generalized hypercementosis is characterized by increased thickness of cementum involving all teeth and is a classical feature of Paget's disease. Other systemic disturbances associated with hypercementosis include acromegaly, arthritis, calcinosis, rheumatic fever and thyroid goiter [16]. Root cementum is a dynamic tissue and exhibits compensatory thickening during the human life to counteract tooth weak. This has been seen to differ between tooth groups and tooth surfaces, our study revealed molars as the most affected (18.26%), this is in tandem with Mohan [17] and in contrast with Consolaro et al. [11] (8.16%). However, there is consensus in the sequence of tooth-type affected (molar, premolar and incisors). Hypercementosis poses serious challenge for endodontic therapy in restorative dentistry and in contemporary orthodontics **(Figure 2).**

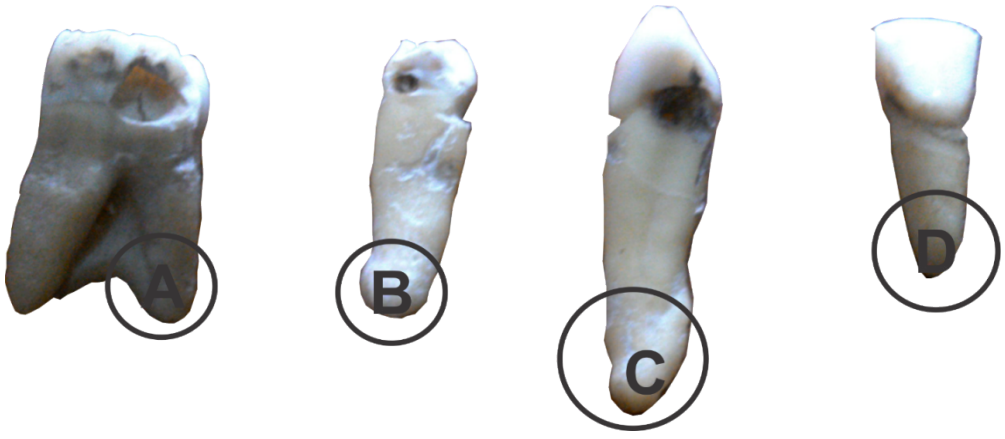

Figure 2. Hypercementosis by tooth-type, A: Molar, B: Premolar, C: Canine, D: Incisors.

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CONCLUSION

Further detailed studies on the impact of age-related increase in cementum thickness on the biology of induced tooth movement will throw more light on the physical and biological characteristics of hypercementosis in the context of orthopedic and orthodontic treatment. Future further studies are therefore recommended.

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