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Communication

Prevalence of hypercementosis in a Saudi Arabian population: A cone beam computed tomography study.

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Abstract: Objective: To determine the prevalence of hypercementosis in a Saudi Arabian population. Material and methods: A total of 642 CBCT scans from patients comprising 4471 teeth were incorporated in the study sample. All teeth were analyzed for the presence of hypercementosis in sagittal, axial and coronal plains by two qualified and experienced observers. The characteristics of the involved tooth in terms of gender, jaw and location were recorded from the CBCT scans. The obtained data were statistically analyzed using SPSS 21.0. The reliability of measurements was evaluated by kappa statistics. Results: Out of total 642 subjects hypercementosis was observed in 31 patients (4.82%) and 43 teeth (0.96%). Eight (2.68%) maxillary 1st molars, 6 (1.88%) mandibular 1st molars, 5 (1.46%) maxillary second molars, 7 (1.95%) mandibular 2nd molars, 9 (4.76%) maxillary 3rd molars and 8 (3.58%) mandibular 3rd molars were observed to have hypercementosis. Among males, 4.76% were affected with hypercementosis as compared to 4.86% of females (p=0.97). Likewise, no significant difference in the occurrence of hypercementosis was observed between maxillary and mandibular arches or between sides (p>0.05). Conclusion: The prevalence of hypercementosis in a Saudi population was found to be 4.82% with respect to patients and 0.96% with respect to teeth. No significant propensity for gender, jaw and arch side was noted.

Keywords: Root; cone-beam computed tomography; hypercementosis.

INTRODUCTION.

Hypercementosis, otherwise called cementum hyperplasia, is characterized by thickening of the cementum.[1] It might be confined to the root apex, on any root surface or within the entire root. This condition might be segregated to a single tooth, may include numerous teeth, or may show up as a cumulative process. Premolars are the most frequently affected teeth.[2]

The etiology of hypercementosis is related to both local and systemic factors.[3] Local factors include occlusion forces, periapical pathologies, and trauma.[4] Systemic factors include Paget's disease of bone, rheumatic fever, hyperthyroidism, atherosclerosis, acromegaly, deforming arthritis, hypertrophic arthritis, calcinosis and vitamin A deficiency.[5,6] Hypercementosis is observed mainly in older individuals, and the frequency increases with age. Its occurrence has also been reported in younger patients, and many of these cases illustrate the influence of genetic factors.[7]

Radiographically, hypercementosis can be seen as an increased deposition of cementum localized to a part of or to the whole tooth, and the affected tooth may display an altered, abnormal, round-shaped thickness at the

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apical portion of the root. Normal radiolucent periodontal membrane space and an intact lamina dura are contained within the boundaries of the root.

Hypercementosis can be detected on conventional dental radiographs such as panoramic radiographs and periapical radiographs, but hypercementosis in the maxillary arch cannot be visualized well due to superposition. Teeth with hypercementosis can be easily appreciated using cone beam computed tomography (CBCT).[8]

Limited studies are present in the literature so that the prevalence of hypercementosis in general as well as the prevalence of hypercementosis by race or population is not well established to date. To the best of our knowledge only one study has evaluated the prevalence of hypercementosis using CBCT.[8] In this study, we used CBCT to determine the prevalence of hypercementosis in a Saudi Arabian population.

MATERIALS AND METHODS.

Design

This cross-sectional study was carried out in the College of Dentistry, at Aljouf University, Kingdom of Saudi Arabia. Clearance was obtained from the Ethical Committee (JU/COD/15-04), and consent was obtained from all the participants.

Setting and participants

Medically fit patients 18 years of age or older agreed to undergo CBCT scan using a Scanora 3D (Soredex, Tuusula, Finland; 6 mA and 89 kVp).

Those teeth with missing antagonist, patients with any disease or syndrome affecting the cementum formation, patients with occlusal trauma or orthodontic therapy, and scans with periapical granuloma were excluded from the study.

Data collection

All teeth were analyzed in sagittal, axial and coronal plains by two qualified and experienced observers. Hypercementosis was diagnosed by the radiographic appearance of a thickened cementum layer as well as a bulbous or drumstick shape around the root apex that could be in the vestibulo-lingual/palatinal, mesiodistal or apical direction in the CBCT sections.[8]

To minimize intra-observer variations, the same examiners repeated measurements 14 days later. The characteristics of the involved tooth in terms of gender, jaw and side, were recorded from the CBCT scans.

Statistical methods

Data were analyzed using SPSS 21.0 (Chicago, USA) by a applying chi-square test. The reliability of measurements was evaluated by kappa statistics. The statistical significance was set at $p<0.05$.

RESULTS.

A total of 642 CBCT scans (354 males and 288 females) with a mean age 41.2±12.5 years comprising 4471 teeth were incorporated in the study sample.

The reliability was very good, with Kappa values of 0.91 for intra-operator agreement and of 0.84 for inter-operator agreement.

Out of the 642 CBCT scans, hypercementosis was observed in 31 patients (4.82%) and 43 teeth (0.96%). Statistics by tooth and arch are shown in Table 1.

Table 1. Distribution of teeth with hypercementosis.

Tooth type	Maxillary arch		Mandibular arch	
	No. of teeth examined	Teeth with hypercementosis n (%)	No. of teeth examined	Teeth with hypercementosis n (%)
Central incisor	198	0 (0)219	0 (0)	
Lateral incisor	162	0 (0)186	0 (0)	
Canine	217	0 (0)227	0 (0)	
First premolar	384	0 (0)409	0 (0)	
Second premolar	359	0 (0)381	0 (0)	
First molar	298	8 (2.68)	319	6 (1.88)
Second molar	342	5 (1.46)	358	7 (1.95)
Third molar	189	9 (4.76)	223	8 (3.58)
Total	2149	22 (1.02)	2322	21 (0.90)

Table 2. Comparison of distribution of hypercementosis according to gender, arch and side.

Teeth location (Jaw and side)		No. of teeth examined	Teeth with hypercementosis n (%)
Maxillary arch	Left side	970	12 (1.23)
	Right side	1179	10 (0.84)
Mandibular arch	Left side	1101	11 (0.99)
	Right side	1221	10 (0.81)
Total		4471	43 (0.96)

Hypercementosis was observed in 4.76% of males and in 4.86% of females, a difference not statistically significant (p=0.9721).

No significant differences were observed between maxilla and mandible location on the left side (p=0.6064), the right side (p=0.9372), or on both sides (p=0.3440), nor between sides in maxilla (p=0.3731) or mandible (p=0.6470). Statistics by arch and sides are shown in Table 2.

DISCUSSION.

The prevalence of hypercementosis ranges from 1.3% to 84% as reported in the literature.[9,10] In a study among a Turkish population, the prevalence of hypercementosis was reported to be 2.4%. The authors noted that the prevalence of hypercementosis was double in molars compared to premolars, and more often present in the lower jaw compared to the upper jaw.[9]

Burklein *et al.,*[10] found the prevalence of hypercementosis to be 1.3% in a study carried out on a German population using intraoral periapical radiographs. They also reported that the lesion was most commonly observed on premolar teeth and its prevalence was double in the mandible compared to the maxilla.

In our study none of the premolars were observed to be affected by hypercementosis and we did not observe notable differences between the two arches. Regarding gender differences, Burklein *et al.,*[10] found that the prevalence of hypercementosis was nearly 10 times higher in females compared to males.

Eren *et al.,*[8] noted a slightly increased prevalence of hypercementosis in females compared to males. This observation is in accordance to our study, as we noticed a non-significant increased prevalence of hypercementosis among females.[9]

The effects of hypercementosis on the mesiodistal direction at the root apex can be evaluated using conventional techniques such as panoramic and intra oral periapical radiographs in two dimensions. However, chances of superimposition exist in the two-dimensional imaging techniques and vestibule-lingual/palatal evaluation is not possible. Consequently, lesions may be missed, especially those in the direction of the vestibule-lingual/palatal plane.

Moreover, it is difficult to distinguish hypercementosis from other lesions that produce similar images like benign cementoblastoma, rarefying osteitis, odontoma, cementifying fibroma, periapical cemental dysplasia, and florid cement-osseous dysplasia. Hypercementosis in association with a primary cause requires treatment and if missed due to superimposition or confused with other similar lesions, may result in delayed treatment.

The major clinical significance is relevant to the exodontist, who finds extracting the teeth with hypercementosis problematic. Cementum deposition may lead to an increase in the cementum canal and consequently the distance from cementum-dentin junction to apical root end may also be increased, which may be a problem for endodontic therapy. The results of this study provide oral surgeons and endodontists data regarding the prevalence of hypercementosis.

This study has the limitation of a small sample size collected from a single centre, so the results may not apply to the population of an entire nation.

CONCLUSION.

The prevalence of hypercementosis in a Saudi population is found to be 4.82% with respect to patients and 0.96% with respect to teeth. No significant differences between gender, jaw and side involved was noted.

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