The incidence of Oro-Maxillofacial lesions (10 years) in Department of Oral and Maxillofacial Surgery, Mahidol University: Fibro-osseous lesions

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Abstract

Objective: To study of the incidence of fibro-osseous lesions (FOL) from the clinicopathological feature by retrospective study in Department of Oral & Maxillofacial Surgery, Mahidol University.

Materials and methods: 45 cases of FOL from a total of 1,962 cases of Thai patients were diagnosed from Department of oral and maxillofacial surgery, Mahidol university, in 10 years during 2003 and 2012. The demographic data, clinical, radiographic and histopathologic features from each individual patient's histopathologic records were reviewed and analyzed.

Result: The most common was 46.67% ossifying fibroma (OF), 28.89%fibrous dysplasia (FD), 24.44% osseous dysplasia (OD). The gender incidence of FOL were 88.89% of cases occurred in female. The mean age of OF, FD and OD was 36, 38 and 47 years respectively. The incidence of location of FOL were 61.90 %, 90.91% OD mostly affected in posterior mandible but 76.92% FD affected in maxilla. The clinical feature of painless swelling is most common in 57.14% OF and 69.23% FD respectively, but 53.64% OD asymptomatic. The incidence of radiological feature, 42.86% showed mixed to radiopacity with well-defined margin was predominent in OF, and 38.46% showed ground-glass and radiopacity with ill-defined margin was predominant in FD. The incidence of histopathologic feature 84.62% FD showed woven and/or lamella bone trabeculae in specimens, but 80.95% OF were found cementum-like material. The incidence showed osteoblastic rimming 14.29% OF and 15.38% FD respectively.

Conclusion: The clinical and radiological features of FOL in this study were similar to the most previous study, but the histopathological feature was varied in each subtype of FOL.

Keywords: Fibro-osseous lesion, Fibrous dysplasia, Ossifying fibroma, Osseous dysplasia, Clinicopathological feature, histopathologic feature, radiographic feature

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Introduction

Fibro-osseous lesions (FOL) are a varient group of intraosseous disease with variable aetiologies and pathogenesis but which share similar and overlapping histological feature that make precise categorization difficultly. All are characterized by the replacement of normal mature bone firstly by a variably cellular fibroblastic stroma within which pathological ossification and/or calcification then occurs. The definitive diagnosis is not only really possible by histopathological feature but always need both clinical and radiological correlation. Most require a combined assessment of clinical, radiological and histopathological features.[1-5]

The classification of FOL has been proposed by several previous articles. The recent classification proposed by Eversole et al. (2008) categorized intensively benign FOL of the craniofacial complex into 5 groups as bone dysplasia, cement-osseous dysplasia, inflammatory/reactive process, metabolic disease and neoplastic lesion.[4] However, the universally accepted classification suggested by WHO classification of head and neck tumors in 2005 in bone related lesions and Speight et al. in 2006 were classified according to developmental, reactive, and neoplastic process include fibrous dysplasia (FD), ossifying fibroma (OF) and osseous dysplasia (OD),[3,6] that osseous dysplasia was categorized into 3 subtypes of focal osseous dysplasia (FOD), florid osseous dysplasia (FIOD) and periapical osseous dysplasia (POD).

The FOL has wide range of biological behaviors and recurrence rate so the treatment varies depending on the nature of the lesion. It may have no treatment or curettage or surgical resection.[7,8]

The aim of this study was to study the incidence, clinical, radiological, and histopathological features of FOL in 45 Thai patients diagnosed in the Department of Oral and Maxillofacial Surgery, Mahidol University.

Materials and methods

There were 45 cases of FOL from 1962 diagnosed biopsy records, were diagnosed in the Department of Oral and Maxillofacial Surgery, Mahidol University during 2003 to 2012 (10 years), according to the criteria of Barnes et al.,[6] and Speight et al.[3]

The demographic data, clinical feature, radiological, and histopathological feature were reviewed and analyzed from each individual patient's pathologic records

We divided the maxilla into 3 regions: anterior region from the right canine to the left canine area, posterior from the first premolar to tuberosity area, and the combination of anterior and posterior region. The mandible was divided into 5 regions: anterior region from the right canine to the left canine area, posterior region from the first premolar to the retromolar area, the combination of anterior and posterior region, the combination from the posterior and ramus region, and the combination of these sites.

The radiographic feature was recorded into radiolucency, mixed radiolucent-radiopacity, ground-glass appearance, and radiopacity from the radiological records. The margin of the lesion was devided as well-defined and ill-defined margin. The histopathological feature was studied according to the predominent characteristic of mineralized material and fibrous stroma.

Four cases that provide incompleted clinical records and insufficient data for a definitive diagnosis were excluded from this study.

This study was a retrospective study that evaluated data from histophathological records. Our study was also performed under the permission of Chairman of Oral and Maxillofacial Department, Mahidol University.

Results

From total 1,962 reviewed histophathological record found 45 cases of fibro-osseous lesions (FOL) with the incidence of 2.29%. We found ossifying fibroma (OF) 21 cases that is 46.67%, 28.89% of fibrous dysplasia (FD) from 13 cases and 24.44% of osseous dysplasia (OD) from 11 cases respectively.

Osseous dysplasia was categorized into focal osseous dysplasia (FOD) 7 cases and florid osseous dysplasia (FIOD) 4 cases. We did not find periapical osseous dysplasia (POD).

The FOL found in male 5 cases and female 40 cases. The ratio of female and male in OF was 9.5:1 and FD 3.3:1 respectively, and found all OD cases only in female.

FOL patients had range of age from 15 to 77 years, the most prevalence age of OF was 20 to 49 years with the mean of 36 years. We found the most prevalence age of FD were 10 to 29 years with the mean of 38 years. Whilst mean age of FOD and FIOD was 48 and 46 years, respectively as showed in Table 1.

Table 2 the incidence of FOL was commonly affected in mandible than maxilla. Moreover we found at posterior mandible of 61.90% OF, 100% FOD and 75% FIOD respectively, while found 53.85% FD at posterior maxilla.

The symptoms in FOL patients were painless swelling in 57.14% OF and 69.23% FD respectively. In OD we found accidentally 41.42% FOD and 50.0% FIOD with no any symptom respectively.

Table 3 showed the radiographic features of OF, were 42.86% mixed radiograghic feature of radiolucent and raiopacity and 42.86% only radiopacity as well as 66.67% showed of well-defined margin (**Figure 1**).

In FD showed 38.46% of ground-glass appearance and 38.46% radiopacity with 38.46% of ill-defined margin (**Figure 2**).

Figure 4 showed radiograghic feature of FOD 41.42% of radiopacity with 57.14% well-defined margin (**Figure 3**) but in FIOD would showed in several patterns.

Table 1 The distribution of demographic data in 45 fibro-osseous lesions of the jaws

Parameter	Ossifying Fibroma (n)	Fibrous dysplasia (n)	Osseous Dysplasia		Total (n)
			Focal (n)	Florid (n)	
Total cases n (%)	21 (46.67)	13 (28.89)	7 (15.56)	4 (8.89)	45 (100)
Gender					
Male	2	3	0	0	5
Female	19	10	7	4	40
Male:Female ratio	1:9.5	1:3.3			1:8
Age					
10-19	1	3	0	0	4
20-29	6	3	1	0	10
30-39	7	1	1	2	11
40-49	5	2	2	1	10
50-59	1	2	2	0	5
60-69	1	2	1	0	4
70-79	0	0	0	1	1
Range (years)	15-63	17-69	30-68	32-77	15-77
Mean age (years)	36	38	48	46	39

Table 2 The percentage of distribution site of the jaws in 45 fibro-osseous lesions

Location	Ossifying Fibroma n (%)	Fibrous dysplasia n (%)	Osseous Dysplasia		Total n (%)
			Focal n (%)	Florid n (%)	
Maxilla	5 (23.81)	10 (76.92)	-	-	15 (33.33)
Anterior	1 (4.76)	1 (7.69)	-	-	2 (4.44)
Posterior	2 (9.52)	7 (53.85)	-	-	9 (20.0)
Anterior/Posterior	2 (9.52)	2 (15.38)	-	-	4 (8.89)
Mandible	16 (76.19)	3 (23.08)	7 (100)	4 (100)	30 (66.67)
Anterior	1 (4.76)	-	-	-	1 (2.22)
Posterior	13 (61.90)	2 (15.38)	7 (100)	3 (75)	25 (55.56)
Anterior/Posterior	1 (4.76)	-	-	1 (25)	2 (4.44)
Posterior/Ramus	1 (4.76)	-	-	-	1 (2.22)
Anterior/Posterior/Ramus	-	1 (7.69)	-	-	1 (2.22)

Table 3 The percentage of clinical and radiographic features in 45 fibro-osseous lesions of the jaws

Parameter	Ossifying Fibroma n (%)	Fibrous dysplasia n (%)	Osseous Dysplasia		Total n (%)
			Focal n (%)	Florid n (%)	
Symptoms					
Painless swelling	12 (57.14)	9 (69.23)	1 (14.29)	1 (25.0))	23 (51.11)
Painful swelling	4 (19.05)	1 (7.69)	1 (14.29)	1 (25.0)	7 (15.56)
Asymptomatic	5 (23.81)	3 (23.08)	5 (41.42)	2 (50.0)	15 (33.33)
Radiographic features					
Radiolucency	3 (14.29)	-	1 (14.29)	2 (50.0)	6 (13.33)
Mixed	9 (42.86)	3 (23.08)	1 (14.29)	1 (25.0)	14 (31.11)
Ground-glass	-	5 (38.46)	-	-	5 (11.11)
Radiopacity	9 (42.86)	5 (38.46)	5 (41.42)	1 (25.0)	20 (44.44)
Well-defined	14 (66.67)	2 (15.39)	4 (57.14)	1 (25.0)	21 (46.67)
Ill-defined	4 (19.05)	5 (38.46)	1 (7.69)	-	10 (22.22)
Not specified	3 (14.28)	6 (46.15)	2 (28.57)	3 (75.0)	14 (31.11)

The histopathological features of FOL featured in various characteristics. However, there were some common characteristics which mineralized materials were woven bone trabeculae, lamellar bone trabeculae and cementum-like material.

In OF found cementum-like material 80.9% lesions of 17/21 but there was no lesion found mixed woven and lamellar bone trabeculae.

In FD found woven bone trabeculae and/or lamellar bone trabeculae 84.6% lesions of 11/13, however there was cementum-like material only 15.4% lesion of 2/13.Moreover, there were 53.8% lesion of 7/13 showed Chinese pattern, Staghorn-shaped, irregular-shaped pattern and C-shaped trabeulae.

In OD group showed all 3 mixed mineralized material characteristics which was

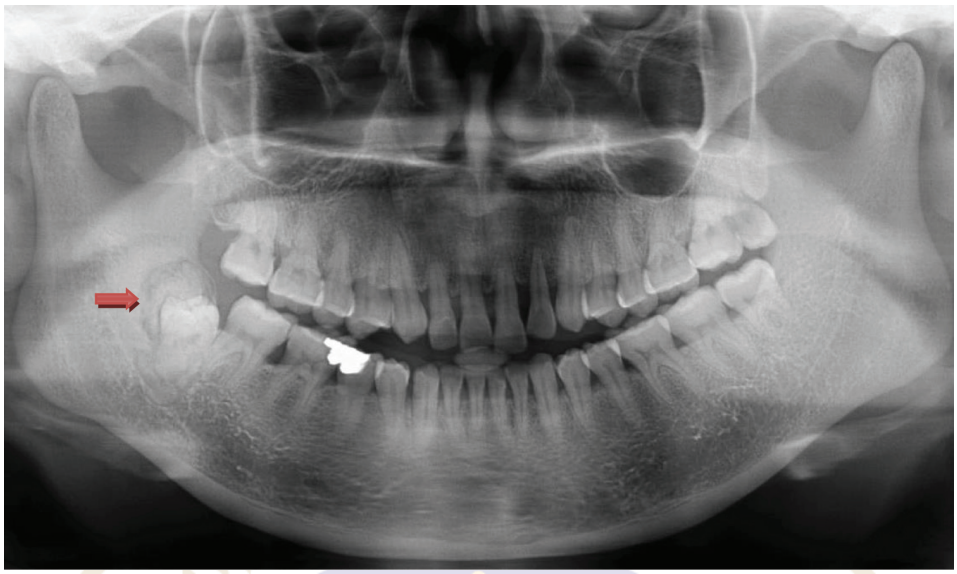

Figure 1 Area 48 showed mixed radiolucent and radiopacity of ossifying fibroma.

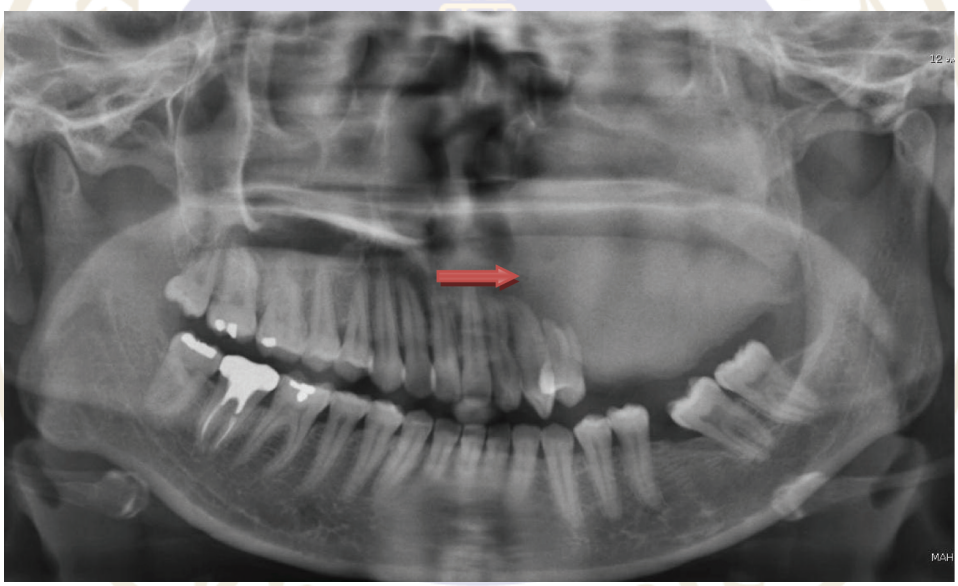

Figure 2 At left maxilla showed ground-glass appearance of fibrous dysplasia.

not remarkable. Besides, there were osteoblastic rimming characteristic 14.3% lesion of 3/21 OF and 15.4% lesion of 2/13 FD respectively,

We also found multinucleated giant cell in 9.5% OF in 2/21 cases, 15.4% FD in 2/13 cases and 25% FIOD in 1/4 cases respectively.

Furthermore, OF could be defined from adjacent tissue only 9.5% in 2/21cases on the other hand FD found to be similarly merge to adjacent bone only 15.4% in 3/13 cases.

Discussion

In this retrospective study of 45 cases of FOL patients showed the least prevalence in OD, which is different from the previous study of Waldron[2] and Santos Netto et al.[9], found that OD was the most common lesion in FOL because this lesion is usually asymptomatic and accidentally find in radiographic image therefore it is often unrecognized.

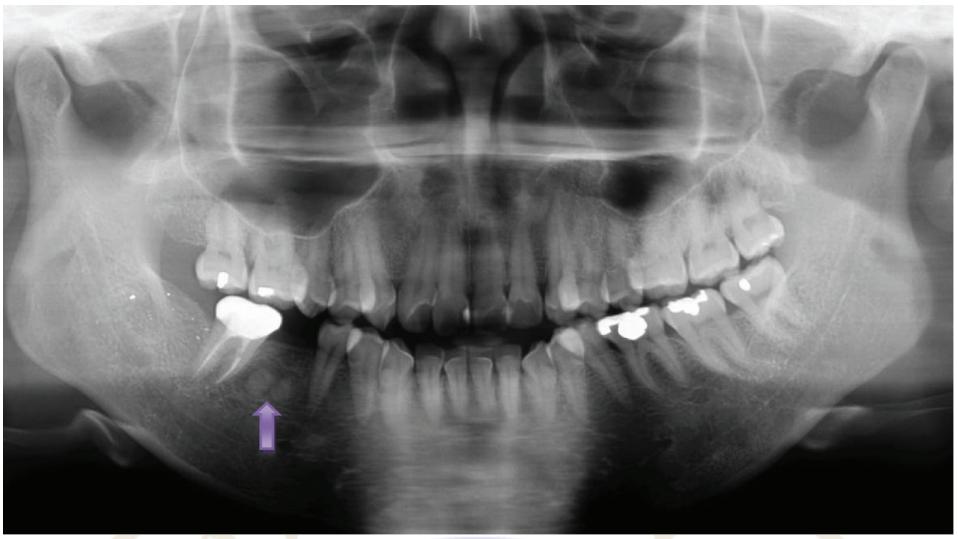

Figure 3 Edentulous area of 46 showed radiopaque lesions of focal osseous dysplasia.

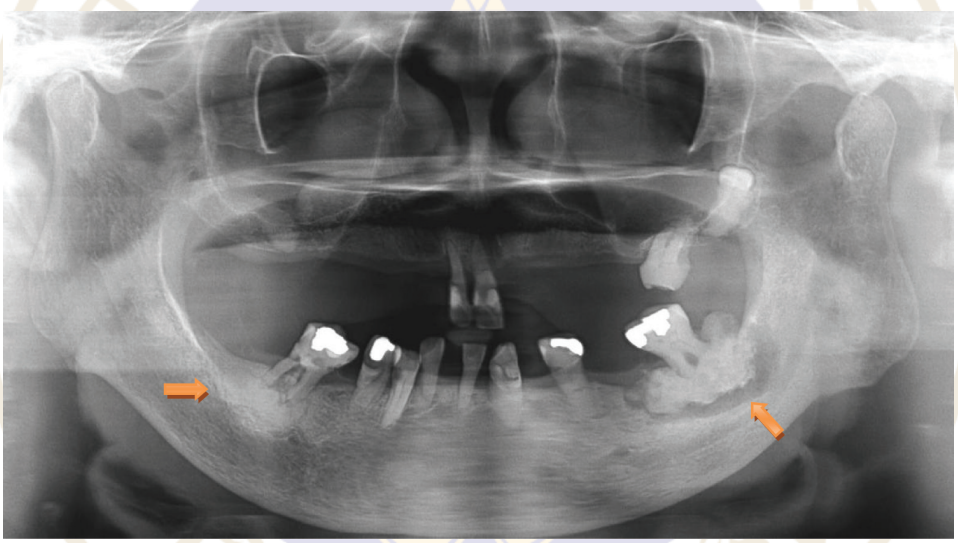

Figure 4 Florid osseous dysplasia affecting bilateral mandible by mixed radiolucent and radiopacity.

Santos Netto et al.[9] reported a study of 143 FOL patients in Brazil, found mostly were OD (67.9%). They studied from clinical oral diagnosis, which a lesion could be found in radiographs, different from this study we studied from the histopathologic records in Oral and Maxillofacial surgery clinic. However, our study is similar to the previous studies of Alsharif MJ et al.[10], Worawongvasu R et al.[11] and Lasisi et al.[12]

We found OF is the most incidence at 46.7%. On the contrary of the study of Ogunsalu CO et al.[13], Phattarataratip et al.[14], and Muwazi et al.[15] found that FD is more incidence than OF.

Furthermore, FOL is more common in females,[9,11-15] different from the study of Alsharif MJ et al.[10] found in males more as shown in Table 4.

FD is a developmental dysplastic disorder caused by activating postzygotic mutation of the GNAS-1 gene encoding on chromosome 20. The disease can occur in one bone called monostotic FD or several contigeous bones within the head and neck called craniofacial FD or several

bones thoughout the skeleton called poliostotic FD which can be associated with additional non-bony abnormalities, such as Café au lait skin pigmentation, endrocrinopathy. The severity of FD depends on the stage of mutation.[16-18] FD is usually found in the second and third decades of life[4,8] as well as this study. However, it could be found in the sixth and seventh decades of life and the mean age was higher in this study probably due to delay diagnosis caused by the nature of the disease, are slow growing and painless swelling. The radiographic appearance of FD may vary depending on the degree of mineralization. Most cases show ground-glass appearance with ill-defined margin[16-19] as well as the present study found 38.46% of cases.

OF is a true benign neoplasm that can occur in a wide range of age groups, especially in middle-aged adults. The disease usually affects at the tooth bearing area of posterior mandible and most have painless swelling. The radiologic appearance often present as a well-circumscribed with radiolucency with varying degrees of calcification, mostly is mixed radiolucent-radiopacity.[4,6,20-21] In this study we found mixed radiolucent-radiopaque and pure radiopacity appearance equally probably owing to the higher average age than other studies.[9,12,13]

OD is a reactive lesion which is considered originating from the periodontal ligament. We also found a prominent predilection of OD in black females of third to fifth decades. Most cases usually present asymptomatic and found incidentally on radiographs,[4-6, 22-24] similar to our study. Notably, the number OD patients were so a little bit not adequate. In addition, OD can be associated with pain, swelling, tenderness, purulent discharge, delayed wound healing after tooth extraction.[25,26]

Although the histopathological features of FOL are similar, their typical characteristics in each subtype can assist in the differential diagnosis. The histophathological feature of FD showed Chinese pattern of bone trabeculae and extent of lesion blended to the adjacent tissue, whereas The histophathological feature of OF present storiform pattern of stroma, extent of lesion separated from surrounding tissue or fibrous capsule presentation, and irregular trabeculae with predominant osteoblastic rimming.[2-6] Differently, this study found that osteoblastic rimming could seen in both FD and OF, therefore this characteristic cannot distinguish between them. However, 23% FD of 3/13 cases and 9.5% OF of 2/21 in this study could identify histopathologically the margin of lesions, it underrepresented important features to differentiate the diagnosis. The specimens include the margin of the lesion are thereby worthy.

OD has the most common site and radiological appearance similar to OF and variable content of mineral substances in specimen but OD usually presents more vascular close to the bone trabeculae and free hemorrhage than OF. Besides that, the specimens of OD usually cannot shell out like OF.[3-6,22,23]

However, some FOL cases show extremely overlapping characteristics, the immunochemical detection with molecular analysis help to make the definitive diagnosis. Toyosawa et al.[27] reported that immunoreactivity for osteocalcin has been shown to be strong in the FD calcified materials, but weak in OF lesions. Furthermore, Patel et al.[28] reported that Arg-201 codon mutation of GNAS as a molecular marker for FD could not show in OF and OD cases.

In conclusion, the most prevalence of 45 cases of FOL in the Department of Oral and Maxillofacial Surgery, Mahidol University was OF, followed by FD and OD, respectively. Female is mainly sex predilection. The age range of the patient found widely which the mean age of OD was older than OF and FD. The radiographic feature can present variable from radiolucency to radiopacity and the histopathological feature is

overlapping. Therefore, the combination of clinical, radiological and histopathological features must be evaluated to make a definitive diagnosis and appropriate treatment plan. The recurrence and malignant malformation that must be concerned are considered carefully about long term follow up depending on behavior of lesion.

Acknowlegement

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Declaration of conflicting interests: The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Ethical approval: the retrospective study with the permission from the chairman of the Department of Oral and Maxillofacial Surgery, Mahidol University

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International Abstract

How Do Dental Students Determine Patients' Caries Risk Level Using the Caries Management By Risk Assessment (CAMBRA) System?

Doméjean S, Léger S, Rechmann P, White JM, Featherstone JD.
J Dent Educ. 2015 Mar;79(3):278-85.

Abstract

Research has demonstrated the validation of specific caries risk assessment (CRA) systems, but little is known about how dental practitioners assign a caries risk level to their patients. The aim of this study was to explore dental students' decision making in caries risk assignment when using the Caries Management By Risk Assessment (CAMBRA) system. Multiple correspondence analysis and chi-squared automated interaction detector analysis were performed on data collected retrospectively for a period of six years (2003-09) at the University of California, San Francisco predoctoral dental clinic. The study population consisted of 12,952 patients from six years of age through adult who received a baseline CRA during the period, were new to CAMBRA, and had not received any prior CAMBRA recommendations. The results showed variation in decision making and risk level assignment, illustrated by the range of percentages for the three scores (low, moderate, and high/extreme caries risk) when CRA was assigned for the first time. For those first-time CRAs, decision making was mainly based on four factors: cavities or caries lesions into dentin on radiograph, restorations during the last three years due to caries, visible heavy plaque, and interproximal lesions into enamel (by radiographs). This study's findings provide important data regarding one group of CAMBRA users and thus contribute to the development of knowledge about the implementation of caries risk assessment in contemporary dental practice.

Keywords:

biological risk factors; caries; caries risk assessment; clinical decision making; clinical education; dental education; disease indicators; protective factors

Efficiency of caries risk assessment in young adults using Cariogram.

Celik EU1, Gokay N, Ates M.
Eur J Dent. 2012 Jul;6(3):270-9.

Abstract

Objective:

THE AIMS OF THIS STUDY WERE TO: (1) evaluate the caries risk in young adults using Cariogram and (2) compare the efficiency of Cariogram with the regression risk models created using the same variables in Cariogram by examining the actual caries progression over a 2-year period.

Methods:

This study included 100 subjects that were either twenty or twenty-one years-old. Data on general health, diet, oral hygiene and use of fluoride were obtained. Saliva analyses were performed, including mutans streptococci and lactobacilli counts, secretion rate and buffer capacity. DMFT and DMFS values were calculated by clinical examinations and radiographs. The participants were divided into 5 groups according to their Cariogram caries risk scores at baseline. Re-examination for caries was done after 2-years. The data were analyzed using Kruskall Wallis, Mann Whitney-U, and logistic regression analyses.

Results:

Diet frequency, plaque amount and secretion rate were significantly associated with caries increment (P<.05). Cariogram and the regression risk models explained the caries formation at a higher rate than single-variables. However, the regression risk model developed by diet frequency, plaque amount and secretion rate explained the caries formation similar to Cariogram, while the other regression model developed by all variables used in Cariogram explained the caries formation at a higher rate than this computer program.

Conclusions:

Cariogram is effective and can be used for caries risk assessment instead of single variables; however, it is possible to develop simplier models with regression analyses to determine caries risk.

Keywords:

Caries risk; Cariogram; caries risk model; risk factor

Cyclic Fatigue Resistance of 3 Different Nickel-Titanium Reciprocating Instruments in Artificial Canals.

Higuera O1, Plotino G2, Tocci L2, Carrillo G1, Gambarini G 2, Jaramillo DE3.
J Endod. 2015 Mar 11. pii: S0099-2399(15)00075-8. doi: 10.1016/j.joen.2015.01.023.

Abstract

Introduction:

The purpose of this study was to evaluate the cyclic fatigue resistance of 3 different nickel-titanium reciprocating instruments.

Methods:

A total of 45 nickel-titanium instruments were tested and divided into 3 experimental groups (n = 15): group 1, WaveOne Primary instruments; group 2, Reciproc R25 instruments; and group 3, Twisted File (TF) Adaptive M-L1 instruments. The instruments were then subjected to cyclic fatigue test on a static model consisting of a metal block with a simulated canal with 60° angle of curvature and a 5-mm radius of curvature. WaveOne Primary, Reciproc R25, and TF Adaptive instruments were activated by using their proprietary movements, WaveOne ALL, Reciproc ALL, and TF Adaptive, respectively. All instruments were activated until fracture occurred, and the time to fracture was recorded visually for each file with a 1/100-second chronometer. Mean number of cycles to failure and standard deviations were calculated for each group, and data were statistically analyzed (P < .05). Instruments were also observed through scanning electron microscopy to evaluate type of fracture.

Results:

Cyclic fatigue resistance of Reciproc R25 and TF Adaptive M-L1 was significantly higher than that of WaveOne Primary (P = .009 and P = .002, respectively). The results showed no statistically significant difference between TF Adaptive M-L1 and Reciproc R25 (P = .686). Analysis of the fractured portion under scanning electron microscopy indicated that all instruments showed morphologic characteristics of ductile fracture that were due to accumulation of metal fatigue.

Conclusions:

No statistically significant differences were found between the instruments tested except for WaveOne Primary, which showed the lowest resistance to cyclic fatigue.

Keywords:

Cyclic fatigue; NiTi instruments; cyclic fatigue test; reciprocation