Radiographical Errors in Dental Students Work

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Abstract*: Background: Radiography is useful in the diagnosis and treatment planning of various oro-facial pathologies. Changes in the quality of radiographs may lead to misinterpretation, resulting in incorrect diagnosis and treatment planning, Aim of the study:To evaluate the prevalence of radiographical errors in intraoral films taken by undergraduate dental students. Material and method: 950 dental radiographs taken by undergraduate students were retrieved from archives and examined. Patient's age ranged between (5 – 68) years. Female patients were 473and males were477. X ray films were examined on x-ray film viewer and classified according to type of film, type of errors and area examined. Results and discussion: Higher percentage of errors were found in males than females, higher in peri-apical than bitewing and occlusal films, higher percentage of errors were found in posterior area than anterior area, and the most common error is conecut. Conclusion: The dental radiographer must be able to recognize and identify the causes of exposure and technique errors, and must know what steps are necessary to correct such errors,we can reduce these errors by increasing the training course for students and by using film holder.*

Keywords: radiographical errors, dental students

1. Introduction

Radiography is one of the useful tools employed in the diagnosis and treatment planning of various oro-facial pathologies. Changes in the quality of radiographs may lead to misinterpretation, resulting in incorrect diagnosis and treatment planning [1].

Intra oral images can be divided into three categories: Periapical projections, bitewing projections and occlusal projections. Periapical radiograph should show all of a tooth, including the surrounding bone. Bitewing images show only the crown of the teeth and the adjacent alveolar crests. Occlusal images show an area of teeth and bone larger than Periapical images [2].

A diagnostic dental radiograph is one that has been properly placed, exposed, and processed; errors in any one of these three areas may result non diagnostic film. Film exposure problems include films that are not exposed, accidentally exposed to white light, over exposed, or under exposed. All these errors produce non diagnostic radiographs that are too light or too dark. Technique errors include film placement, angulation, and PID alignment problems. Miscellaneous technique errors include film bending, film creasing, double exposure, patient movement, and reversed film. [3].

The dental radiographer must be able to recognize and identify the causes of exposure and technique errors. In addition, the dental radiographer must know what steps are necessary to correct such errors[3].

2. Material and Method

About 950 dental radiographs taken by undergraduate students (from 2013 to 2016) in radiology clinic oral diagnosis department / college of dentistry / university of Baghdad were retrieved from archives and examined. Patient's age ranged between (5 – 68) years. Female patients were 473(49%) and maleswere 477 (51 %).

X ray films collected, examined on x-ray film viewer and classified according to gender, type of film, type of errors and area examined.

3. Results

The Sample of study consist of 950 intra oral films, (473) for females and (477) for males. Males had more radiographical errors compared to females, About 180 errors had been found. As shown in table [1].Intra oral films classified according to type of film into Periapical , bitewing and occlusal film, the higher percentage of errors had been occur in Periapical film. As shown in table [2].

Examined areas classified into anterior and posterior teeth, the higher percentage occur in posterior area. As shown in table [3]. Radiographical errors classified into [Conecut(the most common one 24.6 %) followed by elongation, overlapping, dark film, pale film, fingerprint, shortening, position of the dot, blurred film, brown discoloration, double exposure, blank film (least one 0.1 %)]. As shown in table [4].

Table 1: Prevalence of radiographical errors according to gender

Gender	normal films		error films	
	Number	Percentage %	Number	Percentage %
Female	322	33.89	151	15.89
Male	297	31.26	180	18.94
Total	619	65.15	331	34.83

Table 2: Prevalence of radiographical errors according to type of film

Type of film	normal films		error films	
	Number	Percentage %	Number	Percentage %
Periapical film	395	41.57	231	24.31
Bitewing film	150	15.78	36	3.78
Occlusal film	74	7.78	64	6.73
Total	619	65.13	331	34.82

Table 3: Prevalence of radiographical errors according to area examined

Teeth examined	normal films		error films	
	Number	Percentage %	Number	Percentage %
Anterior teeth	195	20.52	55	5.78
Posterior teeth	386	40.63	210	22.10
Anterior and posterior	38	4	66	6.94
Total	619	65.15	331	34.82

Table 4: Type and prevalence of radiographical errors

Type of error	Number	%
Conecut	234	64.81
Elongation	27	7.47
Overlapping	16	4.43
Dark film	18	4.98
Pale film	15	4.15
Finger print	9	2.49
Shortening	6	1.66
Position of the dot	5	1.38
Blurred image	4	1.10
Brown discoloration	24	6.64
Double exposure	2	0.55
Blank film	1	0.27
Total	361	100

4. Discussion

This study done to evaluate the prevalence of radiographical errors in intra-oral films done by under-graduated dental student. From total 950 films, about (331) films contain different radiographical errors were found and the percentage was (34.84 %).

Crandell[4] conduct a study and found the most errors caused by improper placement of film followed by incorrect vertical and horizontal angulation, these results agreed with the results of present study.

Bean et al [5] reported 25% radiographical errors while the result of the present study showed 34.84% radiographical errors, this disagreement may be due to different sample size, different technique and different training course.
In this study of Jague et al [6] the result were (64.9% Conecut, 4.6% incorrect horizontal angulation) these result agreed with the result of present study.

Felippe et al [7] conduct a study and found highest frequency of processing errors followed by errors in film position and these results disagreed with the result of present study which may be due to different training course of students or the processing may be done without a help of assistance.

In this study of Haghnegahdar, et al [8], the prevalence of radiographicalerrors and the results showed (35.4% incorrect film placement, 16.6% incorrect horizontal angulation and 14.4% incorrect vertical angulation) and it's disagreed with the result of present study because of different sample size, different training course and different cooperation of patients.

In this study of Arachchi et al [9], the prevalence of radiographical errors in different site in oral cavity were evaluated and the results showed (48% in molar teeth and 24.1 in anterior teeth) and it's agreed with the result of present study .

In 2016 a study conducted by Elangovan[10] and the results found were (26.1% Conecut , 25.2% improper vertical angulation , 23.2% film position ,13.1% improper horizontal angulation , 9.5% processing errors and 2.9% from other errors) and these result disagreed with the result of present study because of different sample size , different student's level and different machine efficacy.

5. Conclusion

The most common radiographical error found among the undergraduate dental students work is Conecutand the least on is blank film. The most common errors found in posterior teeth and Periapical film type. We can reduce these errors by increasing the training course for students and by using film holder.

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