

Radiographic findings in panoramic radiographs of patients attending Kulliyah of Dentistry, IIUM

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Abstract

This research was done to study the radiographic finding of the jaws amongst the patients attending at the polyclinic using Orthopantomograph (OPG). The OPG was taken using the Planmeca Promax 3D and the Planmeca Romexis software (Version 2.1.1.R). The first step was collecting all the OPG images from 1st April 2009 until 31st January 2011. Then, the abnormal radiographs were further divided into 3 groups which were radiolucent, radiopaque and mixed. This classification includes site, size, border, and possible diagnosis as part of the lesion's appearance. One thousand four hundred and five OPG images were retrieved, 96 images were discarded because of poor quality. The data collected were analyzed statistically by using SPSS Version 16.0. Among 77 abnormal radiographic images, 41 images were radiopaque, 30 images were radiolucent and 6 images were mixed. Out of 77 abnormal images, 34 images that showed bone lesion were from male patients while the rest which was 43 images from female. In conclusion, most of the pathological lesion occur in the mandible.

Keywords: Panoramic, radiograph, jawbone, lesion

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Introduction

Radiograph as a method of investigation plays an important role in making diagnostic decision in determining the diseases. Each individual that need radiographic examination are based on findings from dental history and clinical examination and customized by age and general health of the patient (*Sirisha et al.*, 2013). Thus, radiographs mostly referred to as the clinician's key of diagnostic support (*Lee et al.*, 2013). Besides that radiographs are ordered when dentist sought that the radiographs will provide helpful diagnostic information which will affect the treatment plan (*Kapila et al.*, 2011). However, lesions inside the jaw are sometimes accidentally discovered by the dentist during routine examination.

Oral lesions is always a challenge for clinician and based on the experience, constructing a final diagnosis can be complicated and easily misinterpreted.

Many of the oral pathological lesions cannot be viewed clinically, and the indication for dental radiograph can provide important information on a patient's oral health and general health. (*Diz et al.*, 2013).

Panoramic imaging is a two dimensional radiographic technique for producing a single 2D tomographic image of the facial structures that include both maxillary and mandibular dental arches and their supporting structures (*Subbulakshmi, et al.*, 2016). Besides that, the panoramic imaging produces a

single image of a complete representation of the jaws, teeth, temporomandibular joint, alveolar lobes of the maxillary sinuses. This image forms when two adjacent disks are rotating at the same speed in opposite directions as an X-rays been passed through their centers of rotation.

Lesion is defined as a pathologic disturbance of a tissue, with loss of continuity, enlargement, or function (Regezi, Sciubba, & Jordan, 2015). The most common jaw lesions are cyst and tumours. A cyst is defined as an epithelium lined pathologic cavity (Deepthi *et al.*, 2016). On the other hand, tumour of the jaw can be divided by 2 categories; odontogenic and non-odontogenic tumour. As the name implies, odontogenic tumour is the tumour that derived from the tooth structure related to the tooth while non-odontogenic tumours are the most common neoplasm of the jaw (Zegalie, Speight, & Martin, 2015).

The radiographic jaw lesions can be describe as having either a radiolucent, radiopaque or mixed appearance, relative to density of the adjacent bone which more than 80% of them is radiolucent (Ed, 2017). It can be multilocular or unilocular with well-defined or poor defined border. In general, lesions with well-defined borders are usually benign whereas poor defined borders invariably represent aggressive, inflammatory or neoplastic process (Hall, 2017).

This research is primarily concerned with the radiographic study of bone lesions found in patients coming to the polyclinic of the Kulliyah of Dentistry, IIUM. The prevalence of bone lesions in patient will be analyzed based on the radiograph that had been taken beginning from the patient registered 1st April 2009 until 31st January 2011.

Thus, the objectives of this study were to find out the prevalence of bone lesions in patients attending polyclinic, Kulliyah of Dentistry clinics through OPG, its radiographic findings and to assess the most common radiographic lesions and location.

In addition the study was done in order to set a potential data base on bone lesions in patients attending KOD, IIUM.

Material and Methods

A retrospective cross-sectional study was done to assess the prevalence of radiographic bone lesion in the patient coming to the Kulliyah of Dentistry, IIUM. The approach of the study is quantitative, by collecting data (radiographic images) taken in this Kulliyah from 1st April 2009 until 31st January 2011. It is appropriate to use cross sectional study because this study involve different group of people coming to the polyclinic, Kulliyah of Dentistry.

The total number of collected radiographs (OPG) in the polyclinic is 1405. The images collected had been and screened for any abnormalities by two specialists in Oral maxillofacial pathology and Oral maxillofacial surgery due to the absence of maxillofacial radiologist. The data was collected by using the Planmeca Promax 3D and the Planmeca Romexis software version (2.1.1.R). The radiographs that has artifact, ghost image, distorted and blurred will be excluded from the study. After data has been collected and was visually checked for correction, the data was analyzed using SPSS Version 16.0.

Results

Out of the 1,405 OPG collected, 96 OPGs were excluded from the study due to technical defects and 1,309 were included. The number of radiographs with radiographic lesions were 77 and the rest, 1,232 were presented with normal radiographic findings. Out of the 77

images, 34 (44.2%) images showed bone lesion were from male patients and 43 (55.8%) were female. Regarding the race, the data showed that Malay patients were the highest 67 (87%), followed by 9 (11.7%) of Chinese and only 1 (1.3%) Indian respectively)

The prevalence of radiographic lesions of the jawbone in this study was 5.9%.

Table 1 shows the radiographic presentation radiolucent lesions were 30 (39%), (Figure 1) and radiopaque lesions were 41 (53.2%), (Figure 2). The remaining 6 (7.8%) were mixed lesions (Figure 3).

Sixty five radiographic lesions were found in the mandible, 37 on the right

body and seven on the left body. However, less lesion occurred in the maxilla as shown in Table 2.

Most of the radiographic bone lesions found in this study had a well-defined margin which was 63 (81.8%) and the rest 14 (18.2%) were not clearly defined. Most of bone lesions 71 (92.2%) appeared as unilocular, whereas six (7.8%) were presented as multilocular.

Size of lesions were divided into 4 groups, small (2.5-7.5mm), (62%), moderate (7.6-10mm), (21%) and large (above 10 mm). (17). Minimum size observed was 2.5 mm, and the maximum size was 19 mm, mean value was 7.344 and standard deviation was 3.19.



Figure 1. Panoramic radiograph showing a radiolucent lesion in the lower anterior region of the mandible.



Figure 2. Panoramic radiograph showing radiopaque lesion in the lower left and right body of the mandible.



Figure 3. Panoramic radiograph showing a mixed radiolucent- radiopaque lesion in the lower posterior right angle of the mandible.

Table 1. Distribution of different types of radiographic lesions according to gender, loculation and appearance.

Total	Gender		Loculation		Appearance		
	Male	Female	Uni-locular	Multi-locular	Radiolucent	Radiopaque	Mixed
25 (36.4%)	17 (22%)	11 (14.3%)	28	0	28 (93%)	0	0
5 (6.5%)	1 (1.3%)	4 (5.2%)	5	0	0	5 (12.2%)	0
25 (32.5%)	9 (11.7%)	16 (20.8%)	23	2	0	25 (61%)	0
3 (3.9%)	1 (1.3%)	2 (2.6%)	1	2	1 (16.7%)	2 (4.9%)	0
3 (3.9%)	2 (2.6%)	1 (1.3%)	3	0	0	3 (7.3%)	0
13 (16.9%)	4 (5.2%)	9 (11.7%)	11	2	2 (6.7%)	6 (14.6%)	5 (53.3%)
77 (100%)	34 (44.2%)	43 (58.2%)	71	6	30 (100%)	41 (100%)	6 (100%)

Table 2. Site of radiographic lesions seen in OPG

Site	Lesions	Percentage (%)
RT mandible ramus	1	1.3
RT mandible body	36	46.8
LT mandible ramus	3	3.9
LT mandible body	25	32.5
RT maxilla posterior	3	3.9
RT maxilla anterior	4	5.1
LT maxilla posterior	2	2.6
LT maxilla anterior	3	3.9
Total	77	100

Discussion

Based on the result, it showed that 77 (6.78 %) among 1232 patients attending the dental clinic of Kulliyah of Dentistry, IIUM, have jaw lesion. From all the patients having jaw lesion, 44.2 % were male and 55.8 % were female. The result may not show the exact number of the lesions affecting each gender since certain diseases are related to gender. For instance, in odontogenic kerato cyst, the

ratio of male to female is 2.1 to 1.2 (Al-Moraissi et al., 2017).

The characteristic appearance of each lesion varies, and it was categorized into three; radiolucent, radiopaque and mixed radiolucent and radiopaque. From the collected results, the radiopaque lesion was the highest among the collected sample with a percentage of 53.2 %, however, Eldaya in 2017 stated that more

than 80 % of the lesions should be of radiolucent (Eldaya et al., 2017).

In this study, the mandible was found to be affected by (84.5 %) of the jaw lesions. Similarly, Araki *et al.* (2011) found that radiopaque lesions were mostly found in molar and premolar region of mandible.

Conclusion

This study showed that 6.25 % of the radiographs exhibited pathological lesions. Moreover, most of the lesions were discovered accidentally in the radiograph. More studies are recommended with a larger sample size. In conclusion, most of the pathological lesion occur in the mandible, and less in the maxilla.

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