

EVALUATION OF EDENTULOUS PATIENTS ON PANORAMIC RADIOGRAPHIC: A RADIOGRAPHIC SURVEY STUDY

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ABSTRACT:

Aims and objectives: The purpose of this article is to report a panoramic radiography study of edentulous patients with emphasis on the incidence of six entities root fragments, retained teeth, radiolucencies, radiopacity, foreign bodies, elongated styloid process, and mental foramina at or near crest of residual ridge.

Materials and methods: In our present study a total of 150 edentulous patients reporting to the OPD during 1 year period from 2011-2012 were included. Then all patients were subjected to panoramic radiograph using digital Panoramic machine. All the radiographs were evaluated by 2 Oral radiologists, for the following clinically significant radiographic finding: retained root fragments, impacted teeth, radiolucencies, radiopacity, elongated styloid process, mental foramina at alveolar crest. Any abnormalities were documented and quantitatively studied. Categorical data was transferred to computer and software SPSS 17.0 was used and analyzed by Chi-square test for associations. The p value ≤ 0.05 is considered significant.

Results: The study was conducted on 150 subjects of whom, 98 patients were male and 52 females. The mean age of the subject was 59.6 ± 6.63 in male and mean age for female was 58.7 ± 4.5 . Out of 150 patients 17 patients had positive findings of root fragments, Radiopacity was attributed by 11.76% to the 85 positive findings accounting to 6.6% of total patients. A statistically significant result was obtained between male and female with p value of 0.05 when compared for position of mental foramen at crest level. The percentage was calculated in relation to 85 positive findings which resulted that 22.6% of cases had 40% of mental foramen positioned at alveolar crest level in radiographs. Out of 98 males, 4 patients had impacted tooth. The percentage with total positive findings was seen in only 4% of cases with 7.05% of impacted teeth and there was no radiolucent and foreign body entity examined in radiograph.

Keywords: orthopantomograph, edentulous, radiolucencies, radiopacity, foreign bodies



INTRODUCTION

If successful treatment is to be obtained in removable prosthodontics, it is imperative that patients have a good foundation of oral structure to start the treatment procedure. A complete knowledge of existing oral conditions, treatment becomes empirical and unreliable. Along with oral examination, Panoramic radiography is commonly used in many institution practice as the

sole method of screening edentulous patients. Panoramic radiograph provides a rapid and effective method of screening edentulous patients suspect areas may then be examined in detail, several studies have indicated that panoramic radiography is of special value in diagnosis and treatment planning.^[1]

The edentulous alveolar ridge of patients presenting for prosthetic rehabilitation are often not suspected of having any underlying pathological conditions. Clinical examination too fails to reveal evidence of any retained roots , unerupted tooth foreign bodies, and radioopaque pathologies which can obscure in denture fabrication.^[2] Numerous radiographic studies have been made of edentulous and partially edentulous patients. Since then there have been many studies that have helped to detect and localize radiological findings such as retained teeth, root stumps, periapical infection, cysts, osseous alteration and foreign bodies. But due to concern over potential hazard ,it has been argued that only patients presenting with clinical evidence should undergo radiographic examination, but the discoveries of complicating conditions in various studies indicates radiographic examination of edentulous patients by FDA and ADA and selection criteria which was given by Matteson in 1987 stating a full mouth intraoral or panoramic radiographs for newly edentulous patients.. Similar studies have been conducted in different parts of the world like USA, Australia ,Canada, Iran ,Saudi, Africa, Greece, Finland but no such study has been documented in Southern India.^[3,4,5,6,7] The objectives of this study is to assess radio graphically edentulous patients with emphasis on the oral findings like root fragments retained teeth, radiolucencies, radiopacity, foreign bodies, elongated styloid

process, and mental foramina at or near crest of residual ridge among patients reporting to dental college for denture.

Aim: The purpose of this article is to report a panoramic radiography study of edentulous patients with emphasis on the incidence of six entities root fragments, retained, teeth, radiolucencies, radiopacity, foreign bodies, elongated styloid process, and mental foramina at or near crest of residual ridge.

Objectives:

1]To evaluate and compare presence of root fragments among male and female.

2]To evaluate and compare mental foramina at crest between male and female.

3]To evaluate and compare radiolucencies between male and female.

4]To evaluate and compare radiopacities and compare between male and female.

5]To evaluate and compare foreign bodies in edentulous patients between male and female.

6]To evaluate and compare elongation of styloid process and compare

7]To compare edentulous patients between male and female.

8]To evaluate impacted teeth and compare between male and female.

MATERIALS AND METHODS

In our present study a total of 150 edentulous patients reporting to the OPD of Department of Oral Medicine and Radiology during 1 year period from 2011-2012 were included after obtaining ethical committee clearance. The edentulous patients were reporting for either fabrication of a new denture or for correction of any problem associated with the previous dentures. All patients were selected randomly. The clinical examination was carried out and then the radiographic procedures along with its aim and objectives were explained to the patients verbally and written consent was obtained for performing radiographic examination. Then all patients were subjected to panoramic radiography using digital Panoramic machine (Kodak 8000 c) with Kvp of 60-75 and standard 10 Ma, exposure time was standard 17 seconds. All the radiographs were evaluated by 2 Oral radiologists, for the following clinically significant radiographic finding: retained root fragments, impacted teeth, radiolucencies, radiopacity, elongated styloid process, mental foramina at alveolar crest. Any abnormalities were documented and quantitatively studied. Categorical data was transferred to computer and software SPSS 17.0 was used and analyzed by Chi-square test for associations. The p value ≤ 0.05 is considered significant. Clinically evident root fragments and patients not willing to participate in the study were excluded from study.

RESULTS:

The results and observation is interpreted in Table 1 [Mean age], Table 2 [Total Positive findings in 6 entity], Table 3 [Percentage of cases and radiographic entity]. The study was conducted on 150 subjects of whom, 98 patients were male and 52 females. The mean age of the subject was 59.6 ± 6.63 in male and mean age for female was 58.7 ± 4.5 . as shown in [table 1].

1) Root fragments: 17 patients had positive findings of root fragments. 11.3% of patients had positive findings of 20% of root fragments observed in 17 patients which is second highest commonest finding out of total 85 positive findings. [Table , 2 & 3]. Figure 1 shows a retained root fragment in 16 area and another opg reveals multiple root fragments in one patient.

2) Radiolucencies: No radiolucent pathologies were found in both males and females.

3) Radiopacity: Evaluation of opg for 150 patients resulted in significant findings. 18 patients had elongated styloid process. This radiographic entity was observed in 12% of cases and 21.7% had positive findings out of 85 total positive findings when percentage was calculated. [Figure 3] One male patient was diagnosed radiographically as phlebolith [Figure 6] in right side of mandible. Other observation which was found was osteosclerosis in 7 patients were located in posterior area

of both jaws. One patient had osteoma in maxillary sinus, another patient had fractured right condylar head [figure 5] and one female patient had complex odontome [Figure 2] radiographically and in one patient radiopacity was diagnosed as tonsilolith radiographically [Figure 4]. When compared between male and female there was no statistical significant difference found. Radiopacity was attributed by 11.76% to the 85 positive findings accounting to 6.6 % of total patients. As shown in [table 2, 3].

4) Foreign body: There was no foreign body diagnosed radiographically in both men and women edentulous patients.

5) Mental foramen at crest: It was observed that out of 98 patients 34 patients had mental foramen positioned at alveolar crest level and mental foramina positioned at crest area. A statistically significant result was obtained between male and female with p value of 0.05 when compared for position of mental foramen at crest level. The percentage was calculated in relation to 85 positive findings which resulted that 22.6% of cases had 40% of mental foramen positioned at alveolar crest level in radiographs. [Table 2, 3] and [Figure 7 shows resorption of alveolar ridge on OPG]

6) Impacted teeth: Out of 98 males, 4 patients had impacted tooth where most common area was in posterior region and out of 52 females 2 patients had impacted teeth which were also in

posterior area of both jaws. The percentage with total positive findings was seen in only 4% of cases with 7.05% of impacted teeth. [Table 2, 3] and figure 8 shows impacted 38 on opg].

DISCUSSION :

This study demonstrated and emphasized the need for radiographic examination of the edentulous patients before constructing complete dentures. with emphasis on the incidence of root fragments, radiolucencies, radiopacity, foreign bodies, impacted teeth, and mental foramen position which was followed by John 1985.^[2]

The present study included 150 patients with clinically diagnosed maxillary and mandibular edentulous alveolar ridge. In this study out of 150 patients. The mean age of the subject was 59.6 ± 6.63 in male and mean age for female was 58.7 ± 4.5 . Similar findings were reported by Jindal et al [2011] where in his study out of 525 patients 55% were males and 45% were females with mean age of 58.0 ± 10.45 .^[6]

In our study out of 150 of edentulous patients a total of 85 [56.5 %] of positive findings were observed in radiograph which was similar to findings by study carried out by Bremner and Grant who reported 38% of positive findings and another study reported 32% which was done by Jindal.^[8,9]

.A 11.3% of patients had positive findings and 20% of root fragments were

observed in 17 patients out of total of 85 positive findings, which was secondmostcommonst findings in our study. The findings was similar to the study done by Dias where he reported commonest site of root stumps were in right and left maxillary posterior segments from 97 patients within total of 66 retained root fragments.^[2] Whether retained root fragments ,teeth should be removed is debatable. According to Enis every retained root as a threat to the health of the patients and recommended that all retained roots should be removed. In contrast according to Guyer the decision to surgically remove retained roots has been provided by the submerged root concept. The clinical and histological evidence presented these studies indicate that no infected vital roots completely submerged within the alveolus may be a way of preserving alveolar bone for the support of complete dentures.^[9,10,11]

This study concluded with no positive findings in relation to radiolucencies which was in contrast to study carried out by Dias where he reported 11% of total positive findings in 97 patients^[2]. In another study carried out by Jindal reported 13% of patients had radiolucienes.^[9]

According to Jones if radiolucencies are observed it should be further evaluated clinically and radiographically and biopsies should be made if a lesion appears suspicious or it may be observed periodically to detect possible changes in location or size that could endanger the

patients health or affect the fit of the dentures.^[1]

In respect to foreign bodies there was no positive findings in our study which was in contrast to studies done by Storer who reported 0.4% to 6.9 % of edentulous patients had fragments of amalgam and in another study 2 patients had five charm needles in soft tissue which was reported in study done by Dias.^[12]

The radiopaque entities in 150 patients was subdivided into elongate styloid process, osteosclerosis and any other radiopacity like sialolith, lymph node calcification, phlebolith, and osteoma. 18 patients (12% of case) had elongated styloid process (21.7% in 85 positive findings) where most of the patients were male (n= 13) and females (n=5).^[14.] Other observation which was found was osteosclerosis in 7 patients in which most of the patients were females (n=5) and osteosclerosis was observed in posterior area. When compared between male and female there was no statistical significant difference found. When percentage was calculated out of 85 positive findings 6.6% of patients had 11.76% of radiographic findings. In another study done by Jindal reported 54 radiopacities in patients out of which were maximum diagnosed as osteosclerosis ,17 cases of radiopacity as calcification in lymph node, tonsilolith, calcification in mucosa, 1 was dignosed as silolith, 1 as osteoma. Other findings observed in our present study were One male patient

had osteoma in maxillary sinus, another patient had fractured right condylar head and one female patient had lymph node calcification which are interesting findings.^[9]

The relationship of mental foramen to the crest of residual ridge is very important as compression of denture can cause numbness or pain if the position is at crest level. When mental foramen at crest was observed out of 98 patients 27 males had mental foramen positioned at crest level and out of 52 female patients only 7 patients had mental foramina positioned at crest area with a total of 34 positive findings. A statistically significant result was obtained between gender and mental foramen with p value of 0.050 when compared. The percentage was calculated in relation to 85 positive findings which resulted that 22.6% of cases had 40% of radiographic findings. These findings were in contrast to study done by Jindal where he observed only 9 patients had position of mental foramen at crest in which 5 patients were male and 4 females.^[9]

The impacted teeth are one of the most important aspects to be considered in edentulous patients as it can obscure with denture. These impacted teeth can transform into cyst and tumors. In our study 6 patients had impacted teeth where posterior teeth in relation to mandible were commonly observed and 1 female patient had impacted central incisor. 11 of the edentulous person had

retained teeth in previous studies done by Ennis and Storer. In another study done by Soikkonen he observed impacted teeth only in women and most commonly were posterior teeth. Patient should be therefore be informed about the risk and the necessity of radiographic examination at regular interval should be stressed.^[11,1,13]

Limitations of study: The sample size in our study is less when compared to other previous studies and inter observer variability can lead to misinterpretation of radiographic findings.

CONCLUSION:

Radiological assessment of patients before getting prosthesis is essential. As in our study the position of mental foramen was seen at the alveolar crest level, which is significant findings in treatment planning. The root piece were also seen in few patients, which is still a debate among authors as few suggest of retaining root piece could help in maintaining the integrity of alveolar ridge but few disagree to this and suggest removal of root piece if patients has systemic diseases like diabetes which can act as source of infection. The foreign bodies are also important findings in edentulous patients however in our study no cases were reported. Thus this study serves as guidelines for Dentist in prosthetic rehabilitation treatment.

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FIGURES

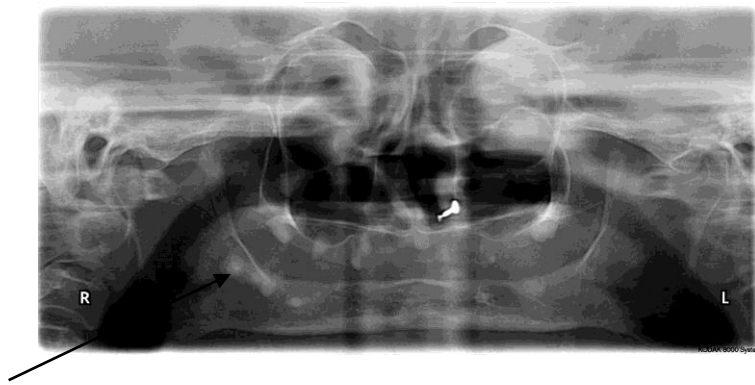


FIGURE 1 ROOT FRAGMENTS

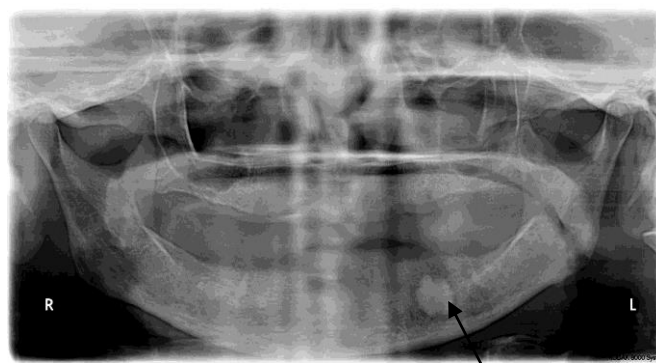


FIGURE 2 COMPLEX ODONTOMA IN 36 REGION



FIGURE 3 ELONGATED STYLOID PROCESS



Figure 4 TONSILOLITH IN LEFT RAMUS AREA

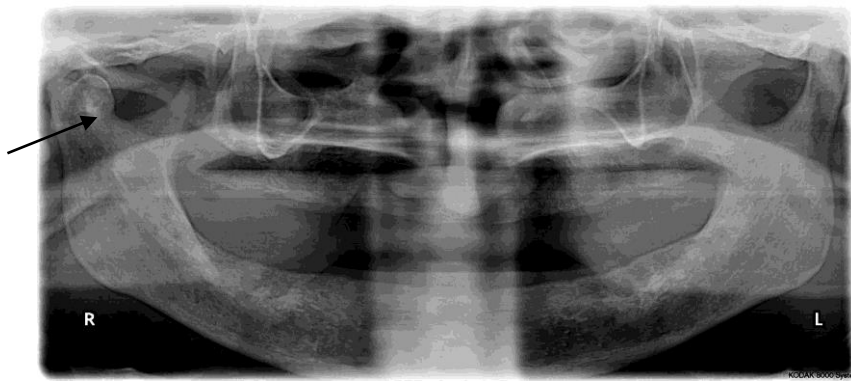


Figure 5 CONDYLAR FRACTURE RIGHT SIDE

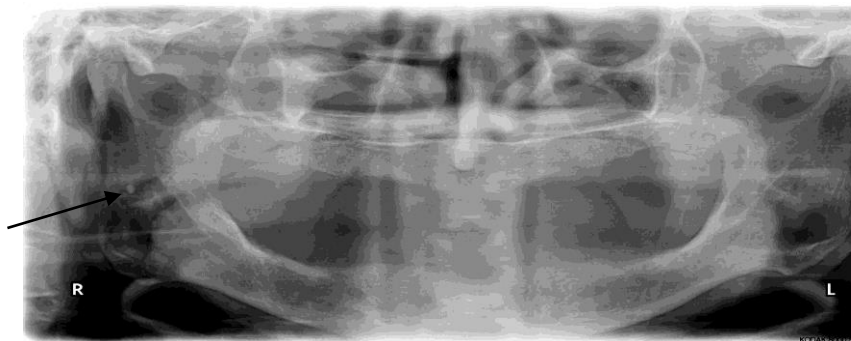


Figure 6 PHLEBOLITH RIGHT RAMUS AREA

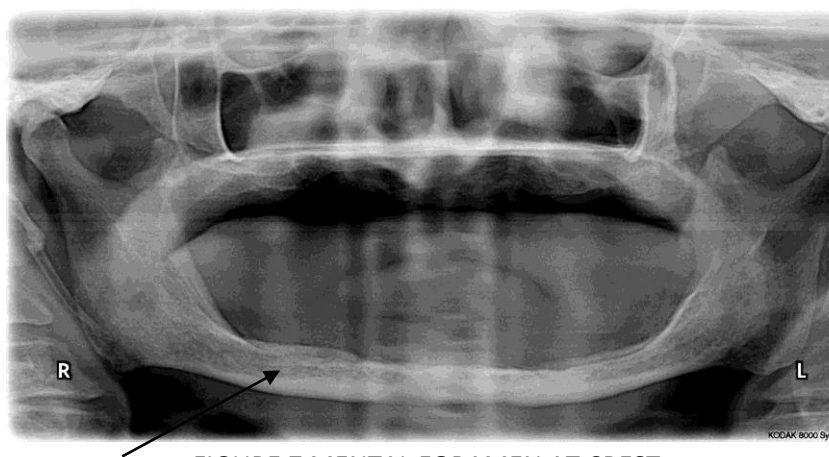


FIGURE 7 MENTAL FORAMEN AT CREST

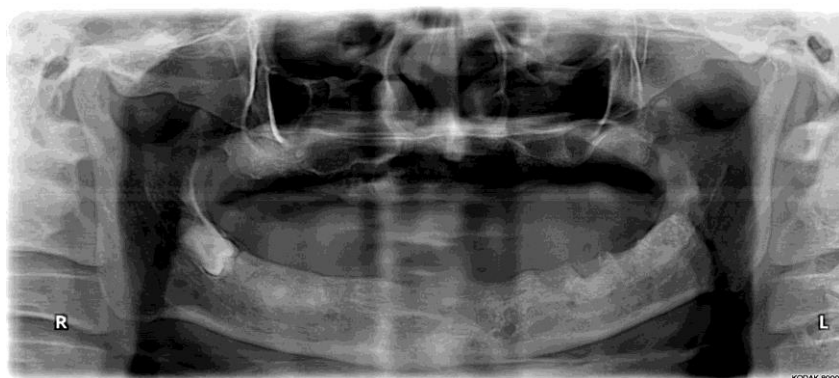


FIGURE 8 IMPACTED 48 MOLAR