Panoramic Radiographic Examination: A Survey of 271 Edentulous Patients

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The aim of this study was to quantify the frequency of positive radiographic findings in edentulous arches. Panoramic radiographs from 271 patients who were edentulous in one or both arches were evaluated for the presence of retained root fragments, impacted teeth, foreign bodies, radiolucencies, radiopacities, mental foramina at or near the crest of the residual alveolar ridge, and maxillary sinus proximity to the crest of the residual alveolar ridge. One or more of these radiographic observations were found in 51.7% of the examined films. The most frequent finding (30.6%) was close approximation of the maxillary sinus to the crest of the ridge. These results underscore the importance of panoramic examination of edentulous patients in detecting potential problems before complete denture treatment. However, prescribing such an examination in patients seeking replacement dentures requires a thorough patient history and clinical examination. *Int J Prosthodont 2011;24:55–57.*

Panoramic radiography is of special value in the diagnosis and treatment planning for the removable prosthodontic patient. It provides a view of the entire maxillomandibular region on a single film, without inconveniencing the patient and with minimal time expenditure.[1] Pathologic changes that might not be detected during clinical examination are found in a high percentage of apparently healthy jaws.[2] In spite of its obvious diagnostic advantage, such a routine examination is currently being questioned because of the cumulative effects of radiation exposure and the limited influence of panoramic examination on surgical and prosthodontic treatment plans.[3,4] This study sought to quantify the frequency and location of positive radiographic findings in edentulous patients seeking replacement dentures.

Materials and Methods

Edentulous patients attending the Division of Removable Prosthodontics, King Abdulaziz University, Kingdom of Saudi Arabia, are routinely screened with panoramic radiographs before complete denture treatment. A frame of all panoramic radiographs (Orthopantomograph 10E, Siemens) taken from 2000 to 2010 was made; the total number of radiographs was 1,022. The inclusion criteria for patient selection were patients who were between 32 and 85 years of age, were edentulous in one or both arches, had been edentulous for at least 5 years, and patients with previous denture experience in either or both arches and were seeking fabrication of a new denture. The exclusion criteria consisted of poor quality radiographs and evaluator disagreement in interpretation of the radiographs. Considering both the inclusion and exclusion criteria for this study, 751 radiographs were omitted. Therefore, the final sample size was 271 radiographs. Based on a review of the literature, this sample size was comparable.[2]

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Table 1 Positive Radiographic Findings

Finding	Men (n = 155)	Women (n = 116)	Total (n = 271)
Maxillary sinus close to the crest of the ridge	49 (31.6%)	34 (29.3%)	83 (30.6%)
Mental foramen on the crest of the ridge	15 (9.7%)	23 (19.8%)	38 (14.0%)
Retained roots	19 (12.3%)	16 (13.8%)	35 (12.9%)
Radiopacities	6 (3.9%)	7 (6.0%)	13 (4.8%)
Radiolucencies	4 (2.6%)	2 (1.7%)	6 (2.2%)
Foreign bodies	3 (1.9%)	3 (2.6%)	6 (2.2%)
Impacted teeth	1 (0.6%)	1 (0.9%)	2 (0.7%)

Radiographs were examined by the authors and an oral radiology specialist using a standard viewer in a darkened room. Radiographs were evaluated for the presence of retained root fragments, impacted teeth, foreign bodies, radiolucencies, radiopacities, mental foramina at or near the crest of the residual alveolar ridge, and maxillary sinus proximity to the crest of the residual alveolar ridge. The patients' records were also reviewed to detect any evidence of clinical problems that might have interfered with the patient prosthetic experience that occurred because of these radiographic findings. Data were collected and analyzed using descriptive statistics.

Results

Of the 271 patients included in the study, 155 (57.2%) were men and 116 (42.8%) were women (mean age: 58.5 years). Two hundred ten (77.5%) patients were completely edentulous, 33 (12.2%) were edentulous in the maxilla, and 28 (10.3%) were edentulous in the mandible. Accordingly, this study included 481 edentulous arches. Positive radiographic findings were found in 140 (51.7%) patients, of which 76 (54.3%) were men and 64 (45.7%) were women. In 83 patients, the maxillary sinus was close to the crest of the ridge (Table 1), of which 10 patients had bilateral maxillary sinus involvement. Thirty-eight patients had a mental foramen close to the crest of the ridge (Fig 1), of which 6 patients had both mental foramina near the crest of the ridge. Thirty-five patients had a total of 48 retained roots, 26 of which were located in the maxilla (Fig 2). Radiopacities were detected in 13 patients and were interpreted as localized sclerotic bone formation (Fig 3). Radiolucencies were observed in 6 patients and were interpreted radiographically as residual periapical cysts in 4 patients and residual periapical abscesses in the other 2. Foreign bodies were found in 6 patients and were interpreted radiographically as amalgam particles. Impacted mandibular third molars were found in only 2 patients (Fig 4). The review of the patients' records failed to find any evidence of treatment that may have occurred because of these radiographic findings.

Discussion

Review articles have reported a remarkable number of pathologic findings from panoramic examinations of edentulous arches.[2] In this study, radiographic abnormalities were found in 51.7% of apparently healthy edentulous patients. This considerable incidence of positive findings points out the value of panoramic radiographic examination in revealing potentially complicating conditions before complete denture treatment. However, the presence of these radiographic abnormalities in approximately half of the participating patients did not call for any treatment modifications, and the patients appear to have worn their denture successfully, even if they showed positive findings. Consequently, the prescription of panoramic examination for edentulous patients seeking replacement dentures should be correlated to the patients' histories and clinical examinations. Specific indications for such an examination have to be identified based on the patients' individual needs. It is also essential that the patient be informed of the possible surgical and prosthetic procedures that may be necessary because of these potential problems. The patient's records should indicate the mutual decision made by the patient and clinician and that the patient was informed of the possible consequences.[5]

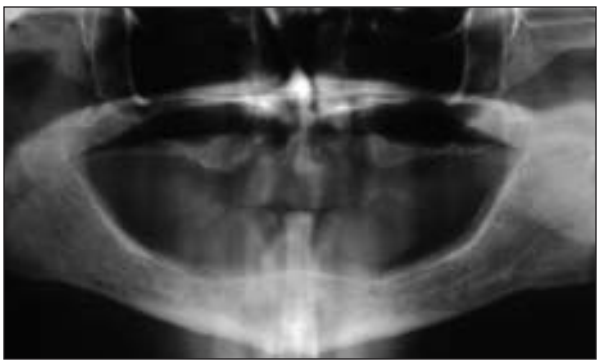

Fig 1 Bilateral maxillary sinus and bilateral mental foramen close to the crest of the residual ridge.

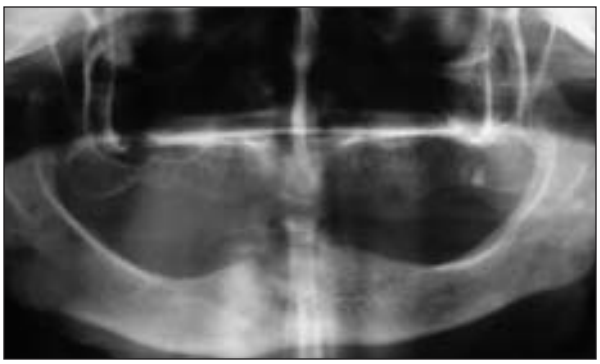

Fig 2 Root fragment in the maxillary left molar region.

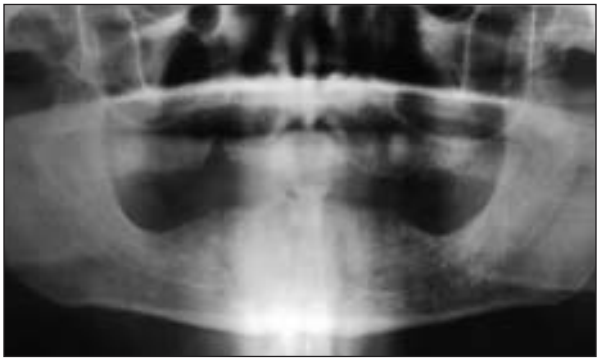

Fig 3 Localized radiopacity at the left side of the maxilla. A root fragment is also evident close to the crest of the residual ridge in the mandibular left second premolar and first molar region.

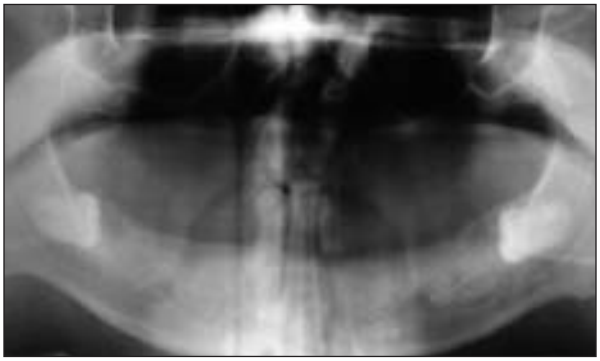

Fig 4 Bilateral impacted mandibular third molars.

Conclusion

The percentage of positive findings reported in this study underscores the value of panoramic examination of edentulous patients, especially for those patients who are to receive complete dentures for the first time. However, the decision to screen edentulous patients seeking replacement dentures should be made after obtaining a thorough patient history and clinical examination.

Acknowledgment

The authors wish to acknowledge Dr Khaled Allouba, Associate Professor, Department of Oral Diagnosis and Radiology, Taibah University, Al-Madinah, Kingdom of Saudi Arabia, for his invaluable contribution to the study.

References

1. White SC, Pharoah MJ. Oral Radiology: Principles and Interpretation, ed 3. St Louis: Mosby, 2003:191.
2. Masood F, Robinson W, Beavers KS, Haney KL. Findings from panoramic radiographs of the edentulous population and review of the literature. Quintessence Int 2007;38:e298–305.
3. Garcia RI, Valachovic RW, Chauncey HH. Longitudinal study of the diagnostic yield of panoramic radiographs in aging edentulous men. Oral Surg Oral Med Oral Pathol 1987;63:494–497.
4. Zeicher SJ, Ruttimann UE, Webber RL. Dental radiography: Efficacy in the assessment of intraosseous lesions of the face and jaws in asymptomatic patients. Radiology 1987;162:691–695.
5. Jones JD, Seals RR, Schelb E. Panoramic radiographic examination of edentulous patients. J Prosthet Dent 1985;53:535–539.

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