The value of pre-operative radiographic examination Of edentulous patients prior to denture construction: The risk versus the benefit

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Abstract

Many investigators recommended a routine radiographic examination for the edentulous cases before denture treatment. Panoramic radiographs obtained from inactive files of 212 patients -of both sexes- who required treatment in the college of dentistry KSU. The radiographs were meticulously examined. The plan of this study was to examine panoramic radiographs of edentulous patients with emphasis on the incidence of five entities: root fragments, impacted teeth, radiolucencies, radiopacities, and foreign bodies. Of the 212 panoramic radiographs examined, 180 were free of positive findings, and 32 (15.1%) have shown positive findings, eighteen patients (8.5%) had one or more remaining root fragments, and this entity was statistically significant from the other entities. Three patients (1.4%) demonstrated impacted teeth. Five patients (2.4%) demonstrated radiopacities, two patients (1.9%) demonstrated radioluencies. The radiographs of four patients (1.9%) demonstrated foreign bodies. The results of this study have proved the necessity of performing routine radiographic examination of the jaws for all edentulous patients before constructing complete dentures. It also indicates the need for a better extraction technique together with the use of radiographs before and after extraction.

Introduction

The need for radiographic examination of edentulous patients prior to denture construction was first reported by Logan and Eusterman in 1921 (1,2). From that time and till the mean time, many investigators recommended a routine radiographic examination for the edentulous cases before denture treatment. This is based on the relatively high frequency of the positive radiographic findings detected in edentulous jaws. On the other hand, some investigators recommended the use of the radiographic examination when necessary, when there are symptoms or only when the needs call (3-12).

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A variety of radiographic techniques were recommended including intra-oral, extra-oral and panoramic surveys (7-11). However, no technique per se can completely satisfy all the requirements for an accurate shadow casting (13-15).

The aim of this study was to determine the real need for a radiographic examination for edentulous patients prior to denture construction.

**Material and Methods**

The panoramic radiographs obtained from inactive files of 212 patients -of both sexes- who required treatment with complete dentures were examined at the college of dentistry KSU. The radiographs were meticulously examined under standard conditions of radiographic interpretation of a dim room lighting, blockage of film periphery by black papers, using a viewer with even distribution of light and with variable light intensity and using a magnifying glass.

The mean age of the patients ranged between 39 & 72 years with an average of 55.5 years. None of the patients have been reported to possess pathological signs or symptoms or clinical evidence of pathosis as revealed by their clinical examination and reported in their files. They were only in need to be treated with complete dentures.

**Method of statistical analysis**

The chi-square test of goodness of fit for equal proportion was utilized to determine the difference of radiographic entities.

**Results**

Of the 212 panoramic radiographs examined, 180 were free of positive findings, and 32 (15.1%) have shown positive findings Table I and graph I. Eighteen patients (8.5%) had one or more remaining root fragments. Three patients (1.4%) had impacted teeth. The radiographs of 5 patients (2.4%) demonstrated radiopacities, and those of two patients (1.9%) demonstrated radiolucencies. The radiographs of four patients (1.9%) exhibited foreign bodies. Three cases were interpreted as amalgam particles in the soft tissue or residual ridge, one as a wire suture in a healed mandibular fracture.
Table I. Number and percent of radiographic entities

<table>
<thead>
<tr>
<th>Radiographic entity</th>
<th>Number of cases</th>
<th>% of patients</th>
<th>% of radiographic entities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Root fragments</td>
<td>18</td>
<td>8.5</td>
<td>56.3</td>
</tr>
<tr>
<td>Impacted teeth</td>
<td>3</td>
<td>1.4</td>
<td>3.1</td>
</tr>
<tr>
<td>Radiolucencies and mixed lesions</td>
<td>2</td>
<td>0.94</td>
<td>6.3</td>
</tr>
<tr>
<td>Radiopacities</td>
<td>5</td>
<td>2.4</td>
<td>15.6</td>
</tr>
<tr>
<td>Foreign bodies</td>
<td>4</td>
<td>1.9</td>
<td>12.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>32</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Graph I. The incidence of different radiographic entities.
Figure (1). Impacted teeth

Figure (2). Radiopacities

Figure (3). Radiolucent and mixed lesions

Figure (4). Retained roots

Figure (5). Foreign body
Statistical results
Application of the Chi-square test has shown that root fragments was a highly significant entity in comparison to the other entities.

Discussion

Most edentulous persons have lost their teeth due to various dental or periodontal conditions. Despite that the teeth are extracted and the ridges have healed in a satisfactory manner, hidden lesions or infections may not have been totally eradicated (7)

This study demonstrated and emphasized the need for a radiographic examination of the edentulous patients before constructing complete dentures for them. This is of great benefit because the normal appearance of the dental ridges may conceal problem underneath. This view is in acceptance with the views presented by other investigators (13-15).

The percentage of positive findings in this study and those of previous studies support the fact that some edentulous patients have potentially complicating conditions within the denture base foundation. These studies stress the necessity of radiographic examination of all edentulous patients prior to treatment with complete denture (7,9,10,11)

However, in this study the difference between patients without radiographic findings and those with radiographic findings was clearly observable and also was anticipated. This could be attributed to the progress in dentistry, increased use of radiographs before and after extraction, the advanced techniques in oral surgery as well as the increasing number of oral surgeons. This result is in accordance with that obtained by Axelsson, in 1988 (8) On the other hand, the high incidence of retained roots may be explained on the basis that those patients extracted their teeth in an educational college mostly by undergraduate students.

The plan of this study was to report a panoramic radiographic study of edentulous patients with emphasis on the incidence of five entities (root fragments, impacted teeth, radiolucencies, radiopacities, and foreign bodies) as was previously followed by John, 1985.
The percent of positive findings in this study and those of previous studies support the fact that some edentulous patients have a potentially complicating condition within the denture base foundation. These investigators stress the necessity of radiographic examination of all edentulous patients prior to treatment with complete denture. Furthermore, a radiographic survey of complete denture patients is recommended before denture therapy in as much as the expected frequency of clinically undetected pathologic conditions in edentulous jaws varies between 17% and 47%.

Periapical radiographs demonstrate good details but their coverage is limited. Moreover, considerable time is spent in exposing, processing and mounting at least 14 films. The procedure itself may elicit discomfort, pain or sometimes gagging to the patient. If a full mouth survey is compared to a panoramic radiograph as regards the total radiation dose the dose may be 10 times more.

From the results of this study it could be noted that routine panoramic routine radiographic examination of the jaws for all edentulous patients before constructing complete dentures. This view is justified by the advanced technology in panoramic radiography as the extremely low dose of radiation provided by the utilization of the rare earth screens, fast films and the use of digital radiography.

Conclusion

The results of this and previous studies demonstrate the necessity of routine radiographic examination of the jaws for all edentulous patients before constructing complete dentures. It also indicates the need for a better extraction technique together with the use of radiographs before and after extraction.

References


