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Research Article

**ANALYSIS OF VISIBILITY OF MANDIBULAR ANATOMIC  
LANDMARKS USING PANORAMIC RADIOGRAPHY**Dr Mariyam Usman<sup>1</sup>, Dr Maryam Hajira<sup>1</sup>, Dr Saher Rafique<sup>1</sup><sup>1</sup>Demontmorency College of Dentistry, Lahore**Abstract:**

**Introduction:** Pantamography is the frequently used radiographic technique in dentistry. The word panoramic radiography is extracted from panorama which means an unimpeded view of an area in every required direction. **Aims and objectives:** The main objective of the study is analysis of visibility of mandibular anatomic landmarks using panoramic radiography. **Material and methods:** This cross sectional study was conducted in Demontmorency College of Dentistry, Lahore during January 2019 to July 2019. The data was collected from 100 patients. Panoramic and CBCT images from 100 children and adolescent patients were randomly selected from existing records in the Department of Oral and Maxillofacial Radiology. **Results:** The data was collected from 100 patients. The mandibular canal could be observed in 92.5% of 100 cases, with good visibility in 12.0%. The mental foramen could be observed in 44.5% of cases, while no cases had good visibility. Anterior looping of the mental nerve was present in 16.5% of cases, but no cases had good visibility. An incisive canal could be identified in 22.5% of cases, with only 1.5% showing good visibility. The lingual foramen could be visualized in 61.0% of cases, with good visibility in only 6%. **Conclusion:** It is concluded that the radiation doses from CBCT are significantly lower than medical CT, but generally higher than conventional dental radiography.

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**INTRODUCTION:**

Pantomography is the frequently used radiographic technique in dentistry. The word panoramic radiography is extracted from panorama which means an unimpeded view of an area in every required direction. It is utilized to estimate the anatomical and structural relationship of mandibular canal, anterior loop of mental nerve, incisive canal, and mental foramen. It can be presumed that there may be large variations in the interforaminal region [1]. It is crucial to locate the mandibular canal and other associated anatomical key structures for implant surgery.

Today, panoramic radiography is often used for primary evaluations in dental practice to obtain information about the teeth, upper and lower jawbones, sinuses, temporomandibular joints, and other hard tissues of the head and neck [2]. However, panoramic radiographies only give two-dimensional information regarding the superimposition of all structures and lack information in a bucco-lingual direction. Contemporary imaging techniques such as cone beam-computed tomography (CBCT) may be particularly suitable in the evaluation of jaws, as three-dimensional visualization and the high-resolution analysis of the entire mandible provide adequate information to localize anatomical structures [3].

Radiography is a non-invasive method for diagnosis and treatment planning before surgical operations in the mandible. The panoramic radiography technique is a curved plane tomographic radiographic modality, in which the mandibular canal seems to be a radiolucent line limited by two outer radiopaque lines [4]. The mandibular canal starts at the mandibular foramen and reaches the mental foramen. Panoramic radiographs are usually magnified and have anatomical structure superimposition. However, panoramic radiography has some advantages, such as being cost effective and easily accessible and requiring a minimum amount of time to obtain a radiograph. Therefore, panoramic radiography is widely used for

diagnosing, imaging, and deciding the best surgical treatment options [5].

**Aims and objectives**

The main objective of the study is analysis of visibility of mandibular anatomic landmarks using panoramic radiography.

**MATERIAL AND METHODS:**

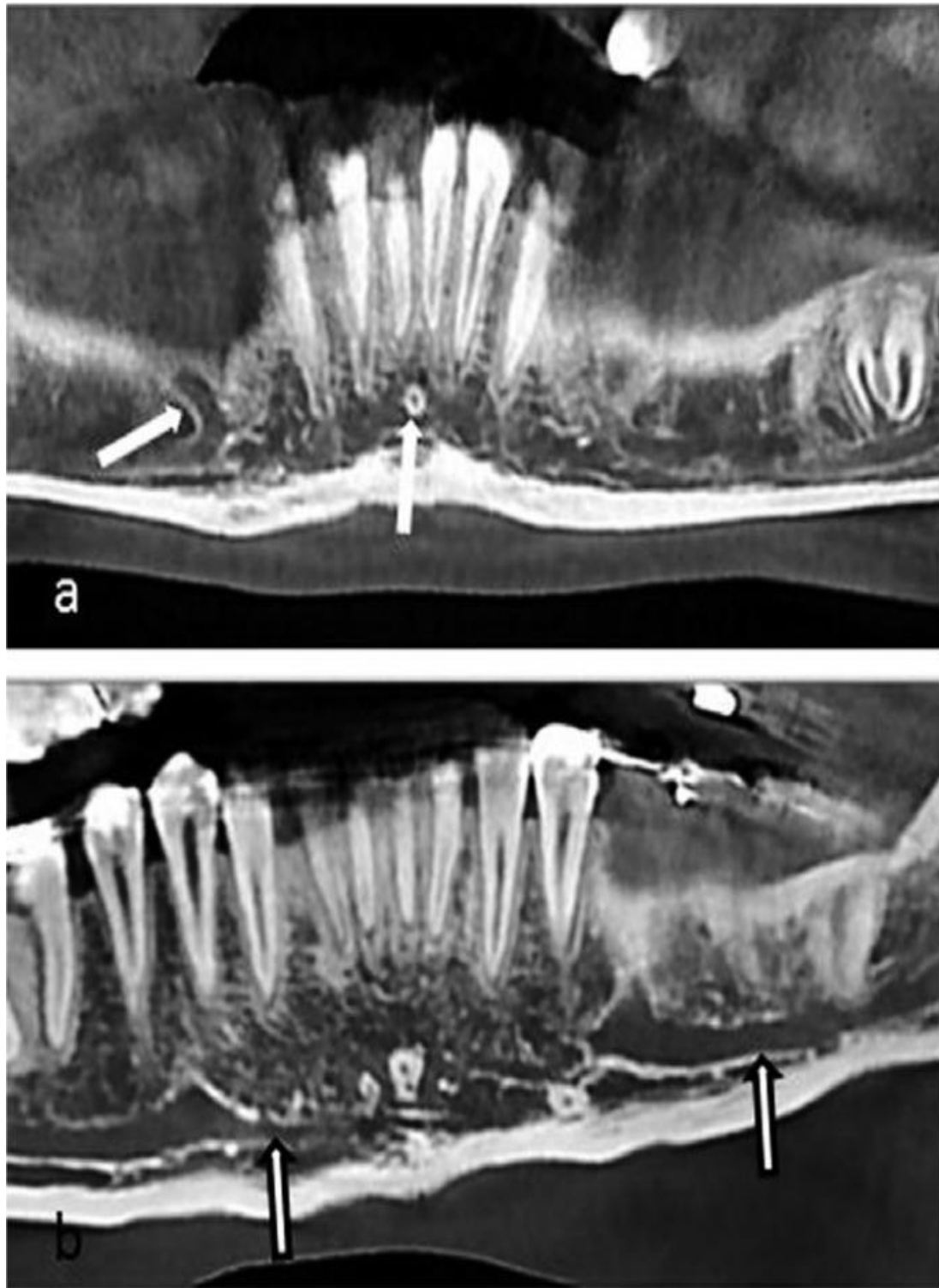
This cross sectional study was conducted in Demontmorency College of Dentistry, Lahore during January 2019 to July 2019. The data was collected from 100 patients. Panoramic and CBCT images from 100 children and adolescent patients were randomly selected from existing records in the Department of Oral and Maxillofacial Radiology. All of the patients had been referred for CBCT diagnosis and treatment planning, consisting of 23 impacted teeth patients, 47 orthodontic patients, 19 possible pathosis patients, five supernumerary teeth patients, and six TMJ disorder patients. All radiographs were performed by x-ray technicians who had a minimum of five years of work experience.

**Statistical analysis**

All calculations were processed using the Statistical Package for Social Science statistical software (version 16; SPSS Inc., Chicago, Illinois). Descriptive statistics including tables were used to display information. A chi-square test was used to compare the CBCT and panoramic images.

**RESULTS:**

The data was collected from 100 patients. The mandibular canal could be observed in 92.5% of 100 cases, with good visibility in 12.0%. The mental foramen could be observed in 44.5% of cases, while no cases had good visibility. Anterior looping of the mental nerve was present in 16.5% of cases, but no cases had good visibility. An incisive canal could be identified in 22.5% of cases, with only 1.5% showing good visibility. The lingual foramen could be visualized in 61.0% of cases, with good visibility in only 6%.



**Figure 01:** Cone beam computed tomographic panoramic view of a 17-year-old boy with denoted structures; anterior looping of the mental nerve (right side) and lingual foramen (a), and incisive canal (right side) and mandibular canal (left side) of a 16-year old a girl (b).

**DISCUSSION:**

Several factors contribute to the reliability of landmark identification in children: the density and sharpness of images, the anatomic complexity and superimposition of hard and soft tissues, the definition of the landmark, and the training level or experience of the observers, especially for pediatric dentistry [5,6]. The mandibular canal could be observed on panoramic and CT scans in 92.5% and 100% of cases, with good visibility in 12.0% and 50% of them, respectively. These findings are less promising than those from a previous study on panoramic images, where a canal was visible in 99% of cases and good visibility in 49%; however, in accordance with prior studies on CT scans, a canal was visible in 97% and 99% of cases in present study [7].

Olivier was the first to describe the course of the incisive nerve as a continuation of the inferior alveolar nerve traveling through a canal. Mardinger et al. and Mwaiva et al. anatomically observed an incisive canal in 80% and 96% of mandibles, respectively. Other studies, however, have neglected to identify the presence of a true incisive canal [8]. The present anatomical study did not fully confirm the existence of the incisive canal, as it could only be seen in 49.5% (CT scan) and 22.5% (panoramic images) of the mandibles [9]. The relatively low occurrence rate of the incisive canal in anatomical studies makes this observation most likely an anatomical variation [10].

**CONCLUSION:**

It is concluded that the radiation doses from CBCT are significantly lower than medical CT, but generally higher than conventional dental radiography.

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