

Possible Identification Marker in Orthopantomograms: Edentulous

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Abstract: The routine radiographic examination by orthopantomography of the jaws of all dental patients is necessary and justifiable. To evaluate the possible radiographical marker in edentulous for identification. To determine the age and gender from different parameters of radiographs. Study was conducted on 103 orthopantomograms of edentulous patients, aged (55-76 years). All radiolucencies or radiopacities in premolar to posterior alveolar ridge were observed. Different parameters such as; height of mandibular body, distance between lower mandible border to superior margin of mental foramina. The distance between the superior margin of mental foramina to crest of the alveolar ridge and the from the lower border to crest of alveolar ridge. Identification markers were found in 23.8 percent cases. Age was directly related to alveolar ridge in both males and females. Distance between crest of alveolar ridge and superior margin of mental foramina may be used for gender and sex determination.

Key words: Edentulous • age • sex • orthopantomogram

INTRODUCTION

Identification and determination of unknown human skeletal remains has been one of the most challenging tasks for forensic dentistry. The routine radiographic examination by orthopantomography of the mandible of the dental patients is necessary and justifiable for treatment [1, 2]. Amalgam rests can be marker as particularly unique features which have been reported to have contribution to identifications [3]. The identification by means of the state of resorption of the alveolar ridge is different and depends, along with many other anthropological measurements. The rate of resorption depend from time since extraction, osteoporosis, diet, use of dentures, periodontal disease and other parafunction. In this study, a sample of orthopantomograms was surveyed to establish the frequency of radiological characteristics and the trend of ridge resorption which could be used in forensic dentistry for identification.

MATERIALS AND METHODS

The study was conducted on 103 (M:F, 51:52) digital orthopantomograms of edentulous patients aged (55-76 years) from the Govt. Dental College, PGIMS Rohtak. A visual light box and magnifying lens were used to examine the radiographic films and measurements were carried out

with a set square aligned with the lower border of the mandible and at right angle to it.

Selection and exclusion criteria: Good quality orthopantomograms (OPG) with complete lower border of mandible were selected while incomplete lower border of mandible and no observation of mental foramen were excluded from study.

The following measurements were taken in all OPG:

- Height of mandibular body (both sides).
- Distance between lower mandible border to superior margin of mental foramina (both sides).
- The distance between the superior margin of mental foramina to crest of the alveolar ridge.
- The distance from the lower border to the crest of alveolar ridge.

All radiolucencies or radiopacities in premolar to posterior alveolar ridge were observed. All analysis were performed using SPSS (version 7.0).

RESULTS AND DISCUSSION

Amalgam rests has been particularly useful marker of identification in edentulous jaw radiographically [3]. The amalgam rests marker more in male as compared to

Table 1: The relationship between gender types of marker and distribution (in %age) in premolar area to posterior alveolar ridge in OPG

Sr. No.	Identification marker	Sex	Distribution
1	Amalgam rests	M	4.6%
		F	4.1%
2	Retained roots	M	0.8%
		F	0.4%
3	Impacted teeth	M	0.9%
		F	0.7%
4	Retained/impacted tooth fragments	M	0.6%
		F	0.2%
5	Radiolucencies	M	2.3%
		F	3.0%
6	Radiopacities	M	3.1%
		F	3.1%

Table 2: (Mean + SD in mm) different parameters of three groups OPG's in gender

Parameters	Gender	Group I	Group II	Group III	Group IV
		55-60 years	60.1-65 years	65.1-70 years	70.1-76 years
Height of body of mandible	M	6.2±1.3	6.1±1.7	6.1±1.8	6.1±1.2
	F	5.3±1.2	5.3±1.2	5.2±1.9	5.2±1.4
Distance between lower border mandible to superior margin of mental foramina	M	2.4±1.8	2.3±1.3	2.3±1.5	2.3±1.5
	F	2.3±1.5	2.3±1.4	2.2±1.3	2.2±1.7
Distance between the superior foramina to crest of alveolar ridge	M	1.9±1.3 ^a	1.5±1.2 ^a	1.4±1.2 ^a	1.2±1.6 ^a
	F	1.6±1.2 [*]	1.3±1.2 [*]	1.1±1.1 [*]	0.7±1.2 [*]
Distance from lower border to crest of alveolar ridge	M	4.5±1.3	3.8±1.3	3.7±1.3	3.1±1.3
	F	3.5±1.2	3.4±1.7	3.3±1.2	2.9±1.2

^ap<0.01 and ^{*}p<0.01, a as compared to * is p<0.01

female (Table 1). It is due to chipping during the extraction. It is also found in posterior reason due to predominance of amalgam restoration.

Radiolucent and radiopaque areas accounted for 11.5% of observed features in as posterior region due to pathology, caries, periodontal disease and its treatment. Radiolucent areas more common in female as compared to male while radiopaque area are equal in both gender. Impacted tooth (1.2%) and retained roots (1.2%) more common than retained impacted tooth fragments (0.8%).

Hence amalgam rests, radiolucencies, radiopacities, retained roots, impacted teeth and retained or impacted tooth fragments act as radiographical marker in edentulous for identification. These markers included in edentulous jaws are very important when identifying persons or bodies where an archival radiograph exists to compare with a current one of the person or body and where it will often be quite obvious that they are from the same jaws or not. The distance between superior margin of mental foramina to crest of alveolar ridge (SM to AR) is decrease significant with age (p<0.01; Table 2); SM to AR resorption rapidly in female as compared to male. This

may be self evident given, the susceptibility in females to conditions such as osteoporosis. It is also observed that bone below the mental foramen could be said to constitute basal bone and to be less susceptible to resorption.

So the distance between the superior margin of mental foramina to crest of alveolar ridge may be used for age and gender determination. Further study will be required on large sample so that proper regression equations and base line will be provide for identification in forensic dentistry.

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