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CASE REPORT

Forensic Analysis of a Mandible- A Case Report on Bilateral Mandibular Permanent Central Incisor Hypodontia

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ABSTRACT

"Forensic eye is deep and penetrating"- so goes the saying. To look closely to reveal the hidden and untold facts should be the prime notion of a forensic expert. Skeletal remains examination is such an informative aspect. As age and sex are the most important primary data for identification, the field of forensic anthropology is not an exception. It gives many information and inference in anthropological ageing, sexing and other forensic investigations. A mandible, kept for years in the department as a teaching material without any history, revealed such a few interesting facts and explanations. There was an unexplained, mysterious gap in the midline between two lateral incisors and later on this "missing link" was established as a result of congenital absence of bilateral mandibular permanent central incisor teeth. Vivid and minute examination along with thorough research ultimately revealed the whole informations.

Key Words: Forensic Anthropology, Mandibular Teeth, Congenital Absence, Central Incisor

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INTRODUCTION

Human body is composed of different tissues, starting from the very soft mucus membranes to stony hard bones. These together give shape to human body. Human skeleton is an excellent material for the anthropological, genetic, medical, dental and other research purpose. In forensic identification, age and sex are taken as primary data. As per Krogman, pelvis (95%) followed by skull (90%) is the most informative bone in anthropological sexing.[1] Notably, mandible is the strongest bone of the skull which shows very prominent sexual dimorphism and age related changes.[2] Even it can be used as a weapon as it forms the lower jaw and holds the teeth. So study of various attributes of mandible has been researchers delight for years. In this present paper a number of interesting informations and peculiarities of mandible examination will be discussed which is often mistaken or overlooked by the learners.

CASE HISTORY

In the Department of Forensic Medicine and Toxicology, Sikkim Manipal Institute of Medical Sciences, we came across a sample of mandible bone which was kept in the department since a long time as teaching material. The history or the background informations including the source of this sample was not known or available.

Examination Findings (Figure 1, 2, 3, 4):

The characteristics of the mandible were as follows:

1. It was of larger size and massive mandible with prominent anatomical landmarks.

2. The chin was square shaped.
3. Symphysis mentis was prominent.
4. Condyles were large, the level of which was above the coronoid process in anatomical position.
5. The mental foramina were at the middle of the body in between the alveolar process and the lower border of the body.
6. The anatomical/ gonial angle (useful for determining sex) was everted.
7. The medico-legal angle i.e. angle between the superior border of body and ramus was slightly obtuse.
8. Prominent mental protuberance and mental tubercle along with sharp mental spine.
9. Total number of the teeth with sockets was fourteen (14) in number, seven (7) on each side of midline.

Figure 1 Everted anatomical angle

Figure 2 Condyles higher than coronoid process

Figure 3 Mental foramen and attrition of right first molar teeth

Figure 4 Gap between two lower lateral incisors and inclination of the lateral incisors toward midline

Careful examination revealed a gap in the midline exactly in the place of lower central incisors. It indicates there was falling of the both deciduous central incisor teeth earlier than the other teeth, which are evident from the remaining sockets. There is no evidence of bony injury or loss of bony tissue at the margin of the socket or evidence of adherent blood. So it can be opined that the falling of both central incisors is not consistent with that of a traumatic variety. The resolution of the sockets of both these lower central incisors indicates their far earlier than fall of the other neighboring teeth as evident from the sockets, which can be few months to years according to the particular subject profile depending upon the genetic, nutritional, and constitutional and other factors. The count of teeth is seven on each side. But it is misleading to ascertain the age of the subject. According to the number of teeth present (fourteen in total) the common inference will be non-eruption of the both sided permanent third molar teeth though there are three permanent molars on each side present. It proves the necessity of identifying and giving due importance to the characteristics of the each and individual tooth.

The degree of attrition of the mandibular teeth was also notable. It is. It is having a second degree (A++) of attrition, which is evident in the 1st molars present. Considering only this data of Gustafson's method, the age of the person is very likely to be above 35 years (about 35 to 45 years).

The possibility of congenital and permanent absence of any tooth must not be forgotten which is often found in lower lateral incisors commoner than central ones.

So, before opining about the age, following findings should be taken care of:

1. Total number of teeth including the sockets.
2. Character of each tooth with individual morphology for identification of the particular tooth.
3. Degree of ageing changes of the tooth. (Gustafson's criteria)
4. Absence of incisor teeth, which is commoner in case of, laterals ones than the central variety.

DISCUSSION

General characteristics, discussed above, prove that it belongs to a male person. The central gap draws the attention about the fact that after falling of deciduous lower central incisor, there was no eruption of permanent central incisor teeth in the respective mandible. It is very uncommon and practically rare incident. Usually as lateral incisors erupt after central incisors, the direction of the longitudinal axis of the sockets of lateral incisor is found to be inclined towards the centre with the tendency to minimize the gap created by non-eruption of both the permanent central incisor teeth. Possibility of non-eruption of deciduous central incisor is practically nullified by the evidence of resolution of the socket margins upto the surface of the bone.

The odontologists in living report most of the dental peculiarities, but it has enormous forensic implications. The extent of these anomalies poses many problems as facial appearance, malocclusion, and mastication difficulty or speech problems. These help in identifying a person too. Oligodontia is congenital absence of six or more teeth excluding molars and hypodontia refers to congenital absence of less than six teeth excluding molars.[3] So, the present rarity is a case of bilateral mandibular permanent central incisor hypodontia. Prevalence of hypodontia in deciduous teeth is about 0.1-0.9%, whereas it is 2-10% in permanent variety. Females have shown higher prevalence than males. The first report on congenitally missing bilateral mandibular

incisors was given by Newman in 1967.[4] Unilateral or bilateral maxillary lateral incisors are absent congenitally most commonly, followed by maxillary second premolar and mandibular central incisors.[5] But agenesis of bilateral mandibular permanent central incisors is not well documented.

The author in his thesis work on stated that congenital absence of third molar though not uncommon, lateral incisors, premolars, rarely canine and even central incisors may show agenesis alone or in combination with others.[6] In 1998, Newman & Newman proposed the following theories to explain causes of such agenesis: Firstly, familial or hereditary distribution, Secondly, during formation of mandibular symphysis tooth buds can be disturbed, Thirdly, failure of attempt to locate itself in the short dental arch leading to reduction of dentition, Fourthly and finally, localized infections or inflammations of jaw leading to disturbed dental tissue buds.[7]

Congenital absence of multiple primary teeth as many as fourteen has also been reported.[8] Pirinen Sinikka *et.al.* proposed the possibility of autosomal recessive trait in lower incisor hypodontia.[9]

It can be conclusively stated that congenital absence of mandibular bilateral permanent central incisors is a rare incidence and one should be aware of that during opining such cases.

CONCLUSION

It can be conclusively stated that congenital absence of mandibular bilateral permanent central incisors is a rare incidence and one should be aware of that during opining such cases.

Conflict of Interest: None

Ethical clearance: Not required

Declaration: The manuscript is an original research work and not been submitted anywhere for publication.

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