

Original Article



The Frequency of The Carabelli Trait in Selected Bangladeshi Population

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Abstract

Background: The Carabelli cusps are a tubercle or a additional cusp or a ridge on the palatal surface of the mesio-palatal cusps of maxillary first molars and maxillary second deciduous molars. **Objectives:** The aim of this study was to determine the frequency of cusps of carabelli in permanent first maxillary molars in selected Bangladeshi population. **Materials and Methods:** This observational study was carried out at MH Samorita Medical College and Dental unit from January 2017 to May 2018 with 104 subjects in young adult individuals. **Results:** Out of 104 individual the tubercle was present in 55 with a percentage of 52.88%. Among this the total number of male with tubercle 27(49.09%) and female was 28(50.51%). **Conclusion:** The Carabellis tubercle is mainly used for differentiation between different populations. Frequency of occurrence of Carabelli trait is moderate among Bangladeshi people.

Keywords: Carabellis tubercle, Maxillary First molar, Anthropology, Groove.

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Introduction

Cusp of Carabelli is a tubercle or an extra cusp present on the lingual side of the mesio-lingual cusps about half-way between its apex and the cervical margin of the maxillary first permanent molar tooth. It may also found maxillary second and third permanent molars and maxillary second deciduous molar teeth. It is also known as tubercle of Carabelli, Carabelli tubercle, trait of Carabelli, fifth cusp, and molar tubercle accessory cusp tuberculum anomaly of George Carabelli. The cusp of Carabelli was first described by an Austrian dentist named George Von Carabelli in 1842.¹ It is a dental morphologic trait nonfunctioning mini cusp or tubercle or groove or furrow that present symmetrically on the mesio-palatal surface of maxillary first permanent molar crown.^{2,3} The cusps of Carabelli is a heritable feature. It is entirely absent in some individuals and present others either unilaterally or bilaterally. However it generally appears bilaterally.⁴ The Carrabelli's tubercle can be useful in establishing phylogenic relationships between closely related population.⁵ It has no established etiology, nor known

function. Although it is said this clinically important, it has some importance in dental industries, forensic odontology, and anthropology. The orthodontic molar bands have no compensation for this cusp. As a result, the space between the band and the tooth is filled with food debris, and it results in early caries. This needs to be kept in mind during pit and fissure sealing. Even the molar extraction forceps have no accommodation for this cusp and may therefore result in fracture of the molar teeth.³ Hence the aim of the present study was to find the frequency of cusp of carabelli in Bangladeshi population.

Materials and Methods

The data were collected from oral examination from MH Samorita Medical College and Dental Unit. The study was performed among a total of 104 with young adult individuals. The prevalence of Carabelli traits was based on plaster casts of the permanent dentition of 104 subjects. All examinations were done in sufficient lighting conditions. Examination gloves, mouth mask, sterile wooden spatula and a torch light

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were used for examination. Smooth palatal aspect of mesiopalatal cusp of the above mentioned molars, was recorded as 'trait absent'. The presence of a groove or elevation in the form of a tubercle or cusp was recorded as 'trait present' the cusp of Carrabelli's checked and analysed on the upper first molar tooth and if found is noted for its shape and size and then photographed for further analysis. Casts of subjects having maxillary first permanent molars without gross morphologic damage by caries, attrition, or any other trauma were included in the study. Exclusion criteria from the investigation were 1) poor quality of the study casts, 2) chipped or broken teeth 3) attrition 4) gross caries and 5) restorations.

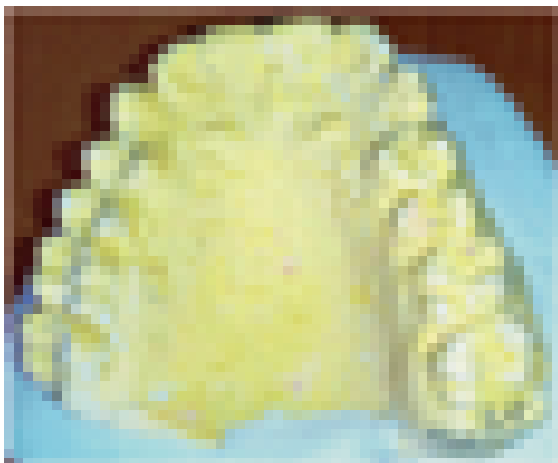


Fig 1: Cusp of Carabelli

Results

In this study, a total of 104 casts were examined for the presence or absence of cusp of Carabelli. Out of these 55 patients showed that presence of cusp of Carabelli contributing 52.88% (figure 2). Among this, the total number of male with tubercle was 27 (49.09%) and female was 28 (50.91%). Out of the 55 records showing presence of the 40 cases had bilateral presence with presence of the cusp on both right and left maxillary first molars. Unilateralism was seen in only 15 of the cases. Male unilateralism and bilateralism was seen in 08 and 19 cases respectively. In female sample, 07 subjects demonstrated unilateral presence while in 21 of the cases bilateral presence of the Carabelli cusps was seen (table I).

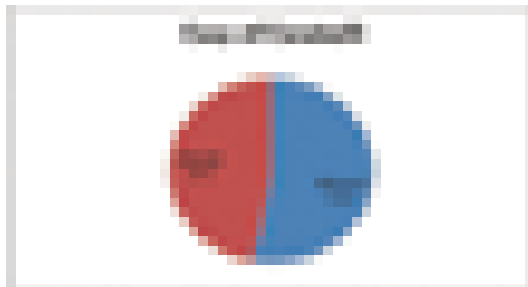


Figure 2: Incidence of Carabelli's tubercle

Table I: Distribution of Carabelli's tubercle in male & female individuals

Sex	Site	N	%
Male	Unilateral	8	7.69
	Bilateral	19	18.27
Female	Unilateral	7	6.73
	Bilateral	21	20.19
Total		55	(100)%

Discussion

Tooth morphology has a great importance in Clinical Dentistry, Forensic odontology and Anthropology. Cusp of Carabelli has an important for the determination of ethnicity and for Forensic dentistry too. It has also got attention in many science fields like Anthropology, Genetics and Evolution, as regards as biological dominant in population.⁴ In this study, cusp of Carabelli was found in 52.88% cases, and more in female (50.91%) than that of male (49.09%) and as shown in figure 2 & table I. So it can be said that in Bangladeshi population Carabelli traits found as a moderate prevalence. There was no statistically significant variation found in male and female population.

Frequency of Carabelli trait varies among different races for example a higher frequency was seen in North West European origin Americans 83.5%.⁶ Aboriginal Australians 80%,⁷ Finish population 79%,⁸ South Africans 79.2%,⁹ Nepalese-68.3%.¹⁰ A moderate prevalence was seen in Saudi Arabians 58.7%,¹¹ and 57.6%;⁵ Indians 52.7%¹² Brazilians 51.6%;¹³ Malaysians 52.2,⁷ Russian 50%,¹⁴ and Mixed Europeans 50%.⁷ Low prevalence was seen in Eastern Greenland Eskimos 0%, Japanese 10.7%,⁷ Nigerians 17.43%, and Modern Chinese 21%.¹⁵ In this study there was no caries incidence related to Carabelli trait. A study from Nigeria also showed that caries incidence related to Carabelli structure was insignificant.¹

Conclusion

Carabelli cusp is mainly used for differentiation between different populations. The expression of carabelli trait in the selected Bangladeshi population is moderate although frank cusp was rarely noticed. The bilateral presence of the trait was common. The study of the presence and degree of expression of the trait is implied in the determination of ethnic origin of the individuals.

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