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Analysis of characteristics of Mesiodens in Jodhpur population with associated complications and its Management- Clinico- radiographic study

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Abstract

Aim and Objectives- The study was done to observe the prevalence of mesiodens and its associated complications and its management in Jodhpur population. It was based on both clinical & radiological evaluation. Prevalence of mesiodens was observed considering gender, shape, number, eruption status, orientation, & complications associated with them.

Material and Methods- A total of 6400 patients who visited OPD of private dental college of Jodhpur city (Rajasthan) for a period from April 2013 to March 2014 were included in the study for the prevalence of mesiodens. All the patients were thoroughly examined clinically. Radiographic examinations were carried out for all the patients with mesiodens. Photographs of all the cases were taken with their respective radiographs. Exclusion Criteria included Patients with cleft lip & palate, Patients with systemic diseases & syndromes and Patients below 14 yrs.

Results- 46 mesiodens were found in 36 patients, with prevalence of 0.6%. Out of them 31 were males & 5 were females, with ratio of 6.2:1. Of 46 mesiodens, 37 were erupted & 9 were impacted. Conical was the most common shape found, followed by molariform & tuberculate. 85.9% of mesiodens were vertically oriented, 4.6% of mesiodens were horizontal while 8.7% of mesiodens were inverted in orientation. Out of 36 patients, 28 were asymptomatic, 4 were associated with pathology while 4 required esthetic correction.

Conclusion- Mesiodens when present may be associated with some complications. Careful observation, proper diagnosis & systematic treatment may prevent the patients to face the problems. Further studies with larger sample size with more parameters should be carried out in different populations so as to obtain a national data base for future researchers.

Keywords: Mesiodens, supernumerary teeth, developmental dental anomalies.

1. Introduction

The teeth causing the numerical excess in the normal dentition is described as supernumerary teeth. Mesiodens refers to a supernumerary tooth/teeth present in the premaxilla placed palatally, labially or in between the two central incisors [1]. The term Mesiodens was coined by Bolk in 1917 to denote the supernumerary tooth present in between the maxillary central incisors [2, 3]. Mesiodens are the most common type of supernumerary teeth with overall prevalence between 0.15% and 1.9% [4]. Their incidence has been reported between 46 & 67% of all the supernumerary teeth. They occur more commonly in the permanent dentition as compared to that of primary dentition with male predominance (2:1). They are usually small, with a cone shaped crown and a short root. Mesiodens can occur individually or as multiples, may appear unilaterally or bilaterally, usually found to be impacted and even inverted sometimes.

Mesiodens may be rudimentary or Supplementary [5]. Supplementary mesiodentes resemble natural teeth in both size and shape, whereas rudimentary mesiodens exhibit abnormal shape and smaller size. Mesiodens may be conical, tuberculate or molariform in shape though conical is the most common form. Conical mesiodentes often have a completely formed root and can erupt into the oral cavity. Tuberculate mesiodens are barrel-shaped, with several tubercles or cusps, and have incomplete or abnormal root formation [6, 7]. In contrast to

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conical mesiodens, tuberculate mesiodentes rarely erupt themselves. Tuberculate mesiodents are commonly associated with other supernumerary teeth, develop later than conical mesiodentes and usually occupy a more palatal position. Molariform mesiodens has a premolar-like crown and a completely formed root.

Most problems associated with mesiodens are related to altered growth and development in the area. Common problems include abnormal crowding or spacing of the anterior teeth, over-retention of primary teeth, impaction or delayed eruption of permanent teeth, dilaceration or abnormal root development. Other less frequent problems are root resorption of adjacent teeth, cyst formation, and nasal eruption of inverted supernumerary teeth.

2. Materials & Methods

A total of 6400 patients who visited OPD of private dental college of Jodhpur city (Rajasthan) for a period from April 2013 to March 21014 were included in the study for the prevalence of mesiodens. The study was approved by institutional ethical committee. Written confirm consent was taken from all the patients. All the patients were thoroughly examined clinically under artificial illumination using mouth mirror & probe wearing sterile hand gloves & mouth mask & radiographs were taken if mesiodens were found. All the mesiodens found were observed considering gender, shape, number, eruption status, orientation & complications associated with them. Radiographic examinations were carried out for all the patients with mesiodens. Photographs of all the cases were taken with their respective radiographs.

Exclusion Criteria included Patients with cleft lip & palate, Patients with systemic diseases & syndromes and Patients below 14 yrs.

3. Results

A total of 36 patients were diagnosed as having 46 mesiodens from 6400 patients. The prevalence rate was 0.6%. Out of 36 patients 31 were males and 5 were females with ratio of 6.2:1, [Table 1]. The number of mesiodens per patient was 1.28. Among the 46 mesiodens, conical shape was the most common type, accounting for 67.4% of the total sample [Table 2]. The other two types were molariform and tuberculate (Fig1).

Of the 46 mesiodens, 85.9% were in a vertical position, 8.69% in an inverted position and 4.34% in a horizontal position [Table 3]. 80.4% (37 mesiodens) were erupted and the remaining 19.56% (9) were impacted [Table 4].

32 patients were found with single mesiodens and 7 patients with two mesiodens. None of the subjects had three or more

mesiodens [Table 5, Fig 2]

Poor esthetics & irregular arrangements were the complaints of some patients. Some impacted mesiodens were also associated with pathological radiolucencies (Fig 3). After proper clinical history and required investigations patients were provided needful treatment which involved Extraction & endodontic approach followed by prosthesis [Table 6, Fig 4].

Table 1: Distribution of mesiodens by gender.

	No. of Patients	Percentage
Males	31	86.2
Females	5	13.8
Total	36	100

Table 2: Distributions of mesiodens by shape

Shapes of mesiodens	No. of mesiodens	Percentage
Conical	31	67.4
Molariform	11	23.9
Tuberculate	4	8.67
Total	46	100

Table 3: Distribution of mesiodens by Orientation

Orientation	No. of mesiodens	Percentage
Vertical	40	85.9
Horizontal	2	4.6
Inverted	4	8.7
Total	46	100

Table 4: Distribution of mesiodens by Eruption status

	No. of mesiodens	Percentage
Erupted	37	80.4
Impacted	9	19.56
Total	46	100

Table 5: Distribution of mesiodens by number.

	No. of Mesiodens	Percentage
Single mesiodens	32	69.5
Double mesiodens	7	22.9
Total	46	100

Table 6: Complications associated with mesiodens.

Pathology	No. of patients	Percentage
Esthetic correction	4	11.1
Asymptomatic	28	77.7
Total	36	100



Fig 1: A, B, C showing Conical, Molariform and Tuberculate shape respectively



Fig 2: A showing single conical & molariform mesiodens, B showing double conical mesiodens



Fig 3: A showing Impacted mesiodens without pathology, B showing 2 Impacted mesiodens with cyst like radiolucency



Fig 4: Showing Post surgical extraction images.

4. Discussion

Mesiodens are the most common supernumerary teeth with overall prevalence between 0.15%- 1.9%. Prevalence in our study was found to be 0.6% which is coinciding with the prevalence in literature. They occur individually or multiple in number, in our study, 7 patients had double mesiodens. In 2 patients both were clinically visible, in 3 patients both were impacted while in 2 patients 1 was impacted & the other was clinically visible. Thus, total 14 mesiodens were present in 7 patients.

Of 46 mesiodens, 80.8% of mesiodens were erupted while 19.56% were impacted which is contrasting with the studies of Kaan *et al.* & Mevlut *et al.* [8, 9]. Out of 36 patients with mesiodens, 31 were males & 5 were females, which was coinciding with the prevalence in literature.

Out of 46 mesiodens, 40 were vertically oriented, 2 were horizontally & 4 were inverted in orientation. Conical shape was found to be the most common observed morphology in the present study, followed by molariform & tuberculated.

The etiology of supernumerary teeth is not completely understood. Various theories exist for the different types of supernumerary. Phylogenetic reversion (atavism) theory postulated that mesiodentes represented a phylogenetic relic of extinct ancestors who had 3 central incisors. This has now been largely discarded by embryologists. A second theory known as dichotomy suggests that the tooth bud is split to create 2 teeth, one of which is the mesiodens. Supporters of this theory believe that dichotomy represents complete germination, which also occurs frequently in the anterior maxilla. The third theory, involving hyperactivity of the dental lamina, is the most widely supported. According to this theory, remnants of the dental lamina or palatal offshoots of active dental lamina are induced to develop into an extra tooth bud, which results in a supernumerary tooth [4]. Heredity may also play a role in the occurrence of this anomaly.

Mesiodens may be associated with pathologies like cyst, malocclusion. In our study, 2 impacted mesiodens in 2 patients were associated with cyst like radiolucencies & were treated

accordingly, 28 patients were asymptomatic while 4 patients were associated with esthetic problems.

5. Conclusion

Mesiodens when present may be associated with some complications. Careful observation, proper diagnosis & systematic treatment may prevent the patients to face the problems. Further studies with larger sample size with more parameters should be carried out in different populations so as to obtain a national data base for future researchers.

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