

# A Rare Case of Twinning Involving Primary Maxillary Lateral Incisor with Review of Literature

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## ABSTRACT

Twinning is referred to the development of two separate teeth that arose from the complete separation of one tooth bud. To the best of our knowledge very few cases of twinning in primary or permanent dentition have been previously reported. Here, we report an additional case of twinning involving primary maxillary left lateral incisor and a literature review of clinical and radiographic findings of previous reported cases of gemination and twinning is also discussed. A six-year-old male patient reported to the dental clinic with the complaint of decay in the left front teeth region of the upper jaw. On clinical examination, dentinal caries was observed on the labial surface of primary maxillary left lateral incisor. The tooth showed a deep groove present in relation to the labial surface and incisal edge and continued cervically as a shallow groove. The patient had normal compliment of teeth for his age. The intra-oral periapical radiograph of the maxillary anterior region revealed large crown and a radiolucent notch was observed in relation to the incisal edge of the maxillary left primary lateral incisor. Relatively one pulp chamber and two root canals were observed in relation to the primary maxillary left lateral incisor, which was suggestive of a case of twinning involving primary maxillary left lateral incisor. This present case is the first case report of twinning seen in primary dentition.

**Keywords:** Anomaly, Double tooth, Gemination, Root canals, Twinning

## CASE REPORT

A six-year-old male patient reported to the dental clinic with the complaint of decay in the left front teeth region of the upper jaw. On clinical examination, dentinal caries was observed on the labial surface of primary maxillary left lateral incisor. The tooth was larger in the mesiodistal dimension and there was a deep groove present in relation to the labial surface and incisal edge and continued cervically as a shallow groove. The patient had normal compliment of teeth for his age [Table/Fig-1,2].

Periapical radiograph of the maxillary anterior region showed a large crown and a radiolucent notch in relation to the incisal edge of the primary maxillary left lateral incisor. Relatively one pulp chamber and two root canals were observed in relation to the primary maxillary left lateral incisor, which was suggestive of a case of twinning involving primary maxillary left lateral incisor [Table/Fig-3]. Since the patient was not concerned about the aesthetic problems, only the caries present in the labial groove was removed and filled with GC 2 restoration (Glass Ionomer Cement).

## DISCUSSION

Developmental dental disorders may range from abnormalities in the demarcation of the dental lamina and anomalies of tooth germs (number, size and shape) to abnormalities in the growth of the dental

hard tissues (structure). Dental anomalies are not only congenital but they may also be idiopathic, inherited or acquired [1].

The terms "double tooth", "fused teeth", "connoted teeth", "conjoined teeth", "double formations" are commonly used to exemplify gemination and fusion. These anomalies together are primary developmental disorders of the teeth. Double teeth are two separate teeth exhibiting merger by dentin and perhaps their pulps. The unification may be the result of fusion of two adjacent tooth buds or the unfinished splitting of one into two [2,3].

Formerly, gemination was defined as an attempt of a single tooth bud to split, with the ensuing development of a tooth with a bifid crown and typically a general root and root canal. On the other hand, fusion was considered as the union of two normally separated tooth buds with the consequential development of a joined tooth with confluence of dentin. Finally, Concrescence was the union of two teeth by cementum without confluence of the dentin. All the definitions were confusing and open to debate. Few authors have recommended that the conditions such as gemination, fusion and concrescence should be discontinued and a general term twinning to be used [1].

Twinning is considered when there is development of two separate teeth that arose from the complete division of one tooth bud [4].



**[Table/Fig-1]:** Clinical photograph showing primary maxillary left lateral incisor which is larger in mesiodistal dimension and the patient has a normal compliment of teeth for his age. **[Table/Fig-2]:** Clinical photograph of primary maxillary left lateral incisor showing a deep groove present in relation to the labial surface and incisal edge. The groove continued cervically as a shallow groove and dentinal caries was observed on the labial surface. **[Table/Fig-3]:** Intra-oral periapical radiograph of 51, 61, 62 and 63 revealed relatively one pulp chamber and two root canals seen in relation to the primary maxillary left lateral incisor.

Author	Year	Age/ Sex	Tooth involved	Radiographic Examination
Spuller RL et al., [9]	1986	7yr/F	Permanent maxillary right central incisor	Single root canal and pulp chamber
Krishnan S et al., [4]	1999	35yr/M	Permanent maxillary right lateral incisor	Presence of two separate root canals *
Turkaslan S et al., [10]	2007	22yr/M	Bilateral Permanent maxillary central incisor	Each incisor had one root
Tarasingh P et al., [2]	2010	2yr/M	Primary maxillary right central incisor	Presence of single pulp chamber and root canal
Tarasingh P et al., [2]	2010	8yr/M	Right Primary maxillary central incisor	Single root & root canal
Sener S et al., [11]	2012	17yr/M	Bilateral Permanent maxillary central incisor	The pulp chambers and root canals were large in both teeth, but there was only 1 of each
Sharada HL et al., [5]	2013	23yr/M	Permanent maxillary lateral incisor	Incomplete cleavage of the lateral incisor with single pulp chamber and root canal.
Rao PK et al., [8]	2013	25 yr/M	Bilateral maxillary central incisors	A radiolucent notch was observed in relation to the incisal edges of the central incisors. Relatively single large pulp chambers and root canals were observed in relation to permanent maxillary right and left central incisors.
Mazumdar P et al., [12]	2013	6yr/F	Permanent maxillary right central incisor	Showed a solitary large pulp chamber as well as canal but the pulp chamber was found to be obstructed by pulp stone and there was evidence of mild periapical radiolucency
Shokri A et al., [13]	2013	9yr/M	Bilateral Permanent maxillary central incisor	All the maxillary permanent central incisors showed one root with two separate canals having one orifice at the apical foramen.
Nandini DB et al., [6]	2014	4yr/M	Maxillary left first premolar	A single root and two crowns
Mahendra L et al., [14]	2014	27yr/M	Bilateral Permanent maxillary central incisor	Two completely separated roots were seen in the right maxillary incisors with central notching which was seen as a radiolucent line in the fused right maxillary incisor crown
Moushekhian S et al., [15]	2014	27yr/F	Permanent left lateral incisor	Macro tooth with two canals that were seen to be united in apical area *
Neena IE et al., [16]	2015	5yr/F	Primary maxillary right central incisors	Single pulp chamber and root canal
Rahman H et al., [17]	2016	19yr/M	Mandibular left first premolar	Single root was normal but it was wider cervically and conical in shape
Present case	2016	6 yr/ M	Primary maxillary right central incisor	Presence of two separate root canals *

**[Table/Fig-4]:** A review of clinical and radiographic features of gemination and twinning that were previously reported, together with the present case.

\* Two cases showed twinning along with the present case.

Many case reports of gemination involving primary and permanent dentition have been reported in literature [5,6]. However, occurrence of twinning in primary or permanent dentition is very rare. Therefore, this article documents a case of twinning involving primary maxillary left lateral incisor and also reviews clinical and radiographic findings of previous reported cases of gemination and twinning.

Tannenbaum and Alling, in 1963 defined gemination as the formation of the equivalent of two teeth from the same follicle, with an attempt for teeth to be incompletely separate, this indicated clinically by a depression or groove which might demarcate two teeth. Radiographically, there appears to be only one root canal. However, if the attempt is completely separate and two root canals are seen radiographically, it is termed as twinning. In gemination and twinning, if the bifid tooth is counted as one entity, the total number of teeth in the dental arch is otherwise normal [7].

Gemination has a higher prevalence in deciduous teeth, with a higher frequency in anterior maxillary region with equal sex predilection. Hence it is most commonly seen in maxillary primary incisors but is rare in permanent dentition. This anomaly has a large bifid crown which is incompletely separated that has single pulp chamber and root canal. However, the prevalence of twinned tooth is more in permanent dentition than primary. Twinned tooth shows a low deep groove from incisal to gingival third and is considered when the division results in equivalent structures consequentially leading to one normal and one supernumerary tooth. Radiographically, in twinning there will be only one pulp chamber with two root canals. Complete case history, clinical examination, and radiographic investigation can provide the information required for the distinction between gemination and twinning [8]. The tooth involved in our case was primary maxillary left lateral incisor.

The English language literature was reviewed on cases of gemination and twinning and all the findings were tabulated in [Table/Fig-4] [2,4-6,8,9-17]. Among all the 15 cases reported, only two cases were diagnosed as true twinning along with our case which showed complete cleavage of tooth bud, and radiographically showing

single pulp chamber and two separate root canals.

The aetiology of gemination and twinning remains unknown; however some of the interferences which occur during morphodifferentiation of the tooth germ are [6,14]:

1. Hereditary or congenital diseases;
2. Nutritional deficiency;
3. Local traumas;
4. Infectious/inflammatory processes;
5. Ionizing radiation is also considered;
6. Endocrine influences;
7. Excessive ingestion of medicines;

A group of molecular signalling pathways are concerned in the usual development of the tooth germ. These include components of the hedgehog, Wnt, MSX-1 and MSX-2, TNF, BMP Families, FGF, which provides a valuable basis of applicant genes that may potentially participate a function in human tooth formation. However, if inappropriately regulated by various causes mentioned above can lead to the formation of gemination/ twinning or fusion or additional teeth [3].

The problems, mostly if the anterior teeth are involved, differ from spacing problems, tooth malalignment, aesthetic problems, arch asymmetry, periodontal involvement and impeding the eruption of the adjacent tooth. Occurrence of deep groove in some cases of gemination and twinning makes them vulnerable to periodontal diseases and caries. When these defects are extremely deep and lengthen to gingival third, the probability of bacterial plaque build up in this area is high. Stringent oral hygiene practice is advised to preserve periodontal health [2,8]. In our patient, the anomaly caused a deep labial groove and was involved with caries; no serious periodontal disease was evident. The caries was removed and filled with GC 2 (Glass Ionomer Cement).

The anomalies of primary dentition are strongly associated with anomalies in the permanent dentition. Consequently, before time

diagnosis of the anomaly has a significant importance and it must be followed by cautious clinical and radiographic comments that will allow interference at suitable time.

## CONCLUSION

The present case is rare because it resembles to canine with deep labial groove and causing diastema between left maxillary primary central incisor and lateral incisor. Many cases of Gemination involving primary and permanent have been reported in literature. However, the present case of twinning involving primary dentition is extremely rare where the crown is bifid with two root canals. In the literature review, only two cases of twinning have been previously reported with the addition of present case.

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