Case Report

Fusion of maxillary central incisors with mesiodens

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Abstract

Fusion and gemination are developmental anomalies which are quite similar to each other but can be distinguished from each other if properly assessed. Fusion and gemination have been described as a result of developmental anomalies of dental tissues. The exact etiology is still unknown, but a genetic predisposition is suggested. This article highlights the importance of clinical and radiographic correlation in arriving at a definitive diagnosis.

Keywords: Fusion, gemination, maxillary central incisors, mesiodens

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INTRODUCTION

Developmental dental disorders may be due to abnormalities in the differentiation of the dental lamina and the tooth germ or abnormalities in the formation of dental hard tissue.[1] Odontogenic anomalies of number and form may occur in the primary and permanent dentition. These include gemination, fusion, and concrescence.

Fusion (twinning, synodontia) is known as the process of the twinning of two or more tooth germs, which develop separately at the dentinal level but become a single large tooth during odontogenesis at the time when the crown is not yet mineralized.[2-4]

Gemination (Schizodontia) differs from fusion, in the former, the tooth germ splits itself, and the dentinal structure usually shows two crowns, totally or partially separated, with only one root and one root canal.[5]

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Fusion is seen both in deciduous (0.5%–2.5%) and permanent dentition (0.1%) and more commonly seen in the mandibular anterior teeth. Its occurrence is generally unilateral, usually involving the lateral incisor and canine.[6] Twinning of a permanent and a supernumerary tooth, a type of fusion that usually involves maxillary anterior teeth, only shows a frequency of 0.1%.[7]

CASE REPORT

A 28-year-old male patient came to the private clinic with a chief complaint of severe pain in his upper front teeth.

Clinical examination

On examination, the patient had a full complement of permanent teeth. The maxillary central incisors appeared broader mesiodistally than usual. Right permanent maxillary lateral incisor was placed palatally between 11 and 13, and the left permanent lateral incisor was placed in the normal position between 21 and 23 [Figure 1]. This

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feature is suggestive of the fusion of permanent maxillary central incisors with mesiodens on both the sides.

Tooth number 11: A groove was present in the labial aspect of 11 which extended from the middle third to the incisal edge. Extensive discoloration was observed around the groove in 11, which was suggestive of deep caries extending into the pulp [Figure 2].

Tooth number 21 showed a huge crown mesiodistally without any indentations or fissures. In the lingual aspect of 21, there was a deep carious pit with extensive discoloration.

Radiographic examination

Intraoral periapical radiograph of maxillary anterior region revealed the presence of two roots and two root canals with a single huge crown in 11. Tooth number 21 revealed a huge crown with fused mesiodistally wide single root with two root canals with a Vertucci's type II root canal configuration [Figure 3]. In both the teeth, the caries was extending until the pulp.

The radiographic features are suggestive of incomplete fusion of 11 with mesiodens and complete fusion of 21 with mesiodens.

On vitality testing, both thermal and electrical pulp tests revealed no response in 11 and 21 suggestive of nonvital 11 and 21.

Treatment plan

The treatment plan was to extract 12, followed by endodontic treatment in 11 and 21 and later full coverage ceramic restoration in 11 and 21. Since the patient was not concerned about the esthetic problems due to macrodontia and his only concern was a pain, endodontic treatment was performed to relieve the pain, and the access cavity was restored with a composite restoration.

Treatment procedure

Under local anesthesia, access cavity preparation was done in 11 and 21 conventionally with a triangular outline, and later, the access cavity was modified and extended mesially to accommodate the additional pulp horn and distinct pulp chambers with canal orifices were found. K-file size 10 (Dentsply Maillefer, Ballaigues, Switzerland) were inserted into the orifice and the working length established [Figure 4]. The canals were instrumented using crown-down pressureless technique using rotary NiTi files (Protaper files, Dentsply) up to size F5. Copious irrigation with 2.5% sodium hypochlorite solution was used during the preparation. The canal system was dressed with a nonsetting calcium hydroxide paste and sealed temporarily with Cavit (ESPE, Seefeld, Germany). The canals were obturated with protaper gutta-percha points and AH plus sealer [Figure 5].

Figure 1: Palatal view of the fused maxillary anteriors

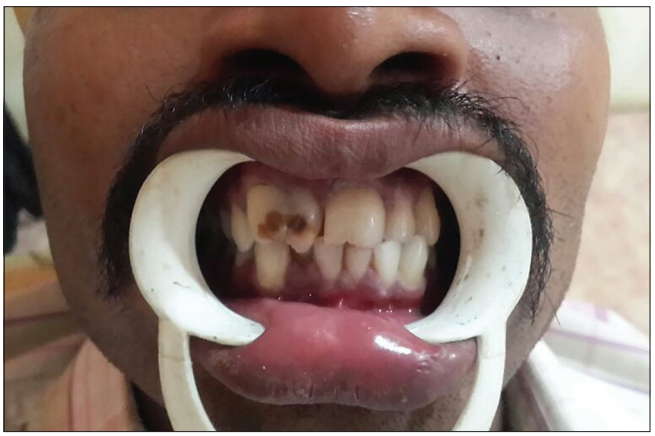

Figure 2: Labial view of the fused maxillary anteriors

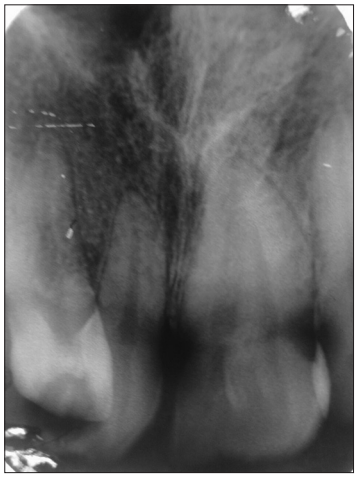

Figure 3: Preoperative radiograph of maxillary anteriors

DISCUSSION

The terminology dental fusion and gemination are used to define two different morphological dental anomalies

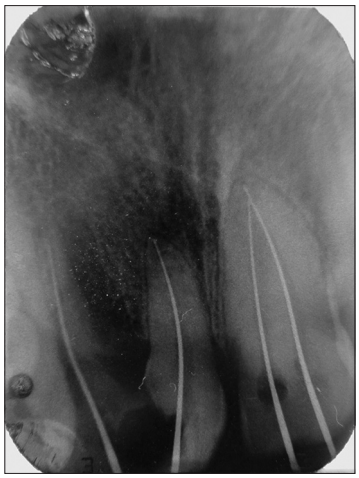

Figure 4: Working length radiograph of maxillary anteriors

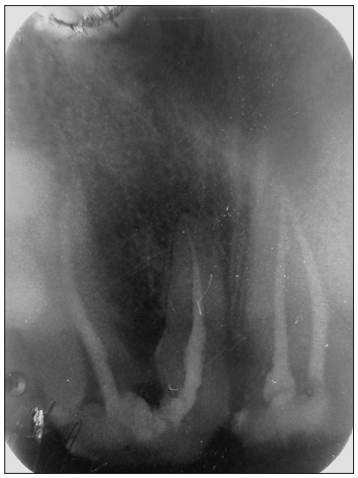

Figure 5: Obturation radiograph of maxillary anteriors

characterized by the formation of a clinically wide tooth. Despite the considerable number of cases reported in the literature, the differential diagnosis between these abnormalities is difficult.[8] Case history, clinical, and radiological examination can provide the information required for the diagnosis of such abnormalities.

Geminated teeth show one main root canal, which may present with a large voluminous pulp chamber or even two chamber.[9] Fused teeth may show two separate root canal system or it may show two endodontic systems with minor or major communication. Fusion can be classified into two types depending on the stage of development of teeth as complete and partial.[10]

In the present case, 11 showed a fusion of the crowns of the maxillary right central incisor and the supernumerary tooth, with two separate roots and root canal systems, suggestive of a partial fusion of maxillary right central incisor with the mesiodens. 21 showed a complete fusion of the crown and roots of the maxillary left central incisor and the supernumerary tooth with a single pulp chamber and two root canals which joined at the apex.

As far as the etiology of fusion is concerned, many theories have claimed genetic factors, local metabolic interference during tooth bud differentiation, traumatic, and inflammatory causes.[11] In the present case, the etiology can be attributed to genetic factors since the patient gave a history of similar occurrence of anomalies in the maxillary anterior teeth for his father and grandfather.

The possible clinical problems arising from the fusion of teeth in the anterior region would be esthetic problems due to space and periodontal defect due to the presence of deep groove which leads to plaque accumulation.[12] The development of these clinical sequelae require treatments varying from esthetic corrections to periodontal therapy and prosthetic rehabilitation. In the present case, the patient was not concerned about the esthetic problems due to macrodontia. The palatally placed right maxillary lateral incisor was extracted since it was interfering with the endodontic access cavity preparation. Patient's chief complaint was pain, which was relieved by doing endodontic therapy followed by composite restoration.

CONCLUSION

Fusion is a morphological alteration that sometimes is confused with gemination, but confirmed by thorough clinical examination and radiographic investigation. Since it is a developmental disturbance which can be encountered by the dentist in the clinics, complete knowledge of etiology, pathogenesis, and various treatment modalities available will contribute to the success of esthetic rehabilitation of the patient.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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