ISSN: 2581-5989
PubMed - National Library of Medicine - ID: 101738774

International Journal of Dental Science and Innovative Research (IJDSIR)
IJDSIR : Dental Publication Service
Available Online at: www.ijdsir.com
Volume – 5, Issue – 2, March - 2022, Page No. : 238 - 244

Endodontic and conservative management of an occurrence of bilateral geminated mandibular second premolars - Report of a case

[1]Dr. Anant Kumar A. Heda, Professor and Guide, Department of Conservative Dentistry and Endodontics, Dr. R. R. Kambe Dental College And Hospital, Akola.

[2]Dr. Akshita G Rathi, Post Graduate Student, Department of Conservative Dentistry and Endodontics, V.Y.W.S Dental College And Hospital, Amravati.

[3]Dr. Narendra Kumar Manwar, Professor and Guide, Department of Conservative Dentistry and Endodontics, V.Y.W.S Dental College and Hospital, Amravati.

[4]Dr. Neelam Rahul, Senior Lecturer, Department of Conservative Dentistry and Endodontics, V.Y.W.S Dental College and Hospital, Amravati.

[5]Dr. Deepashri Tekam, Senior Lecturer, Department of Conservative Dentistry and Endodontics, V.Y.W.S Dental College and Hospital, Amravati.

[6]Dr. Gayatri Deshmukh, Lecturer, Department of Conservative Dentistry and Endodontics, V.Y.W.S Dental College And Hospital, Amravati.

Corresponding Author: Dr. Akshita G Rathi, Post Graduate Student, Department of Conservative Dentistry and Endodontics, V.Y.W.S Dental College and Hospital, Amravati.

Citation of this Article: Dr. Anant Kumar A. Heda, Dr. Akshita G Rathi, Dr. Narendra Kumar Manwar, Dr. Neelam Rahul, Dr. Deepashri Tekam, Dr. Gayatri Deshmukh, "Endodontic and conservative management of an occurrence of bilateral geminated mandibular second premolars - Report of a case", IJDSIR- March - 2022, Vol. – 5, Issue - 2, P. No. 238 - 244.

Type of Publication: Case report

Conflicts of Interest: Nil

Abstract

Aim: The aim of the present case to report endodontic and conservative management of bilateral geminated mandibular second premolars.

Summary: Gemination is one of the rare developmental anomalies of teeth. Diagnosis is very important in such cases in order to treat them successfully.

This paper reports a rare case (0.02%-0.05%) of management of bilaterally geminated mandibular premolars, one of which was endodontically treated and other was treated conservatively. This case also stresses about the preventive management of geminated tooth having complex morphology, so that further complications can be avoided.

In this case, Cone Beam Computed Tomography (CBCT) was used, along with traditional radiographic diagnostic aids viz., Radio visiography (RVG) and Orthopantomograph (OPG)to record the radiographic details to help in the diagnosis and treatment planning.

Keywords: Gemination, Mandibular Premolars, Complex Morphology, Cone Beam Computed Tomography.

Introduction

Developmental dental anomalies may occur due to abnormalities in number, size and shape or in structure. These may be congenital, inherited, acquired or idiopathic. A wide range of developmental anomalies exists, including dens invaginatus, taurodontism, fusion, gemination etc. There is a direct co-relation between developmental anomalies and pulp and periradicular diseases that require a multidisciplinary treatment approach.[1]

Gemination is one of the developmental dental anomalies, caused due to an attempt to make two teeth from one enamel organ. The terms double tooth, joined teeth, Schizodontism are synonyms of gemination. [2][3]

According to American Association of Endodontics (2016), gemination can be defined as disturbance during odontogenesis, in which partial cleavage of tooth germ occurs and results in a tooth that has a double or 'twin' crown, usually not completely separated; there is a common shared root and pulp space.[1]

The prevalence rate of unilateral gemination is 0.5% in deciduous teeth whereas 0.1% in permanent dentition. Prevalence of bilateral gemination cases is 0.01% to 0.04% in primary dentition and only 0.02% to 0.05% in permanent dentition.4,5 It is more commonly seen in primary dentition than permanent. It is a rare occurrence in the posterior teeth.[6]

Case Report

The present case report is about a 14-year-old male patient reported to Department of Conservative Dentistry and Endodontics with chief complaint of pain in lower right posterior tooth region for 1 week. On clinical examination, molar resembling tooth was seen at place of second premolar in right mandibular region, having deep occlusal caries exposing pulp. On thorough clinical examination, morphologically similar second premolar tooth in lower left quadrant was seen with complex pit and fissure pattern, having no caries. The mesio-distal diameters of clinical crowns of these mandibular second premolars were larger than normal and they appeared like molars. These molar-resembling second premolars gave impression of three molars and only one premolar in both quadrants intraorally (Figure 1). Past medical history was taken to rule out for some systemic disesase. Past dental treatment history was taken to rule out any previous exodontia or orthodontic treatment. All the other teeth were having normal anatomy. Periodontal probing around these teeth and mobility were within physiological limits.

Radio visiography (RVG) revealed large occlusal radiolucency involving pulp with mandibular right second premolar. The mesio distal width of crown was equivalent to adjacent mandibular first molar, but only one completely developed conical root with one canal was present (Figure 2a). On the contralateral side, RVG revealed wide mesio distal width of mandibular left second premolar suggestive of gemination Figure 2(b).

The Orthopantomograph (OPG) revealed similar findings with respect to mandibular second premolars (Figure 3). OPG also revealed developing crowns of all third molars. These findings and normal root lengths of these teeth in mandibular second premolars positions

ruled out the possibility of over-retained primary second molars in these positions.

Cone Beam Computed Tomography (CBCT) images were analyzed for the root and root canal configuration. The cross sectional CBCT images showed one canal up to apical region with mandibular right second premolar (Figure 4).

Thermal tests and electric pulp test were carried out which showed delayed response with mandibular right second premolar. So, based on the chief complaint and clinical examination of the patient, a diagnosis of acute irreversible pulpitis was made.

Local anesthesia was given using 1.8 ml 2% lidocaine with 1:200,000 epinephrine. After rubber dam isolation, a conventional endodontic access opening was established with an Endo Access bur and an Endo Z bur (Figure 5a). Coronal enlargement was performed with a nickel-titanium Pro Taper SX rotary file to improve straight-line access. Root canal was explored with #10 K-files into the canal orifice followed by irrigation. Working length was determined using apex locator and confirmed by RVG (Figure 5b).

At the same appointment, cleaning and shaping were performed using Pro Taper (Dentsply) up to size F2 with a crown-down technique. Irrigation was performed using 2.5% sodium hypochlorite solution and 17% EDTA. Final rinse of the canal was performed using 2% chlorhexidine digluconate, and then dried with absorbent points and obturated with gutta-purcha cones using AH Plus resin sealer with lateral condensation technique. A final radiograph was taken to assess obturation (Figure 5d). After completion of root canal treatment, tooth was restored with packable composite restoration (3M ESPE).

Due to complex pit and fissure morphology of the geminated mandibular left second premolar, preventive treatment of pit and fissure sealant application was planned. Saucerization of the irregular pits and fissures was carried out, followed by acid etching with 37% phosphoric acid (3M ESPE). After rinsing and drying, bonding agent (3M ESPE Ivoclar Tetric N- Bond Universal) was applied and light cured. Placement of flowable composite (3M ESPE Filtek Z350xt) as a pit and fissure sealant was carried out and final light curing was done (Figure 6). A follow-up of 1 and 3 months was taken and patient reported with no complain.

Discussion

Gemination is an attempt of the division of developing tooth bud resulting in an incomplete formation of two teeth. Gemination is often confused with fusion. Fusion and gemination has been described as results of developmental anomalies of dental tissues. Gemination is a developmental anomaly of tooth shape, which is recognized as an unsuccessful attempt by a single tooth germ to divide by invagination resulting in a large single tooth with bifid crown and usually single root and root canal in which tooth count is normal when anomalous tooth is counted as one.[7][8]

Gemination results in mirror images of the coronal halves, whereas fusion takes place at an angle causing crooked appearance. The anatomy of pulp is useful in differentiating these double teeth. Geminated teeth usually have a single big root and root canal. The tooth with gemination most often shows two crowns either totally or partially separated with a single root and one root canal.[9]

The present case report is about case that is bilateral gemination of mandibular second premolar tooth. [9,10] The tooth crown is having larger mesio-distal diameter than average size of mandibular second premolar tooth. This molarization of premolars can be associated with

any syndromes. [11,12] Our patient had no associated disease or syndrome.

In this case, root canal morphology was confirmed with help of CBCT (Cone beam computed tomography). Complex internal anatomy has stressed importance of taking CBCT before starting endodontic treatment. [13,14,15,16]

In the present case, complex occlusal morphology was seen in lower left second premolar because of gemination. Complex pits and fissures are more prone to caries development than smooth surfaces of tooth which can be due to morphological complexity of these surfaces.[17] Pit and fissure sealants can be used as preventive measure for caries prevention.[18] [19]

Thus, in the present case, preventive treatment by pit and fissure sealant application was carried out for mandibular left second premolar.

Conclusion

CBCT confirmed the complicated morphology of root canal system in geminated tooth, and was vital in its successful endodontic treatment.

This case report demonstrates a predictable and successful endodontic management of a geminated right second premolar; and preventive pit and fissure sealant treatment of a geminated left second premolar. This case report also emphasizes on occurrence of bilaterally geminated mandibular second premolars.

References

1. Ahmed, H.M. and Dummer, P.M. (2018). A new system for classifying tooth, root and canal anomalies. International Endodontic Journal 51, 389-404.

2. Aguilo, L., Gandia, J.L., Cibrian, R. (1999). Primary double teeth. A retrospective clinical study of their morphological characteristics and associated anomalies. International Journal of Paediatric Dentistry 9, 175-183.

3. Eidelman, E. (1981). Fusion of maxillary primary central and lateral incisors bilaterally. Pediatric Dentistry 3, 346-347.

4. Neves, A.A., Neves, M.L.A. and Farinhas, J.A. (2002). Bilateral connation of permanent mandibular incisors: a case report. International Journal of Paediatric Dentistry 12, 61-65.

5. Grammatopoulos E. (2007). Gemination or fusion? Brazilian Dental Journal 203, 119-120.

6. Nandini, D.B., Deepak, B.S., Selvam an etal. (2014). Diagnostic dilemma of a double tooth: a rare case report and review. Journal Of Clinical and Diagnostic Research 8, 271-272.

7. Levites, T.C. (1965). Gemination, fusion, twinning and concrescence. Journal Of Dentistry for Children 32, 93-100.

8. Alvarez, I. and Creath, C.J. (1995). Radiographic considerations for supernumerary tooth extraction: report of case. Journal Of Dentistry for Children 62, 141-144.

9. Gupta S, Singla S, Marwah N. (2007). Synodontia between permanent maxillary lateral incisor and a supernumerary tooth: treatment prespective. Journal Oral Health Common Dental **1**, 52-55.

10. O'Reilly, P.M. (1990). Structural and radiographic evaluation of four cases of tooth fusion. Australian Dental Journal **35**, 226-229.

11. Canut JA and Arias S. (1999). Molarization of the lower second premolars. The Angle Orthodontist **69**, 380-381.

12. Gröndahl, H.G. and Huumonen, S. (2004). Radiographic manifestations of periapical inflammatory lesions: how new radiological techniques may improve

endodontic diagnosis and treatment planning. Endodontic Topics 8, 55-67.

13. Chhabra, N., Singbal, K.P. and Chhabra, T.M. (2013). Type I canal configuration in a single rooted maxillary first molar diagnosed with an aid of cone beam computed tomographic technique: A rare case report. Journal Of Conservative Dentistry 16, 385-387.

14. Subbiya, A., Kumar, K.S., Vivekanandhan, P. etal (2013). Management of mandibular first molar with four canals in mesial root. Journal Of Conservative Dentistry 16, 471-473

15. Kothari, H.J. and Kumar, R. (2013). Endodontic management of a mandibular second premolar with perforating internal resorption by using MTA and cone beam computed tomography as a diagnostic aid. Journal Of Conservative Dentistry 16, 380-384.

16. Nunes, E., Moraes, I.G.D., Novaes, P.M.D.O. (2002). Bilateral fusion of mandibular second molars with supernumerary teeth: case report. Brazilian Dental Journal 13, 137-141.

17. Kitchens, D.H. (2005). The economics of pit and fissure sealants in preventive dentistry: a review. Journal Contemporary Denalt Practice **6**,95-103.

18. Sree devi A, Mohamed S. (2017). Pit and Fissure Sealants. In Stat Pearls. Oct 5 [Internet].

19. Naaman, R., El-Housseiny, A.A. and Alamoudi, N. (2017). The use of pit and fissure sealants— A literature review. Dentistry Journal 5,34.

Legend Figures

Figure 1: Occlusal photograph showing geminated premolars in both the quadrants in the mandible

Figure 2(a): RVG showing large occlusal radiolucency involving pulp with mandibular right second premolar (geminated)

Figure 2(b): RVG mandibular left second premolar showing gemination.

Figure 3: OPG revealing geminated premolars in the mandible.

Figure 4: CBCT image in different cross sections and reconstruction showing single root and large crown with mandibular second premolars confirming bilateral gemination.

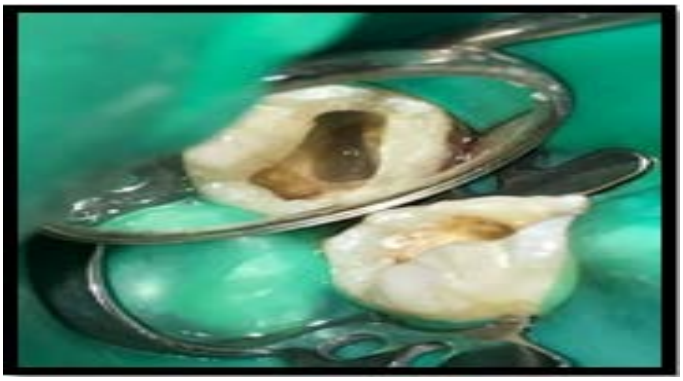

Figure 5a: Conventional endodontic access opening.

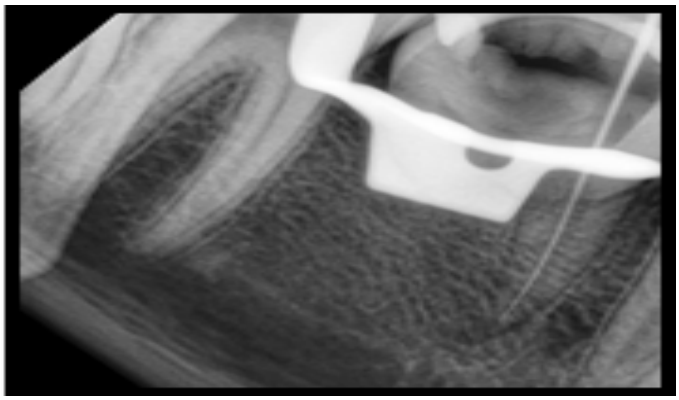

Figure 5b: Working length was determined by RVG.

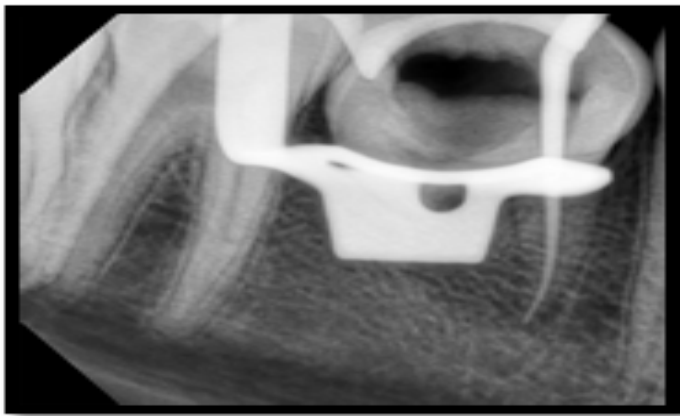

Figure 5c: Master cone RVG

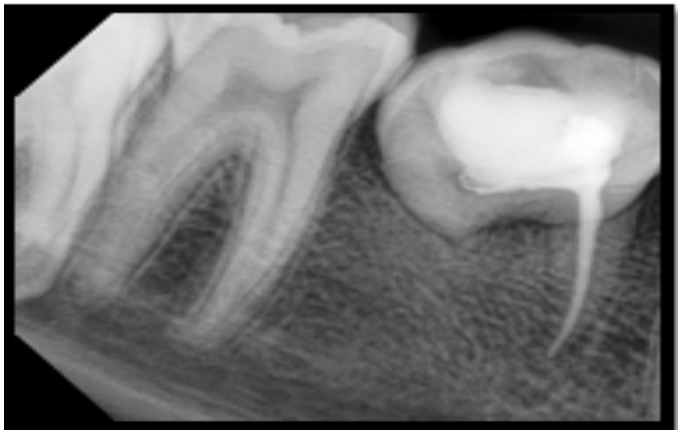

Figure 5d: Post obturation RVG.

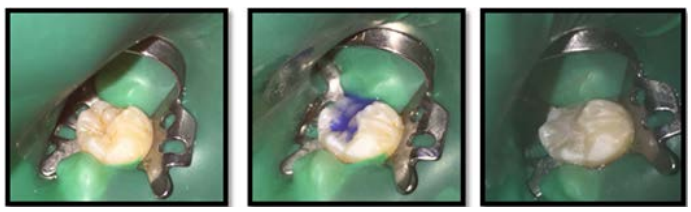

Figure 6: Pit and Fissure Sealant Application

Table: 1 Prevalence rate of gemination in deciduous and permanent teeth

	Deciduous teeth	Permanent teeth
Unilateral gemination	0.5%	0.1%
Bilateral gemination	0.01%-0.04%	0.02%-0.05%