

An Unusual Case Report of Maxillary Lateral Incisor Fused with a Supernumerary Tooth

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Successful endodontic management of teeth with odontogenic anomalies is quite challenging. Fusion is a condition where crowns of two individual teeth have been joined together during crown development. Though fusion occurs infrequently, it could predispose to caries and periodontal disease because of the abnormal tooth morphology. Here is a rare case of fusion of maxillary lateral incisor with a supernumerary tooth with a palato-gingival groove treated by multidisciplinary approach and its successful follow up.

Key words: Fusion, Supernumerary tooth, Palato-gingival groove, Maxillary lateral incisor.

Root canal morphology is highly complex and has extreme variations. Successful endodontic treatment of this complex infrastructure poses a great challenge in teeth with odontogenic anomalies, which makes the case more interesting. Anomalies may be in shape of the teeth, size or number and it requires additional care to treat these cases successfully. Various terminologies such as fusion, germination, concrescence, twinning, double tooth etc are used to describe such kind of anomalies¹.

Pindborg defined fusion as the union between dentin and /or enamel of two or more separate tooth germs and gemination as the division of a single tooth germ resulting in a bifid crown, and single root². Fusion is more common in deciduous than in permanent dentition³. Fusion involves epithelial and mesenchymal germ layers resulting in irregular tooth morphology⁴. Literature gives evidence that the prevalence rate of fusion ranges from 0.5%-2.5%⁵

The present article reports a unique case of fusion of maxillary lateral incisor with a supernumerary tooth with two roots and two root canals, which was treated successfully by a multidisciplinary approach.

Case report

A female patient aged 20 years reported to our department with the chief complaint of pain in upper front tooth region for the past six months. She gave a history of episodes of swelling with sinus discharge which subsided on taking medication.

On clinical examination, upper left lateral incisor possessed excessive mesiodistal width, but the tooth count was same when the fused teeth were counted as one. Fusion of lateral Incisor with supernumerary tooth was observed on the labial surface and a palato-gingival groove was observed on the palatal surface (Fig. 1&2). A pocket depth of about 4 mm was detected close to the palato-gingival groove. Pain on percussion and palpation was present and the tooth did not respond to vitality tests.

Radiographic examination showed fusion of upper left lateral incisor and a supernumerary tooth with a periapical radiolucency (Fig. 3). It was provisionally diagnosed as fusion, in maxillary lateral incisor showing a palato-gingival groove, that predisposed to retrograde pulpitis with chronic

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apical periodontitis. Treatment plan was endodontic management followed by periodontal treatment.

Access cavity preparation was done under rubber dam isolation and two separate canals were located, one on the mesial aspect and other on the distal aspect of 22 (Fig. 4). Initially size 10 k file was used to establish a glide path and working length was determined using size 15 k files (Fig. 5). Canal orifices were enlarged using #2 and #3 gates glidden drills. Crown down preparation was done using protaper rotary files and both the canals were enlarged up to ISO size 40. Calcium hydroxide was placed as intra-canal medicament for two weeks.

Obturation was done by lateral condensation using zinc oxide eugenol as sealer

The patient was referred to the Department of Periodontics for management of the palato-gingival groove. A palatal flap was raised and the

palato-gingival groove was present at the fusion line extending just below the cemento-enamel junction. The groove was curettaged and the flap repositioned.

The patient was completely asymptomatic after the treatment and post-operative intra oral periapical radiograph taken after six months and follow-up after one year showed healing of the periapical lesion in relation to 22 with reduction in diameter of the lesion from 8 mm to 3.5 mm (Fig. 7- 8).

DISCUSSION

Fusion may be partial or total depending upon the stage of tooth development at the time of union: fusio-totalis, partialis-coronaries, partialis-radicularis. The etiology may be attributed



Fig. 1. Labial view of the pre-operative photograph showing maxillary left lateral incisor fused with supernumerary tooth



Fig. 2. Palatal view



Fig. 3. Pre-operative digital panoramic radiograph showing periapical lesion in relation to 22



Fig. 4. Access cavity preparation showing two separate canal orifices

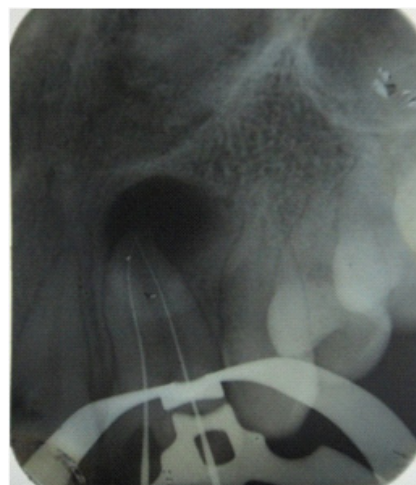


Fig. 5. Working length determination



Fig. 6. Immediate post-operative IOPA

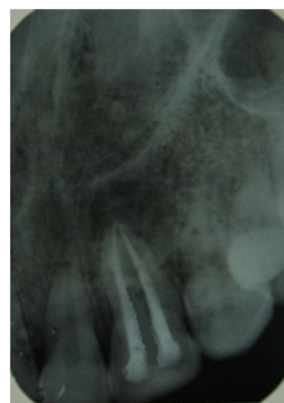


Fig. 7. IOPA Six months post-operative showing healing of lesion



Fig. 8. One year post-operative IOPA showing complete resolution of the lesion

to physical force or pressure leading to prolonged contact of the adjacent tooth follicles causing fusion of tooth buds^{1,6}.

According to Lowell and Solomon, fused teeth result from some physical action that causes the young tooth germs to come into contact, thus producing necrosis of the intervening tissue, thus allowing the enamel organ and dental papilla to fuse together⁷.

Gemination is a developmental anomaly where, a single tooth germ attempts to divide, resulting in a single large tooth with a bifid crown and usually a common root and root canal. The tooth count is normal in gemination when the anomalous tooth is counted as one. Whereas, fusion

is the union of two separate tooth buds during odontogenesis and here the tooth count is less than normal when the affected tooth is counted as one. However, this rule may not apply in cases where fusion involves a normal tooth and a supernumerary tooth^{8,9}. Our case is a similar one involving fusion of maxillary lateral incisor with supernumerary tooth.

Rubber dam placement was not very easy, as the tooth was broader mesiodistally. Since a groove was present on the palatal surface, it was difficult for the prongs of the rubber dam clamp to achieve retention on the palatal surface. In such cases, a small layer of composite can be placed on the palatal surface so that the prongs can rest apical to the composite layer. Opening the access in a fused tooth is much more challenging than a normal tooth. The anomalous tooth, though it is fused, cannot be considered as a single tooth. So, two separate access cavities were prepared, considering the involved tooth as two individual teeth. If a single access cavity had been prepared, then excess of tooth structure might be lost which may weaken the involved tooth. It was taken care to insert the files separately into two access cavities parallel to the long axis of the tooth. Mostly, in fusion cases, one root canal will be straight and the other may be slightly angulated. In such cases, gaining access to the orifice should be modified based on the radiographic picture. Both the root canals were found to be joining at the apex. Preparing the access cavity and gaining straight line access for the initial file till the apex is the challenge in teeth with odontogenic anomalies. After obtaining a straight line access, the rest of the case goes without a glitch.

Cleaning and shaping was carefully done in the two canals separately, with copious irrigation and recapitulation. 5.25% sodium hypochlorite, saline and 2% chlorhexidine were used for irrigation. Both the canals were prepared up to ISO size 40 and obturated by lateral condensation.

Whenever fusion occurs, the groove created by the union of the involved teeth is deep and extend subgingivally which readily provides room for bacterial plaque accumulation¹⁰. Pulpal involvement is common in such teeth and endodontic treatment is quite challenging because of the complex tooth anatomy and difficulty in rubber dam isolation¹.

A palato-lingual groove is also termed as disto-lingual groove or radicular lingual groove in the dental literature. It commonly occurs on the palatal surface of maxillary lateral incisors. It starts near the cingulum of the tooth and runs towards the cemento-enamel junction in the apical direction at various depths along the root surface¹¹. This represents an infolding of the enamel organ and epithelial sheath of Hertwig¹².

The palato-lingual groove may or may not communicate with the pulp cavity and the periodontal tissue. But it can be an etiological factor for endodontic or periodontal lesion even in the absence of trauma, caries or restoration. It is the irregular funnel shaped feature on the lingual aspect that can harbor bacteria and debris leading to bacterial ingress through this groove along the root surface causing detachment of the junctional epithelium leading to periodontal breakdown which in turn affects the pulp, making it secondarily affected.

In our case, though a groove was observed on the palatal surface, it did not extend till the apex and it stopped at the cement-enamel junction. So a restoration of the groove was not required in our case. Curettage was done followed by closure of the flap.

CONCLUSION

This case report discusses the successful management of a case of fusion in maxillary lateral incisor with a one year follow-up. A thorough knowledge about the tooth anomalies is mandatory for a clinician to identify the complicated cases, which need special care during treatment procedures. A multidisciplinary approach is necessary for a long term prognosis of such challenging cases.

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