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IP International Journal of Maxillofacial Imaging

Journal homepage: www.ijmi.in

Case Report

An uncommon trio: Supernumerary tooth with dens invaginatus & fusion with adjacent permanent tooth

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Abstract

Dental anomalies such as supernumerary teeth, dens invaginatus, and tooth fusion are uncommon, and their simultaneous occurrence is extremely rare. This case report describes an 11-year-old female patient who presented with crowding in the maxillary anterior region. Clinical examination revealed a conical supernumerary tooth in close proximity to the right lateral incisor. Cone beam computed tomography (CBCT) confirmed fusion between the supernumerary tooth and the permanent lateral incisor involving enamel, dentin, and roots, with a noted communication between the pulp spaces. Additionally, CBCT revealed the presence of dens invaginatus within the supernumerary tooth. This unique presentation highlights the importance of advanced imaging in diagnosing complex anomalies, ensuring accurate treatment planning, and preventing potential complications.

Keywords: Supernumerary tooth, Dens invaginatus, Tooth fusion, CBCT, Dental anomaly.

Received: 29-06-2025; **Accepted:** 15-09-2025; **Available Online**: 30-09-2025

1. Introduction

Dental anomalies are diverse and can significantly impact both the aesthetics and functionality of the dentition. Dens invaginatus, or "tooth within a tooth," is a developmental anomaly characterized by an infolding of the enamel organ into dental papilla.[1] Fusion between adjacent teeth is a relatively rare phenomenon, in which two different tooth buds are fused into one during the development stage.[2] In particular, fusion between a permanent lateral incisor and a supernumerary tooth presents a unique challenge for diagnosis and treatment, especially when complicated by the presence of dens invaginatus in the supernumerary tooth. This case report discusses a rare case of a supernumerary tooth having dens invaginatus and fusion with a permanent lateral incisor, highlighting the relevance of CBCT for diagnosing such complex dental anomalies.

2. Case Report

A 11-year-old female patient reported to our department in the year 2024 with a chief complaint of crowding in upper front teeth. On clinical examination, a conical supernumerary tooth was noted labial to right lateral incisor. Both teeth seem to be in close proximity to each other. Since crowns of supernumerary tooth and 12 were in close proximity to each other without clear separation, a possibility of fusion was suspected (**Figure 1**). CBCT was advised for assessment of the same along with extend of root development.

Cone beam computed tomography scan was acquired using Planmeca Promax 3D MiD extra- oral imaging system, using small FOV (ø 4cm x 5cm) with 0.2 mm maximum resolution. 3D reconstructed image showed a conical supernumerary tooth labial to palatally placed 12 (**Figure 2**). Supernumerary tooth was having a mesiolabial rotation with the distal surface in close contact with labial surface of 12.

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https://doi.org/10.18231/j.ijmi.96093.1759225362

Figure 1: Clinical photograph

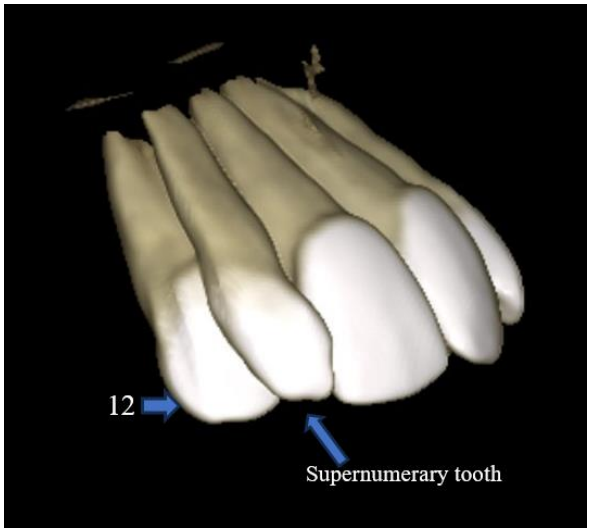

Figure 2: 3D reconstructed image

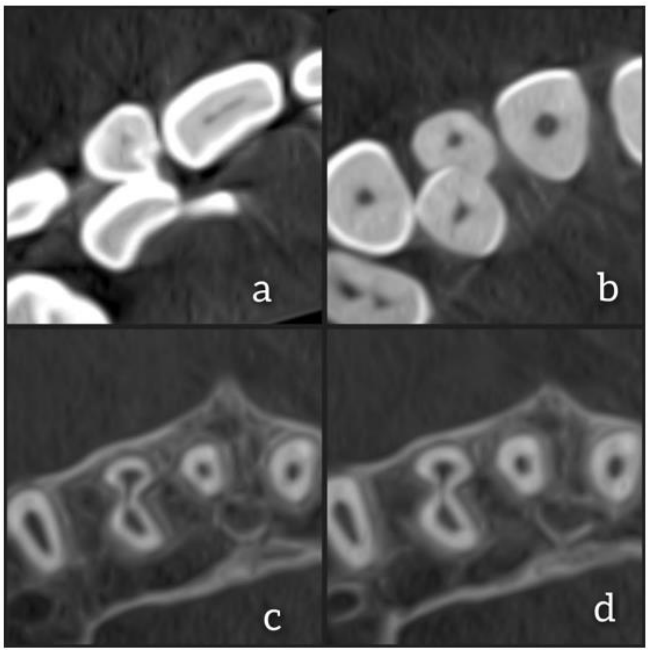

Figure 3: Axial section showing **a)** Fusion between enamel of supernumerary tooth and 12 at the level of mid-crown region **b) and c**): Fusion between dentin of supernumerary tooth and 12 at the level of cervical and apical region of root respectively. **d)**: Communication between pulp spaces of supernumerary and 12

Serial sections showed fusion of enamel and dentin along the entire length of labial aspect of 12 and palato-distal aspect of supernumerary tooth (**Figure 3**a,b,c). In the apical third, along with fusion of roots, a communication was also noted between pulp spaces of both teeth (**Figure 3**d). A small hypodense area was noted within cervical third of crown of the supernumerary tooth palatal to pulp space, outlined by a hyperdense shadow with density values similar as that of enamel, which was extending till the palatal pit, and was consistent with dens invaginatus (**Figure 4**).

The patient provided informed consent to the publication of this case.

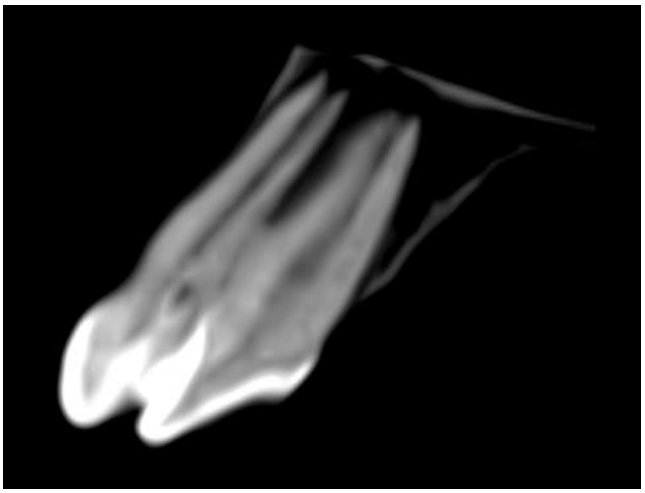

Figure 4: Sagittal section showing dens invaginatus in supernumerary tooth

3. Discussion

Hyperdontia or supernumerary tooth can be defined as a developmental anomaly where number of teeth is excess than the normal.[1] Supernumerary teeth can be classified into conical, tuberculate, supplemental and odontoma depending upon their shape.[3] Dens invaginatus is a developmental anomaly of the tooth that results from the invagination of the enamel organ into the dental papilla during the soft tissue stage of tooth development. Once hard tissue forms, the invaginated enamel organ creates a small tooth-like structure within the future pulp chamber. This condition is also referred to as invaginated odontome, dilated gestant odontome, or dens in dente. The first description of dens invaginatus in a human tooth was provided by a dentist named Socrates in 1856.[4] Dens invaginatus are mostly accidental findings on radiographs. Clinically, signs such as unusual crown morphology e.g., dilated, peg-shaped, or barrel-shaped gives the clue for presence of dens invaginatus.[5] Dens invaginatus can occur in all dentitions with a prevalence ranging from 0.25% to 7.74%.[6] The teeth most frequently affected are the permanent maxillary lateral incisors, though premolars, canines, and, more rarely, molars may also present with dens in dente.[7]

The most commonly used system for classifying dens invaginatus is Oehlers classification. In Type I, the invagination is confined to the crown of the tooth. Type II is characterized by a deeper invagination that extends beyond the cemento-enamel junction into the root but remains within the root canal system. Type III involves an invagination extending past the cemento-enamel junction that establishes communication with the periodontal ligament either laterally or through a second apical foramen.[8] Association of dens invaginatus with a supernumerary tooth is a very rare phenomenon, with only 11 such cases reported in the literature till date.[9]

Dental fusion is described as the union of dentin and/or enamel of two or more developing teeth. The extent of fusion depends on the stage of tooth development at the time of union, and it may present as either partial or complete. The condition is observed more frequently in the primary dentition, with a reported prevalence of 0.5–2.5%, compared to the permanent dentition.[10] Fusion between a permanent tooth and a supernumerary tooth is unusual and its differentiation from gemination is challenging as in both cases total tooth number is increased.[8] Simultaneous occurrence of tooth fusion and dens invaginatus in a supernumerary tooth is an extremely rare occurrence, and has not been reported in literature till date.

4. Conclusion

The occurrence of fusion between a permanent tooth and a supernumerary tooth, accompanied by dens invaginatus in one of them, is exceptionally rare. Cone Beam Computed Tomography (CBCT) proved invaluable in evaluating this complex dental anomaly, providing detailed three-dimensional imaging that enabled precise assessment.

5. Source of Funding

None.

6. Conflict of Interest

None.

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Cite this article: Sheela AJ, Haris PS, Kumar NR, Pekkodath B, Devaraj DK. An uncommon trio: Supernumerary tooth with dens invaginatus & fusion with adjacent permanent tooth. *IP Int J Maxillofac Imaging*. 2025;11(3):110–112.