Dens in Dente and Fusion Occuring in Two Supernumerary Teeth: Report of An Unusual Case

Abstract

Although dens in dente and fusion are well-known and well-established dental anomalies, they are rarely seen in supernumerary teeth. Fusion has a negative impact on esthetics especially when it occurs in maxillary anterior teeth. This paper reports an unusual case of dens in dente and fusion occurring in two anterior supernumerary teeth and their treatment.

Keywords

Dens in dente, Fusion, Supernumerary teeth

Özet

Dens in dente ve füzyon iyi bilinen ve iyi tanımlanmış dental anomaliler olmasına rağmen süpernúmerere dişlerde nadiren görülürler. Füzyon özellikle maksiller anterior dişlerde oluştuğunda estetik problem yaratır. Bu makalede, süpernúmerere iki anterior dişte nadir görünen dens in dente ve füzyonun birlikte görüldüğü bir olgu rapor edilmiştir.

Anahtar Kelimeler

Dens in dente, Füzyon, Süpernumere diş
INTRODUCTION

Dental anomalies are associated with both the primary and the permanent dentitions and can affect either the morphology or the number of teeth. Although these anomalies occur infrequently, they can cause esthetic, spacing and periodontal problems.

Dens invaginatus is a rare malformation of tooth showing a wide spectrum of morphological variations. Teeth in both maxillary and mandibular arches may be affected, but the permanent maxillary lateral incisors are the most commonly involved teeth. The invagination ranges from a slight pitting to an anomaly occupying most of the crown and root. Tooth crowns as well as roots may exhibit variations in size and form. Cases of dental invaginations in supernumerary tooth have been presented. Studies have revealed an incidence ranging from 0.25% to 10%.

The affected tooth radiographically shows an infolding of enamel and dentine which may extend deep into the pulp cavity and into the root and sometimes even reach the root apex. Radiographic examination shows a radiopaque invagination equal to the enamel density. In general, the radiographic evaluation shows a periapical lesion of the affected teeth. The pulp may remain vital if the invagination extends from the crown to the periradicular tissue and has no communication with the root canal system. The treatment of a tooth with dens invaginatus ranges from conservative restorative procedures to non-surgical root canal therapy, surgery or extraction.

Tooth fusion is defined as a union between the dentine and/or enamel of two or more separate developing teeth. The fusion may be either partial or total depending on the stage of tooth development at the time of the union. Although the aetiology of this anomaly is still unknown, the influence of pressure or physical forces producing close contact between two developing teeth is the probable cause. Fusion associated with a supernumerary tooth such as mesiodens and various cases has been described in the literature. Radiographic examination is necessary to obtain the correct diagnosis. Several treatment methods have been described in the literature with respect to the different types and morphologic variations of fused teeth.

This report describes a rare case of fusion of two supernumerary teeth and dens in dente of a supernumerary tooth.

CASE REPORT

A 20-year-old male (S.A.) was referred to the Oral Diagnosis and Radiology Clinics with a chief complaint of “bad looking teeth”. Medical and dental histories were non-contributory and there was no previous trauma to the teeth or jaws.

Clinical evaluation indicated that the patient was a healthy man with no other physical abnormalities. Intraoral examination revealed the maxillary right and left central incisors were positioned vestibularly and two ectopic supernumerary teeth were located in the usual anatomic position of the permanent central incisors (Fig 1). There were developmental grooves on the facial and palatal surfaces of the left supernumerary tooth. The lateral incisors had normal shapes and positions. The canines were missing bilaterally and we learned the history of extraction for both of them. Percussion, palpation sensitivity, and mobility tests were normal. There was no significant periodontal pocketing and there was a negative response to pulp testing on the right supernumerary tooth. The left supernumerary tooth showed no significant periodontal pocketing but was sensitive to percussion and gave a negative response to electrical pulp test. Radiographic examinations (panoramic and periapical) showed right supernumerary tooth had a shortened, wide atypical root and was diagnosed as fusion of two supernumerary teeth (Fig 2). The left supernumerary tooth had dens in dente view and irregular diffuse periapical radiolucency was diagnosed as chronic apical abscess (Fig 3).
Upon consultations with the Departments of Prosthetic Dentistry and Orthodontics, the determined treatment option was orthodontic alignment of permanent central incisors following extraction of the fused and invaginated tooth. This treatment option was discussed with the patient; however, he preferred extraction of the supernumerary, invaginated tooth, central incisors and a fixed prosthetic restoration to be done.

After extractions teeth were examined histologically. Ectopic central incisors were in normal histologic pattern and nothing pathologic has been seen. Left supernumerary tooth diagnosed as dens in dente histologically.

HISTOLOGICAL EXAMINATION

Light microscopy

Two atipic meziodens teeth and two ectopic located teeth from the same patient were rapidly fixed in %10 phosphate buffered formalin, they were decalcified in De Castro solution, then they were dehydrated through graded alcohols and processed for routine light microscopy. Specimens embedded in paraffin blocks and 5 μm sections were cut and stained by haematoxylin and eosin (H&E), Verhoeff, Schmorl's bone staining method and methylen blue according to standard protocol. And observed on Olympus BH2 microscope.

RESULTS

In sections from left supernumerary teeth, light microscopic observations showed a pathological structure considering dens in dente. There was pathologic immature tooth organization appeared in the pulp of main tooth. Immature pathologic tooth existing pulp, irregular dentin tubules and enamel, and these structures were appeared to locate transversally in the root region of the main tooth. Examination of this immature pathologic tooth revealed prominently abnormal histological structure with its irregular dentin tubules and pulp (Fig 4). As indicated by
different special staining methods, pulp of this immature tooth composed of a calcified connective tissue. It was interesting to observe partially calcified, bone like tissue in this pathological structure’s pulp. Surrounding this pathological immature tooth, the main tooth existed a normal histological structure by pulp containing loose connective tissue; odontoblasts located closed to dentin, regular dentin tubules and well organized enamel.

Similarly; light microscopic examination of right supernumerary tooth revealed an abnormal histological structure with wide atypical root and fusion of two teeth. The fused immature tooth was near the root of the main tooth and out of the cementum that was surrounded by dentin. We observed a bone-like structure in its pulp as well.

We obtained good results by Schmorl’s staining which is recommended for any decalcified bone tissue. This is the one of the staining methods for decalcified bone paraffin sections developed by Schmorl et al.\textsuperscript{19} This staining provides us with better option to decide more accurate and satisfactory observation indicating the blue stained osteoblasts in calcified collagen fibers.

Two ectopic located central incisors were observed to have normal histological structure.

**DISCUSSION**

In this case, fusion of two supernumerary teeth and dens in dente of a supernumerary tooth has been presented. Synonyms of dens invaginatus are; dens in dente, invaginated odontoma, dilated gestand odontoma, dilated composite odontoma, tooth inclusion and dentoid in dente. Although over the last decades several theories have been proposed to explain the etiology of this malformation, it is controversial and remains unclear\textsuperscript{2, 7}. The clinical morphology of the crown of the affected tooth may range from being normal to presenting an unusual form depending on the size of the invagination. In some cases, the labiolingual diameter of the crown can be greater.
than normal as in this case. In most severe forms the tooth usually presents a conical crown. In most cases, dens invaginatus is detected by chance during radiographic examination. Clinically, unusual crown morphology or a deep foramina coecum may be important sign. If one tooth is affected, contra-lateral tooth should also be examined. A detailed radiographic examination is therefore essential if the anomaly is suspected. It is also advisable to take radiographs from various angles to provide a better understanding of the extensions of the anomaly. In our case; the tooth had an atypic form, sensitive to percussion and gave negative response to electrical pulp testing. After intraoral and radiographic examinations, maxillary left supernumerary tooth was diagnosed as having dense in dente and chronic apical abscess.

Dental literature shows a wide range of treatment choices for invaginated teeth. When pulpal or periapical pathosis develops, modifications to the treatment approach are required. Function and esthetics, type of invagination, configuration of the root canal system, prosthetic requirements, time constraints, economic and psychological considerations are determinant factors for the choice of treatment. Extraction is indicated as a last choice of treatment only in teeth with severe anatomical irregularities and in supernumerary tooth that can not be treated non-surgically or with apical surgery. However, our patient did not accept the treatment choices and he preferred extraction along with prosthetic rehabilitation.

Fusion is defined as the joining of two developing tooth germ resulting in a single large tooth structure. Clinically anomaly may result in esthetic problems and thus may require some kind of endodontic, restorative, surgical and/or endodontic treatment. Dental literature presents various cases that show fusion of the permanent tooth with supernumerary teeth. The most common supernumerary tooth is the “mesiodens” located between maxillary central incisors that usually has the form of a cone-shape crown with a short root. Clinically, it may be difficult to differentiate fusion when supernumerary tooth is fused with a permanent tooth. However, differentiation may not be critically important while accomplishing treatment. It is obvious that it is more difficult when a fusion developed with two supernumerary teeth.

Most authors agree that there seems to be no sex difference and location of the malformation. It is usually restricted to the canine-incisor region. The frequency distribution appears to be 0.5% in the primary dentition and 0.1% percent in the permanent dentition. Structurally, there is always a union between the dentin of the fused tooth which can vary from partial to complete fusion of both roots and crowns. Consequently, pulp chambers may be separated or common to both teeth. A radiographic examination is necessary to obtain a correct diagnosis. In our case a short root and only one root canal was clearly visible on the radiograph. Because of the crown form and short root, we diagnosed it as fusion of the two supernumerary teeth.

Case reports on fusion of teeth appear frequently in dental literature and several treatment methods have been described with respect to the different types and morphological variations of fused teeth. Separation and removal of the least desirable portion is indicated as long as there is a satisfactory crown-to-root ratio for the retained part of the tooth. Depending on the situation, necessary endodontic treatment and prosthetic restoration could be done successfully. Some authors believe that this type of solution is more desirable than extraction and prosthetic restoration.

Every case has its own condition and treatment. Scientific criterion must be used for choosing treatment method along with the patients' desires. As in this case, extraction and prosthetic restoration were the chosen treatment option due to the patient’s preference.
REFERENCES


CORRESPONDING ADDRESS

Serdar UYSAL DDS, PhD
Hacettepe University Faculty of Dentistry, Department of Oral Diagnosis and Radiology, 06100 Ankara/TURKEY
Tel: +90 312 305 22 09 Fax: +90 312 305 42 21 e-mail: suysal@hacettepe.edu.tr