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Professor İlknur ÖZCAN

Correspondence Address
Biruni University Facult of Dentistry
Protokol yolu Caddesi No:45 Topkapı
Zeytinburnu/İSTANBUL
edr@biruni.edu.tr

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FROM THE EDITOR

We are very pleased to announce to you that our journal, Eurasian Dental Research, which is a new scientific journal in the field of dentistry, has started its publication life.

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We will be happy to see your scientific studies and articles in Eurasian Dental Research, the journal of our Faculty.

Prof. Dr. İlknur ÖZCAN
Editor in Chief

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CONTENTS

Prevalence of Dental Anomalies in a Group of Turkish People

Şükriye Neslihan ŞENEL[1], Tamer Lütfi ERDEM[2], Merve YELKEN KENDİRCİ[3]

Abstract

Aim Dental anomalies in tooth number, shape, and position usually result in aesthetic and functional problems. These anomalies can affect both primary teeth and permanent teeth. Careful clinical and radiologic examination are required to diagnose the condition and establish appropriate treatment. The purpose of this study is to determine the prevalence of dental anomalies in a group of Turkish population and to compare our findings with literature knowledge.

Material and method Retrospective orthopantomographs (OPGs), which were already taken in the Department of Oral and Maxillofacioal Radiology of Istanbul University Faculty of Dentistry, of a total of 5000 patients (2480 males, 2520 females) were examined for the presence of the teeth with number, size, position, shape, structure and root anomalies. The cases with dental anomalies were recorded according to localization (maxilla, mandible) and gender.

Results A total of 1295 patients were found to have dental anomalies. 135 patients were found to have more of one dental anomaly. The distribution by sex was 645 males (12,9%), and 650 females (13%). The most common dental anomaly was number anomaly (490 patients), followed by position anomaly (410 patients).

Conclusion This study, which was about the prevalence of dental anomalies, revealed that dental anomalies occur more frequently in the maxilla than the mandibula and the prevalence did not differ between men and women.

Keywords Orthopantomography, Prevalence, Study retrospective, Tooth abnormalities, Turkish people

Introduction

The concept of dental anomaly refers to abnormal changes in the color, number, shape or size of primary or permanent teeth. The etiology of these conditions is usually attributed to congenital, developmental and acquired factors (1,2,3). Congenital dental anomalies have genetic origin. The development of teeth begins in the sixth week of intrauterine life. Developmental factors associated with dental anomalies occur during the development of teeth. Acquired dental anomalies occur after tooth development is complete (2,4).

Numerous studies have been conducted on dental anomalies in different populations. The prevalence of dental anomalies has been reported at different rates in different studies due to factors such as different populations, patient groups and age ranges in the studies (1,2,5).

Intraoral radiographs, ortopantomographs (OPGs), orthodontic study models and medical photographs were used for the detection and diagnosis of number, size, shape, structure, location and root anomalies. OPG, which enables the combined examination of the teeth in the lower and upper jaws and adjacent anatomical structures in radiographic examination, has advantages such as low radiation dose and low cost (2,6,7,8).

Congenital tooth agenesis constitute the most common anomaly of the human dentition, The congenital absence of six or more permanent teeth other than the third molars is called oligodontia, while hypodontia is the absence of fewer than six teeth. In studies conducted in different countries, the incidence of congenital tooth deficiency has been reported between 0,2% and 26,1% (7,9).

The aim of this study is to determine the prevalence of different dental anomalies.

Material and Methods

Digital ortopantomographies which were already acquired in the Department of Oral and Maxillofacioal Radiology of Istanbul University Faculty of Dentistry, with KODAK 8000 Digital Panoramic System (Rochester, New York) between January 2012-December 2013 were evaluated. The selection criteria of the study group are:

1. No important medical history, such as trauma to the jaw bones.
2. No edentelous jaws.
3. No history of metabolic disorders or genetic syndrome affecting bone and tooth formation.
4. No cleft lip and/or palate, and craniofacial anomalies.
5. No poor quality of radiographic images.

Correspondence: Şükriye Neslihan ŞENEL, neslihan.senel@istanbul.edu.tr

[1] Istanbul University, Faculty of Dentistry, Department of Dentomaxillofacial Radiology, Istanbul, Turkiye

[2] Atlas University, Faculty of Dentistry, Department of Dentomaxillofacial Radiology, Istanbul, Turkiye

[3] Biruni University, Faculty of Dentistry, Department of Dentomaxillofacial Radiology, Istanbul, Turkiye

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5000 orthopantomographs of 2480 male and 2520 female patients were included in the study. Two different radiologist assessed the radiographs respectively and they recorded the cases with number, size, shape, structure and root anomalies according to gender and localisation (maxilla or mandible).

Statistical Analysis

The data obtained in this study were analyzed using statistics including prevalence and percentage values.

Results

Alterations in number of teeth

The term anodontia describes the congenital absence of all primary or permanent tooth. Total anodontia is a very rare anomaly, whereas oligodontia, which is the absence of six or more teeth, and hypodontia, which is characterized by the absence of less than six tooth, are more common (5,7, 23).

In this study, none of the patients has total anodontia. 385 patients (7,7%) have hypodontia or oligodontia. The common congenital abscence was seen in upper laterals (5,1%), followed by upper third molars (3,96%) and lower second premolars (3,8%). Anomalies related to missing teeth as seen below (Table 1).
A case of oligodontia with more than six permanent tooth germ deficiency as seen in Figure 1.

Table 1: Placement of missing teeth according to jaws.

	Central incisor	Lateral incisor	Canine	First premolar	Second premolar	First molar	Second molar	Third molar
Upper jaw	0	255	25	35	190	0	35	198
Lower jaw	40	45	10	10	105	10	40	90

Figure 1: The orthopantomograph of a 23 years old male patient with oligodontia. The germs of the teeth number 12, 13, 14, 15, 18, 22, 23, 25, 28, 38, 32, 41, 42, 48 were absent.

Mesiodens is a supernumerary tooth that occurs in the anterior maxilla in the midline region near the maxillary central incisors. The tooth crown may be cone-shaped with a short root or may resemble the adjacent teeth. Mesiodens is the most common supernumerary tooth. Paramolar is a supernumerary tooth in the molar region. Distomolar is a supernumerary tooth that is distal to the third molar (10,11,12).

A total of 105 patients have supernumerary teeth. Mesiodens was the most common supernumerary tooth and was seen in 73 teeth (1,46%) followed by distomolars 25 (0,5%). 125 (2,5%) supernumerary teeth was seen in maxilla and 10 of them (0,2%) in mandible. Anomalies related to supernumerary teeth as seen below (Table 2). A case of mesiodens in the upper jaw as seen in Figure 2.

Table 2: Placement of supermerary teeth according to jaws.

	Mesiodens	Central incisor	Lateral incisor	Canine	Premolar	Paramolar	Distomolar
Upper jaw	73	0	10	15	5	5	25
Lower jaw	0	0	10	0	0	0	0

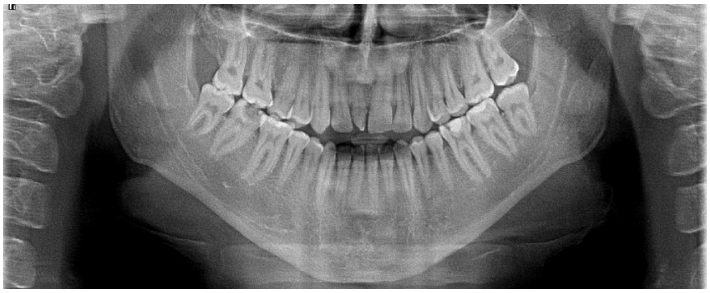

Figure 2: The orthopantomograph of a 38 years old male patient. Mesiodens is seen between the middle incisors in the upper jaw.

Alterations in size of teeth

The term macrodontia, which is one of the anomalies related to the size of the teeth, refers to teeth that are too large than normal, while the term microdontia refers to teeth that are very small than normal (13,14).

215 patients (4,3%) have alterations in size of teeth. Microdontia was seen mostly in third molars, 180 teeth (3,6%), followed by upper and lower laterals 10 teeth (0,2%). None of the patients has macrodontia. Anomalies related to size size of teeth as seen below (Table 3). A case of microdontia in the right upper jaw as seen in Figure 3.

Table 3: Placement of microdont teeth according to jaws.

	Central incisor	Lateral incisor	First molar	Second molar	Third molar
Upper jaw	0	5	5	10	180
Lower jaw	5	5	0	0	0

Figure 3: The orthopantomograph of a 32 years old female patient. A microdont third molar is seen in the upper jaw.

Alterations in position of teeth

Teeth that stay in the jawbone altough their time of eruption and cannot take their normal position are called impacted teeth. The most frequently impacted teeth are third molars, followed by upper canine teeth. Ectopic teeth are teeth that are in a different position than the dental arches in the jaw bones due to genetic or orthodontic problems. Tooth transposition is a rare condition of ectopic eruption. It is defined as an interchange in the

position of two permanent adjacent teeth (6,9).

In our study, 410 patients (8,2%) have anomalies of position. The most common positional anomaly is impacted third molar, 220 teeth (4,4%), followed by impacted canine, 135 teeth (2,7%). In addition, we observed 5 ectopic teeth (0,1%) and 15 teeth transposition (0,3%), which are position anomalies other than impacted teeth. Anomalies related to the position of teeth as seen below (Table 4). A case of impacted third molars as seen in Figure 4.

Table 4: Placement of position anomalies according to jaws.

	Canine	First premolar	Second premolar	Second molar	Third molar	Ectopic teeth	Transposition
Upper jaw	83	2	4	4	80	1	4
Lower jaw	52	1	6	18	140	4	11

Figure 4: The orthopantomograph of a 30 years old male patients. Impacted right and left third molars are seen in the upper jaw.

Alterations in shape of teeth

Although both conditions are often confused with each other, fusion is known the joining of the enamel and dentin of two different teeth, and gemination is the incomplete attempt of a single tooth to separate. Dens invaginatus is a rare malformation that occurs when the enamel and dentin bend into the pulp. Dens evaginatus is a developmental anomaly that occurs by a little protrusion of enamel from occlusal surface of a tooth. Taurodontism is an uncommon anomaly which characterized with the enlargement of pulp chambers with the furcation area being displaced toward the apex of the root (4, 15, 16).

In our study, fusion, gemination, dens invaginatus, dens evaginatus, and taurodontism were investigated in order to identify teeth with shape anomalies.

The most common shape anomaly in the study group was dens evaginatus (2,3%). 0,1% patients have fusion, 0,2% patients have dens invaginatus and 0,4% patients have taurodontism. Gemination was not seen in our study. A case of taurodontism in upper and lower molars as seen in Figure 5.

Alterations in structure of teeth

Amelogenesis imperfecta (AI) is a hereditary anomaly that affects the structure and content of enamel in both primary and permanent teeth. The enamel of teeth affected by AI is usually easily eroded, discolored or heavily pitted. There are three most common types of AI: hypoplastic, hypocalcified, and hypomature. Dentinogenesis imperfecta(DI) is a rare autosomal dominant disease affecting primary and permanent teeth.

Figure 5: The orthopantomograph of a 15 years old male patient. Taurodont upper and lower molars are seen in the right and left maxilla and mandible.

In dentinogenesis imperfecta, the teeth are bluish-gray or yellowish-brown, the dentin is fragile, the roots are thin. Three different types of dentinogenesis imperfecta have been reported by researchers: DI type 1 is seen with Osteogenesis imperfecta, although DI type 2 is similar to type 1, Osteogenesis imperfecta is not seen. DI Type 3 is only seen in the Brandywine community of Maryland, USA. Dentin dysplasia (DD) is rare autosomal dominant affecting dentin and root formation of teeth. Dentin dysplasia is classified into 2 types which are Type I (DD-1) is the radicular type, and type II (DD-2) is the coronal type (4, 17, 18).

In this study, 3 patients have amelogenesis imperfecta. None of the patients has dentinogenesis imperfecta or other dentin anomalies.

Root Anomalies

The most common anomaly among the root anomalies seen in the jaws is dilaceration and has been defined as excessive curvature of the tooth root. Hypercementosis is excessive cementum deposition on tooth root. Short root anomaly is characterized by teeth with normal crown length and very short and blunt root. Accessory root canal is a developmental anomaly that occurs in the primary and permanent teeth. Accessory root anomaly can often be seen in lower anterior teeth, lower premolars or lower first molars (3, 12, 19).

In our study, 265 patients (5,3%) have root anomalies. 165 patients (3,3%) have short root, 56 patients (1,12%) have supernumarary roots, 34 patients (0,68%) have dilaceration and 10 patients (0,2%) have hypercementosis. Prevalence of root anomalies as seen below (Figure 6). A case of short root anomaly as seen in Figure 7.

Discussion

Dental anomalies are mostly of genetic or developmental origin and cause orthodontic, functional and aesthetic problems in patients. Studies investigating the frequency of dental anomalies in different countries have been carried out by various researchers, as well as studies investigating the frequency of dental anomalies in orthodontic patients or investigating the frequency of a specific anomaly (1, 2, 4, 5, 6, 7, 9, 16, 17).

In the present study, the prevalence of number, size, position, shape, structure and root anomalies in a 5000 patients was investigated and a total of 1295 (25,9%) patients were found to have dental anomalies. 135 (2,7%) patients were found to have more of one dental anomaly and no significant difference was found be-

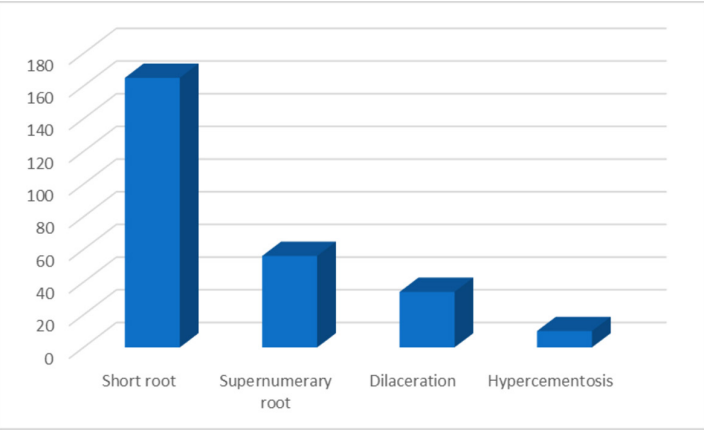

Figure 6: The prevalence of root anomalies.

Figure 7: The orthopantomograph of a 23 years old male patients. Short root anomaly is observed in the incisors and canine teeth in the lower jaw. This anomaly occurred because the patient received radiotherapy from the head and neck region in his childhood.

tween men and women in terms of dental anomaly frequency.

Arslan et al. (2) reported the prevalence of dental anomalies as 6.9% in their study and found that the incidence of dental anomalies in females (7,34%) was higher than in males (5,30%). AlHumaid et al.(3) and Bilge et al. (20) also reported the incidence of dental anomaly to be 36,3% and 39,2% in their study, respectively, and the frequency of dental anomalies in women was higher in both studies. Baron et al.(5) investigated the prevalence of dental anomalies in 551 orthodontic patients. Dental anomaly was found in 31,58% of the patients and more than one dental anomaly was detected in 14,16%. There was no statistically significant relationship between dental anomaly frequency and gender. Laganà et al. (21) reported reported the prevalence of dental anomalies as 6,9% in their study and found that the incidence of dental anomalies 20,9% in the study group and found no difference between men and women. Although our study shows similar features with other studies in the literature, there are some differences in some ratios. The reasons for the different results found in the studies in the literature are the racial differences due to the fact that they are performed in different countries, the study groups consisted of different numbers of patients, and some dental anomalies was not evaluated in some studies.

In our study the most common dental anomaly is number anomaly. 490 (9,8%) patients have number anomaly. While hypodontia or oligodontia was observed in 385 (7,7%) patients, supernumerary teeth were detected in 105 (2,1%) patients. Baron et al. (5), Kositbowornchai et al. (7), and Aren et al.(22) in their studies they reported that the most common dental anomaly was hypodontia and found the rates of 5,81%, 26,1% and 1,77%, respectively. Arslan et al. (2) and AlHumaid et al. (3) number anomalies were found to be the second most common anomaly, with rates of 1,72% and 24,77%, respectively. The reason for the different results in the studies is that certain age groups are excluded from the evaluation in some studies, and the third molar teeth are excluded from the evaluation in some studies.

The most common positional anomaly was found impacted third molars followed by impacted upper canines in different studies. Position anomalies were found to be the second most common anomaly in our study. Arslan et al.(2) reported in their study that the most common anomaly was position anomaly with a rate of 4,09%. The most common positional anomaly was impacted teeth. The most frequently impacted tooth was found to be the upper canine (67%). Third molars were not included in the study because they showed too much variation in terms of position and morphology. Bilge et al. (20) reported that the most common anomaly was impacted teeth, and in a study in which 1200 patients were evaluated, they found the rate of impacted teeth to be 45,53%. Patil et al. (24) reported that the third molar teeth were the most impacted teeth, similar to our study, and reported the incidence of impacted teeth as 15,5%. Gupta et al.(9) reported that the most common dental anomaly was positional anomaly and found that the most common positional anomaly was rotation with a rate of 10,24%. The reason for the different rates in the studies carried out is that the studies were conducted in different countries and some studies did not include third molar teeth.

In this study we found 215 patients (4,3%) which have size anomalies. Microdontia was seen mostly in third molars (3,6%), followed by upper and lower laterals (0,2%). AlHumaid et al.(3), Altuğ-Ataç et al. (14) and Aren et al.(22) reported the rate of size anomalies as 1,72%, 1,61% and 0,54%, respectively. These rates are quite low compared to our study. The results we found in our study are higher than these studies. Kositbowornchai et al. (7) reported the rate of size anomalies as 15,6% in orthodontic patients whom they investigated before treatment. It is thought that the reason why the rates found in this study are very high compared to other studies is that dental anomalies are more common in orthodontic patients.

Dens evaginatus was the most common shape anomalies of the teeth and it was seen at a rate of 2,3% in our study. Besides Dens evaginatus 0,1% patients have fusion, 0,2% patients have dens invaginatus and 0,4% patients have taurodontism. Gemination was not seen in our study. In studies conducted in different countries, shape anomalies such as fusion and gemination are observed very rarely. Arslan et al. (2) reported in their studies that the incidence of gemination is 0,18% and the incidence of dens in dente is 0,09%. AlHumaid et al. (3) reported that the prevalence of taurodontism is 0,09%. Altuğ-Ataç et al. reported that the incidence of the fusion is 0,23% and the incidence of gemination is 0,07%. Gupta et al. (9) reported that the prevalence of microdontia is 2,58%, the prevalence of dens evaginatus is 2,40% and the prevalence of taurodontism is

2,49%. The findings of our study are consistent with the results of studies published in the literature.

In our study, the least common dental anomaly was the structural anomaly. We found that 3 patients have amelogenesis imperfecta. None of the patients has dentinogenesis imperfecta or other dentin anomalies. Baron et al.(5) found in their study 1 patient with amelogenesis imperfecta and they did not found any dentin anomalies or cases of regional odontodysplasia. Gupta et al. (9) reported 2 patients with amelogenesis imperfecta and 1 patient with dentinogenesis imperfecta. Altuğ-Ataç et al. (14), they evaluated 3043 pediatric patients in their study and reported that 13 patients had amelogenesis imperfecta. The reason for the high rate of teeth with structural anomalies in the aforementioned study is that both primary and permanent teeth can be seen together due to the fact that the patients evaluated were children.

Our findings about root anomalies showed that 165 patients (3,3%) have short root, 56 patients (1,12%) have supernumarary roots, 34 patients (0,68%) have dilaceration and 10 patients (0,2%) have hypercementosis. AlHumaid et al. (3) reported that the most common dental anomaly is dilaceration with a rate of 30,2%. They found that mandibular third molars had highest number of dilacerations (21%). Baron et al.(5) reported that the incidence of dilaceration is 0,18%. Kositbowornchai et al (7). reported that the prevalence of mandibular first molars with three roots is 0,2% and the prevalence of hypercementosis is 1,2%. Guttal et al.(12) reported that the incidence of dilaceration is 39%. Bilge et al. (20) reported that the prevalence of dilaceration is 6,41%. Patil et al. (24) reported that the incidence of dilaceration is 0,5%. The reason for the different rates in these studies is that the studies were conducted in different countries and the study groups consisted of different numbers of patients.

Conclusion

This study was conducted to determine the frequency of dental anomalies in the Turkish population. It was found that 1295 (25,9%) patients have dental anomalies and 135 (2,7%) patients have more than one dental anomaly. Our findings showed that there was no diffence between men (12,9%) and women (13%).

Dental anomalies are one of the common clinical problems. Although dental anomalies are often asymptomatic, they cause aesthetic and orthodontic problems. Treatment planning of dental anomalies is necessary after a comprehensive clinical and radiological examination. Since dental anomalies may show different rates in different patient groups, it is important to know their symptoms and types well.

Limitations

In our study, Retrospective panoramic radiographs, which were already recorded in the Department of Oral and Maxillofacioal Radiology of Istanbul University Faculty of Dentistry, a total of 5000 patients (2480 males, 2520 females) were examined. Since this study was a retrospective evaluation of radiographs, we did not perform intraoral examinations of the patients and radiographic images could not be compared with clinical examination findings. Therefore, anomalies such as Carabelli tubercle, which can be seen more clearly in clinical examination, were not included in the study.

In this study, the evaluation of dental anomalies was made with orthopantomographs. Although orthopantomography is a method that allows the examination of the lower and upper jaws and adjacent structures together and has a lower effective dose compared to cone beam computed tomograpraphy (CBCT), there may be errors in the image due to disadvantages such as magnification and superposition. For this reason, image errors will be minimal in a retrospective study with CBCT images taken previously.

Declarations

Author Contributions: *Conception/Design of Study- M.Y.K., N.S.; Data Acquisition- M.Y.K., N.S.; Data Analysis/Interpretation- M.Y.K.; Drafting Manuscript- M.Y.K., N.S.; Critical Revision of Manuscript- T.L.E.; Final Approval and Accountability- T.L.E.; Material and Technical Support- T.L.E.; Supervision- T.L.E.*

Conflict of Interest: *Authors declared no conflict of interest.*

Financial Disclosure: *Authors declared no financial support.*

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Etiopathogenesis and Symptoms in TMJ Muscle-Pain Dysfunction Syndrome

Gül AYKANAT[1]

Abstract

Aim In this study, the importance of knowing the pathological conditions and symptoms that may lead to TMJ muscle joint pain dysfunction syndrome in terms of diagnosis and treatment was emphasized in the light of the literature.
Material and method A total of 70 patients, 52 women and 18 men, aged between 19 and 37, were included in the study.
Results Etiological causes and predisposing factors that may lead to TMJ muscle-pain dysfunction syndrome were investigated by considering the classifications in the literature. Malocclusion was detected in 41 (58.5%) of 70 patients, while 22 patients (31.4%) received psychological treatment.
Conclusion In conclusion, it is emphasized that the variations in clinical images and the pathogenesis should be taken into account in determining the treatment and plan of TMJ muscle pain dysfunction syndrome. In addition, due to the lack of specific standardized measurement techniques for this syndrome, it is difficult to easily understand the outcome of each cause alone. Since diagnosis constitutes a very important step in the treatment of diseases, the importance of detailed anamnesis, clinical and radiological examination is emphasized in our study.

Keywords Dysfunction syndrome, Etiopathogenesis, Muslce, Muscle pain, TMJ

Introduction

TMJ muscle pain-dysfunction syndrome is indicated as painful spasm of masticatory muscles with dysfunction. This syndrome is clinically characterized by difficulty in mouth opening, pain, crepitation, sensitivity on palpation, and mandibular deviation (1, 2). Thus, the limitation of mandibular movements and lack of coordination were accepted as the basic criteria for dysfunction, and it was especially distinguished from other joint diseases with similar symptoms to this entity. This new and important view in TMJ diseases has fundamentally changed the clinical approach. The importance of emotional tension has been emphasized in controlled studies (3). The differences of opinion about the etiology of this syndrome are naturally reflected in the treatment method. As it is understood from the researches carried out to date, it is difficult to distinguish the cause with precise boundaries. For this reason, they are intertwined in the etiological classifications, and one can be the cause of the other. Distinguishing the causes leading to the syndrome gains importance in determining the treatment plan. Palliative, cause-oriented treatments or supportive treatments can be planned according to etiological reasons (4-6).

Although many clinical symptoms have been reported in this syndrome, the findings considered as cardinal symptoms are pain, sensitivity on palpation of masticatory muscles, decrease in maximum mouth opening capacity, limitation in chewing movements (7, 8).
Diagnosis of TMJ muscle pain dysfunction syndrome is facilitated by one or more pathognomonic symptoms. However, if the pathogenesis and prognosis for each case are not specified, the diagnosis will be incomplete. In the literature, it has been emphasized that etiopathogenesis and clinical symptoms should be considered in the diagnosis and treatment plan of this syndrome (4, 9).

In this study, the importance of knowing the pathological conditions and symptoms that may lead to TMJ muscle joint pain dysfunction syndrome in terms of diagnosis and treatment was emphasized in the light of the literature.

Material and Methods

A total of 70 patients, 52 women and 18 men, aged between 19 and 37, were included in the study. As a result of the anamnesis and clinical and radiological examinations taken from the patients, TMJ muscle pain dysfunction syndrome were diagnosed. In this study, the etiological and predisposing factors that may cause this syndrome were investigated. Traumas, dental treatments, chronic oral habits, pain, difficulty in chewing movements and mouth opening, presence of spontaneous pain, whether the pain increases with pressure or movement, local or reflected pain was examined. In clinical examination, crepitation, pain on palpation of TMJ and masticatory muscles, limitation of jaw movements and mandibular deviation were investigated. Maximum mouth opening capacity was measured as an objective evaluation criterion. Lower and upper jaw models of each patient were prepared and their closing relationships and missing teeth were recorded.

Results

Etiological causes and predisposing factors that may lead to TMJ muscle-pain dysfunction syndrome were investigated by

Correspondence: Gül AYKANAT, gaykanat@biruni.edu.tr

[1] Biruni University, Faculty of Dentistry, Department of Prosthodontics, Istanbul, Turkiye

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considering the classifications in the literature. Malocclusion was detected in 41 (58.5%) of 70 patients, while 22 patients (31.4%) received psychological treatment.

When chronic oral habits were classified, the highest rate was bruxism. Bruxism is present in 49 patients (70%). Nail biting habits were found in 14 patients (20%), and jaw shifting was found in 31 patients (44.2%). In 34 patients, both bruxism and jaw shifting movements were detected. Most of the missing teeth of 48 (68.5%) patients were premolars and molars. The main symptoms of this syndrome are pain, crepitation, sensitivity in chewing muscles, limitation of jaw movements and deviation. In addition, maximum mouth opening capacity was measured as an objective finding in our study. The mean maximum mouth opening capacity was 38 mm in women and 37.4 mm in men.

Pain is usually seen unilaterally in the angulus mandible, ear and temporal region. Pain was the first complaint of the patients and was the reason for applying to our faculty. 61 of the patients (87.1%) state that they suffer from chronic pain. As pain localization, they specified the front of the ear and the temporal region. Local pain was 33% and referred pain was 67% in TMJ. When the referred pain is divided according to the regions, it spreads to the tragus, anterior ear, mandible, maxilla, and zygomatic bone. In addition, 38 of these patients complain of headache.

In our clinical examination, sensitivity to palpation was observed in the masticatory and neck muscles. In our study, it was clear that crepitation is a common finding in TMJ muscle pain dysfunction syndrome. There was crepitation in 37 patients (52.8%) and mostly unilateral.

Limitation and deviation in jaw opening movements due to pterygoid muscle spasm is another finding. There was limitation in jaw movements in 57 patients (81.4%), and deviation in 12 (17.1%) patients. The distribution of the accompanying symptoms is as follows: there were 35 patients (50%) with only pain and crepitation, 4 patients (5.7%) with pain and deviation, 33 (47.1%) patients with crepitation and limitation of jaw movements, and 5 patients (% 7,1) with pain, crepitation and deviation.

Discussion

In epidemiological and clinical data, TMJ muscle pain dysfunction syndrome is more common in women than in men. This study was consistent with the data in the literature, and the number of female patients was in the majority. In addition, the mean age of 31.4 years in the study group corresponds to the typical mean age of 30 years reported in this syndrome (10).

Pain in TMJ muscle pain dysfunction syndrome has been reported as 87% in the literature (11). In our study, the percentage of pain was 87.1%. It has been reported that referred pain mostly affects the TMJ and tragus regions. In our study, the spread of pain was mostly found in this region. While some researchers report that crepitation is one of the most common findings in this syndrome, some researchers give rates varying between 48-69% (12, 13).

In epidemiological studies, it is stated that crepitation is also high in the normal population, which increases the rate of crepitation (9). When pathological conditions and symptoms that may cause TMJ muscle pain dysfunction syndrome are examined, a wide variety of causes and rates are observed. Occlusion disorders, according to some authors, is the most important cause playing a role in the etiology. It has been reported that the loss of bilateral posterior teeth and the removable and fixed prostheses cause excessive contraction of the chewing muscles when they are not performed in a certain discipline (6). In our study, loss of premolar and molar teeth was 70%.

Although it has been stated that trauma to the head and neck is a contributing factor to pain and dysfunction, our patients have no history of trauma. Chronic oral habits are also reported to cause spasm and pain in the masticatory muscles. In epidemiological studies, the bruxism index has been reported to be around 60%. In our study, the rate of bruxism was found to be 70%.

In studies on the etiology of TMJ muscle pain dysfunction syndrome, there are many authors who agree with the psychogenic aspect of the condition (3). In this study, 22 patients who are thought to have a primary role in emotional stress are observed. In a study, this rate was reported as 52%. However, it is stated that the phenomenon started suddenly in patients in this group, spontaneous remissions occur, and the psychological state worsens the results.

In TMJ muscle pain dysfunction syndrome, it is observed that the mean values of mouth opening capacity decrease due to pain and muscle spasm. This measurement has been reported as a minimum of 49.4 and a maximum of 58.6 mm in normal individuals (7). The average value we obtained in this study is 37.1 mm. This value indicates that mouth opening movements are restricted.

TMJ diseases and dysfunctions are closely related to all branches of dentistry. The problems that have arisen in parallel with the development of civilization in today's societies have made TMJ complaints a current issue. The chewing system is an extremely complex system. The etiology of such disorders is complex and not easily understood. For this reason, it was stated that knowing the pathological conditions and symptoms that may lead to the syndrome is very important in terms of diagnosis and treatment planning, and the data of our research were compared with the studies on this subject.

In conclusion, it is emphasized that the variations in clinical images and the pathogenesis should be taken into account in determining the treatment and plan of TMJ muscle pain dysfunction syndrome. In addition, due to the lack of specific standardized measurement techniques for this syndrome, it is difficult to easily understand the outcome of each cause alone. Since diagnosis constitutes a very important step in the treatment of diseases, the importance of detailed anamnesis, clinical and radiological examination is emphasized in our study.

Declarations

Author Contributions: *Conception/Design of Study- G.A.; Data Acquisition- G.A.; Data Analysis/Interpretation- G.A.; Drafting Manuscript- G.A.; Critical Revision of Manuscript- G.A.; Final Approval and Accountability- G.A.; Material and Technical Support- G.A.; Supervision- G.A.*

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Investigation of the Use of Accidentally Exposed to Light X-Ray Films With Artificial Solarization Method as a Duplicate

Gülsün AYDOĞMUŞ[1], Oyun Erdene BATGEREL[1]

Abstract

Aim Observing the outcomes of the artificial solarization method in the use of blue light-sensitive extraoral films as duplicates due to accidental light exposure.
Material and method Two groups were formed using two different extraoral films (Kodak T Mat G and Agfa Curix) and these films were exposed to light. Then the films were prepared by placing them under the master copy films. Some of the films in each group were exposed to sunlight, while others were exposed to ultraviolet light as an artificial solarization method (Feket printing equipment). These duplicate films were then processed.
Results Duplicate films obtained from sunlight produced slightly better results than artificial solarization, and Agfa films produced a better image than Kodak films.
Conclusion The film method, which was duplicated by artificial solarization, is not a useful method for radiology clinics.

Keywords Film, Light sensitivity, Sunlight, Ultraviolet, X-ray

Introduction

The accidental opening of extraoral film boxes in daylight is one of the most unpleasant situations encountered in radiology clinics. As a result of being exposed to sunlight, these films become unusable and cause financial harm to clinics. To avoid this, the researchers attempted to make these films reusable as duplicates by using sunlight (1-2-3). However, depending on the season, days without sunlight appear to be a disadvantage.

The purpose of this study is to evaluate the outcomes of the artificial solarization technique in the use of blue-sensitive extraoral films used as duplicates as a result of unintentional light exposure.

Material and Methods

In this study, two groups were formed and a different brand of blue-sensitive extraoral film was used in each group. While Kodak T Mat G extraoral films (Eastman Kodak Company, Rochester, New York) were used in one group, Agfa Curix extraoral films (Agfa-Gevaert Group, Mortsel, Belgium) were used in the other group. These films were deliberately exposed to sunlight at the beginning of the study. Panoramic radiographs obtained previously under normal conditions in both groups were used as master copies. At this stage, the 'photographic print frame' or 'visor' used in photography was chosen as the cassette containing both the film exposed to light and the master copy radiography. In the cassettes, the master copy films were placed on top and the extraoral films exposed to light were placed on the bottom. In the first phase of the research, the cassette containing the two films was placed in sunlight for 15-20 minutes to reproduce the images of the panoramic radiograph onto the light-exposed film. The light-exposed film was processed, resulting in a duplicate radiography of the panoramic radiography. In the second stage, ultraviolet light was used instead of sunlight for the artificial solarization process.

Feket printing equipment (70x100 cm) (Feket Company, Turkey) was used as an ultraviolet light source. This apparatus is used for copying prints in printing with ultraviolet light. The cassettes were prepared as in the previous step and exposed to ultraviolet light for 10 minutes. The resulting duplicate films were processed by reducing the contrast of the routinely used film baths by half.

Results

Duplicate films exposed to sunlight produced slightly better images than duplicate films exposed to ultraviolet light. However, when these films were exposed to ultraviolet light, the image became extremely foggy and blurry. As a result, it has been demonstrated that artificially solarized films cannot be used as duplicates. Agfa brand films produced better images than Kodak brand films.

Discussion

The printing of films using special emulsions known as "daylight films" uses the method employed in this study. In radiology, sunlight is used as a quick and easy method to examine films that have unintentionally been exposed to light. The duplicate films obtained using this method had a murky image, according to Thunthy (3), but the image was radiographically acceptable. In our application, duplicate films made with natural sunlight outperformed films made with artificial solarization significantly, but

Correspondence: Gülsün AYDOĞMUŞ, gulsumaydogmuss@gmail.com

[1] Private Practice, Istanbul, Turkiye

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even though good images were produced, the fogging was not at an "acceptable" level. As a matter of fact, in our study, relatively better results were obtained from Agfa films compared to Kodak films. Although the reason for this situation created by solarization is not yet known, the accepted view is the 'rebromination (rehalogenation) hypothesis'. According to this view, the low number of bromine that occurs in normal latent image formation has the ability to be neutralized by gelatin. The amount of bromine released during solarization cannot be broken down by gelatin. In contrast, most of the bromine settles in the spaces between the emulsion grains. When the exposure is complete, metallic silver in the latent image foci and residual bromine react and a silver bromide layer covers the latent image foci. This layer is easily isolated in the first bath solution. Thus, the grains do not react even though they have one or more latent image foci (4).

According to researchers, when films are exposed to sunlight for a prolonged period of time, the fog gradually disappears (3-5). However, the artificial solarization method's overheated ultraviolet lamp prevented the films from being exposed for longer than 10 minutes. It was believed that this brief exposure time may have contributed to the lack of radiological suitability of the duplicate films produced using this method. Our investigation led us to the conclusion that radiology clinics cannot benefit from the artificial solarization method.

Declarations

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Prevalence of Soft Tissue Calcifications in Panoramic Radiography: A Retrospective Study

Fatma Büşra DOĞAN[1], Melda Pelin AKKİTAP[1]

Abstract

Aim Soft tissue calcifications in the dentomaxillofacial region are unusual and relatively asymptomatic. They are often found incidentally on panoramic radiographs during routine examination. The aim of the present study was to evaluate the prevalence of soft tissue calcifications of the dentomaxillofacial region in panoramic radiography in relation to demographic features and localization of the jaws.
Material and method Panoramic x-ray images of 1000 patients (558 females, 442 males) aged 12-74 years were used in the study. The presence of calcified lymph node, tonsillolith, calcified atherosclerotic plaque, sialolith, phlebolith, anthrolith and styloid ligament calcification were examined. The findings were subjected to statistical analysis to examine the relationship with the gender and age parameters.
Results While the most common calcification was styloid ligament calcification (8.4%), phlebolith was never found. The most common calcification was styloid ligament calcification (8.4%), followed by tonsillolith (2.1%) and carotid plaque calcification (1.5%).
Conclusion Soft tissue calcifications are rarely seen on panoramic radiographs. However, when it is encountered, dentists should be able to identify and establish the differential diagnosis of the main soft tissue calcifications in the dentomaxillofacial region, which may be of high importance in patients' health.

Keywords Calcification, Soft tissue, Panoramic radiography, Prevalence, Radiology

Introduction

Calcification is the deposition of calcium salts in a normal body. It is important in bone formation, but calcium salts, especially calcium phosphate, can be deposited irregularly in soft tissue, causing heterotopic calcification. This accumulation causes the soft tissue to harden, and this soft tissue appears radiopaque on radiographs (1,2).

Heterotopic calcifications are divided into three subgroups as dystrophic, idiopathic and metastatic according to the mechanism of calcification, aetiology and localization (3,4). Metastatic calcifications are usually caused by the deposition of calcium and other salts in previously undamaged tissues as a result of excess salts in the circulating blood. They also occur bilaterally and symmetrically due to hypercalcemia secondary to metabolic causes or skeletal deposits of malignant disease (5-8). Idiopathic calcification, also called calcinosis, causes calcium to accumulate in normal tissues with a normal mineral balance (7). Dystrophic calcifications constitute most of the soft tissue calcifications seen in the head and neck region, and these calcifications occur in degenerative or dead tissue due to trauma, inflammation, injections, presence of parasites, and disease-related changes (5,8). Some examples of lesions with dystrophic calcification include: rhinolith, antrolith, phlebolith, tonsillolith, calcified lymph nodes, and elongated styloid ligament (6,7).

Soft tissue calcifications in the dentomaxillofacial region are unusual and relatively asymptomatic. They are often found incidentally on panoramic radiographs during routine examination of patients seeking dental care (5,7,8). However, the diagnosis of these incidental calcified lesions in oral soft tissues can be challenging, because the structures are very close to each other and it is difficult to distinguish radiopacity in bone or soft tissue due to the superimpositions (5,8-10). Interpreting radiographic representations of these calcifications accurately requires precise knowledge about their anatomical location, shape, number, pattern of distribution and approximate prevalence (11).

In this study, we aimed to evaluate the prevalence of soft tissue calcifications of the dentomaxillofacial region in panoramic radiography in relation to demographic features and localization of the jaws.

Material and Methods

In this retrospective study, panoramic radiographs of the patients who admitted to the Department of Oral and Maxillofacial Radiology in Faculty of Dentistry at Biruni University were analysed for the detection of soft tissue calcifications. The design of this retrospective study was reviewed and approved by the Research Ethics Committee of Biruni University Faculty of Dentistry (2023/80-21).

Panoramic x-ray images of 1000 patients (558 females, 442 males) aged 12-74 years were evaluated in the study. Radiographic images with poor image quality, large pathological lesions, maxillofacial surgery and images not including the area to be examined were excluded from the analysis. High quality images with a clear view of the area to be examined were included in the study.

Correspondence: Fatma Büşra DOĞAN, fdogan@biruni.edu.tr

[1]Biruni University, Faculty of Dentistry, Department of Dentomaxillofacial Radiology, Istanbul, Turkiye

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Table 1: Description of the radiographic appearances and location of soft tissue calcifications (3)

Diagnosis	Location	Radiographic appearance
Calcified lymph node	The submandibular region, below the inferior border of the mandible near the angle	Irregular radioopacities, lobulated appearance similar to the outer shape of cauliflower
Tonsillolith	Midramus region where the image of the dorsal surface of the tongue crosses the ramus in the oropharyngeal air spaces	Round single or multiple, small, ill-defined radiopacities
Calcified atherosclerotic plaque	Posteroinferior to the mandibular angle, adjacent to the cervical vertebrae C3, C4, or the intervertebral space of them	Circular when small and vertical linear oriented when enlarged, irregular, heterogeneous radiopacities
Sialolith	Submandibular sialolith; below the border of the mandible close to the region of the ramus	Unilateral and diffusely calcified radiopacities with regular contours
Phlebolith	Common region; posterior body of the mandible	Multiple, small,mixed radiolucent-radiopaque, targetoid appearance
Anthrolith	In the antrum of the maxillary sinus	Single, well-defined, smooth, or irregular radiopacity
Styloid ligament calcification	The styloid process measures >30 mm from the lower border of the external auditory to the hyoid bone.	Long, tapering, thin, radiopaque process that is thicker at its base and lies downward and forward

The presence of calcified lymph node, tonsillolith, calcified atherosclerotic plaque, sialolith, phlebolith, anthrolith and styloid ligament calcification were examined. The evaluation criteria of radiopacities, which have their own characteristics in terms of their radiographic appearance and localization, are shown in Table 1.

All images were examined by two Oral and Maxillofacial Radiology specialist (FBD & MPA), and the evaluations were completed by consensus on different results. The findings were subjected to statistical analysis to examine the relationship with gender and age parameters.

Statistical Analysis

All analysis were performed using IBM SPSS 25 program. In the study, descriptive statistics (number and percentage) of the data are given in Table 2. Pearson Chi-Square test and Fisher&Exact tests were applied to test the relationship between the categorical variables.

Results

Calcifications found in this study include calcifications of the styloid ligament, lymph node, calcified atherosclerotic plaque, sialolith, tonsillolith, and antrolith (Figure 1). The distribution of our findings is demonstrated in Table 2. When the descriptive statistics for the demographic characteristics of the images used in the study were examined, 613 were in individuals under 40 years old (61.3%) and 387 in individuals over 40 years old (38.7%). There were 558 females (55.8%) and 442 males (44.2%).

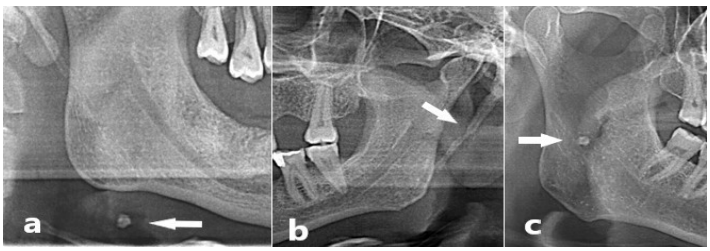

Figure 1: a) Lymph node calcification, b) Styloid ligament calcification, c) Sialolith

The most common calcifications were respectively styloid ligament calcification (8.4%), tonsillolith (2.1%) and calcified atherosclerotic plaque (1.5%). However, there were no radiopacities in the sample which suggested a phlebolith. Of the 1000 radiographs examined for evidence of soft tissue calcifications and a total of 201 calcifications (20.1%) were identified in 135 individuals, of which 77 were female (55.8%) and 68 were male (44.2%). Although the prevalence of calcifications in females was much higher than that in males, no statistical difference was found between them in all calcification types (p>0,05) (Table 2).

Table 2: Distribution of calcifications by gender of individuals

	Female (n, %)		Male (n, %)		Total (%, p)	
Tonsillolith	9	1,6	12	2,7	2,1	0.225
Calcified atherosclerotic plaque	9	1,6	6	1,4	1,5	0.741
Calcified lymph node	2	0,4	5	1,1	0,7	0.251
Sialolith	1	0,2	5	1,1	0,6	0.093
Anthrolith	2	0,4	0	0	0,2	0.506
Styloid ligament calcification	54	9,7	30	6,8	8,4	0.102

Pearson Chi-Square test and Fisher&Exact tests, (p<0,005)

When the presence of soft tissue calcification was analysed according to the groups under 40 years of age and over 40 years of age, a statistically significant link was found between being over age 40 with tonsillolith, calcified lymph node and calcified atherosclerotic plaque (p<0.001, p<0.015, and p<0.006, respectively). In terms of age, there were significant differences between the presence of these calcifications and an increase in age (Table 3).

Table 3: Distribution of calcifications by age of individuals

	<40 (n,%)		>40 (n,%)		p
Calcified lymph node	1	0,2	6	1,6	0.015
Anthrolith	0	0	2	0,5	0.150
Calcified atherosclerotic plaque	4	0,7	11	2,8	0.006
Tonsillolith	5	0,8	16	4,1	0.001
Styloid ligament calcification	48	7,8	36	9,3	0.414
Sialolith	4	0,7	2	0,5	0.454

Pearson Chi-Square test and Fisher&Exact tests, (p<0,005)

Discussion

Soft tissue calcifications are mostly asymptomatic, so they are detected incidentally during routine radiological examination. In addition, the detection and diagnosis of these calcifications can be difficult in cases of superposition caused by the two-dimensionality of panoramic radiographs (8). Nevertheless, the specific localizations and radiological appearances of the calcification types were considered as a reference in our study when investigating.

Previous studies showed the prevalence of soft tissue calcifications identifiable on panoramic radiographs between 2.61% and 8% (5,7,12). In the present study, a higher prevalence of 20.1% was observed similar to study conducted by Riberio et al. (19.7%) (10). The reason of high difference for our study and the study of Ribeiro et al. may be the inclusion of styloid ligament calcifications (10).

The highly prevalent soft tissue calcification in the current study was styloid ligament calcifications (%8.4), followed by tonsillolith (%2.1), carotid artery plaque (1.5%), calcified lymph node (0.7%), sialolith (0.6%), antrolith (0.2%) respectively. However, Ramadurai & Umamaheswar reported that the highly prevalent soft tissue calcification was sialolith (30.43%) followed by atherosclerotic plaque (17.39%), while Icoz & Akgunlu reported that the most observed calcification type was tonsilloliths (38.9%) (7,8). According to the study of Sutter et al., it was revealed that of 1042 patients, whose panoramic radiographs were evaluated, 5.7% had tonsilloliths, 0.9% had sialoliths, 5.7% had carotid artery plaques, 3.6% had calcified lymph node (13). Akin to our study, there has been no incidence of phleboliths in almost all of the previous studies (14), but only Ramadurai et al. reported a prevalence of 17.39% of phleboliths (7).

Our study results showed no significant difference in the presence of calcifications between both genders, whereas most of the studies in the literature showed a significant relationship between genders and the prevalence of the calcifications within soft tissue, which is found a greater prevalence in men (15) or women (7,11,12). Moreover, the majority of calcifications, especially for calcified lymph node, carotid artery plaque and tonsillolith, were more common in ages over 40 years in this study. Similarly, some authors stated that the prevalence of these calcifications increases with age (7,11,16). In general, controversy in the results of different epidemiologic studies can be due to the fact that the number of panoramic radiographs evaluated in the majority of the aforementioned studies was lower than that in our study.

In our study, calcification of the styloid complex was the most prevalent (%8.4), differing from other radiographic studies found in the literature, where prevalence rates range from 3.7% to 52.1%, (10,17-19). High variability in its prevalence rate can be due to anatomical and racial variations, nutritional habits, lifestyle, muscle tension due to occlusal interferences and different study populations and variability among the observers. Moreover, previous authors, similar to ours, reported the same prevalence rates in males and females (11,20). A higher prevalence of calcification of this complex in patients aged 40 years and older in agreement with the results previously reported (21), whereas, some researchers reported a higher prevalence in younger than 40 years old (11,22).

According to the present study's results, the second most observed calcification type was tonsillolith with the percentage of 2.1% of all study samples. A similar percentage (0.9%) was reported by Riberio et al. (10). On the other hand, also including only panoramic images, Bamgbose et al. and Maia et al. found a percentage of tonsilloliths of 8.14% and 9.1% respectively (9,23).

In this current study, apart from the styloid ligament calcification and tonsillolith, another calcifications that are mostly observed are carotid artery plaque, followed by calcified lymph node, sialolithiasis, and antrolith respectively. The prevalence of carotid artery calcifications was 1.5% in our study compared to the study done by Riberio et al. (5.1%) (10). According to the results of the same study, the prevalence rate of sialolith was reported as 0.5%, and this result is in consistency with the present study (0.6%) (10). El Deeb et al. also reported that sialoliths affect the 0.01%–1% of the population and according to Garay et al., it is 0.3% (15,24). Moreover, the prevalence of the calcified lymph node was detected in 0.7% of the evaluated images, and this result is slightly higher than the study of Vengalath et al. which is 0.12% (5). In the literature, lymph node calcification of the head and neck region is reported as 1% of enlarged nodes, which is consistent with our results (5,8). In our study, only two antroliths were visualised (0.1%) and Riberio et al., found that only one patient (0.1%) had antrolith (10).

Conclusion

Soft tissue calcifications in orofacial area are fairly unusual and they are usually incidentally detected on routine radiographic examination. It is noteworthy that soft tissue calcification especially in the cervical region could happen due to physiologic process and as a result of wide range of pathologies. For this reason, dentists and maxillofacial radiologists should be alert to these calcifications during the routine dental examinations.

The remarkable point in our study was that the incidence of calcification increased with advanced age. While the most common calcifications were respectively styloid ligament calcification, tonsillolith and calcified lymph node. Phlebolith was not found in our study.

Declarations

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Aesthetic Rehabilitation of the Anterior Region in the Presence of Class III Lesions and Diastema

Oyun Erdene BATGEREL[1], Musa Kazım ÜÇÜNCÜ[2], Oktay YAZICIOĞLU[3]

ABSTRACT

Aim The purpose of this case report is to restore the aesthetic and functional inadequacy of anterior teeth with diastema and class III cavity.

Case Report The patient with diastema and class III caries lesions in the anterior region was to receive esthetic rehabilitation with direct composite restoration material in a single visit. After color-matching, isolation was obtained by using a rubber-dam. Nanofil-based composite material was applied in accordance with the manufacturer's instructions following the usage of two-step self-etch adhesive system. After finishing and polishing, the restorations were finalized. One month later, the patient was called for a control session, and the restorations were evaluated using the USPHS procedure.

Conclusion To achieve effective results in the creation of direct composite restorations that are done in a single visit, it is vital to match the appropriate color, use the proper method, isolate the environment, and have clinical experience.

Keywords Aesthetic rehabilitation, Class III lesions, Dental composite, Diastema, Restorative dentistry

Introduction

Diastema, which refers to the space between two teeth, can occur for a variety of reasons and is common in the front part of the upper jaw (1). Diastemas with several causes, such as size anomalies, congenital tooth loss, atypical swallowing, and hypertrophy of the labial frenulum, can be treated with minimally invasive techniques (2). Class III caries lesions are classified as lesions that develop on the proximal surfaces of the anterior teeth and do not include the cutting edge (3). The composite and indirect restorative materials can be used to treat dental caries with this cavity pattern (4).

Due to the importance of aesthetics in human life, the number of people seeking dental treatment has significantly increased. With this increase, minimal invasive treatment approaches, based on the premise of minimal tissue damage and maximum benefit, have become increasingly widespread (5). In addition, the growth of cosmetic clinical treatments and the increase in patient expectations have led to the emergence of new dental materials (6).

In this case report, a one-shade restorative material is used to restore diastema and class III caries lesions in the anterior region in a single visit.

Correspondence: Musa Kazım ÜÇÜNCÜ, ucuncumusakazim@gmail.com

[1] Private Practice,Istanbul, Turkiye

[2] Altınbaş University, Faculty of Dentistry, Department of Restorative Dentistry, Istanbul, Turkiye

[3] Istanbul University, Faculty of Dentistry, Department of Restorative Dentistry, Istanbul, Turkiye

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Case Report

A 37-year-old male patient with cosmetic issues in the anterior region sought treatment at the restorative dental clinic (Figure 1). According to the anamnesis, there was no evidence of a systemic illness. The intraoral and radiographic examination revealed diastema in the anterior region and caries lesions of class III type on teeth #12, #11, #21, and #22 (Figure 2-3). The patient was informed of alternative treatments. In accordance with the patient's approval, it was determined that direct composite restorations would be applied in a single visit because it was the least invasive, quick, and cost-effective. The button technique was utilized to determine the color, and the restorative material selected (3M ESPE Filtek™ Ultimate A2 Body, ABD). Following color-matching, rubber-dam was applied, and the processes of preparing cavities and beveling were completed (Figure 4). After applying 37% orthophosphoric acid on the enamel surfaces, washing and drying procedures were carried out. Two-step self-etch adhesive (Clearfil SE Bond, Kuraray Europe, Germany) was applied according to the manufacturer's instructions. Nanofil-based composite was utilized as a restorative material. The polymerization procedure was performed using a high-performance LED light unit (3M ESPE Elipar S10). When treating diastemas using a specialized anterior matrix system, the gingival emergence profile was restored to its anatomical state. In the final step of layering, glycerine gel was used prior to polymerization to prevent the formation of an oxygen inhibition layer.

Polishing discs (3M ESPE Sof-Lex™, USA) and spiral polishing materials with two different grain structures (Twist Dia, Kuraray, Japan) were used in combination for finishing and polishing (Figure 5). For the approximate areas, the interdantal strips of varying grain sizes were used from coarsest to finest. The image was captured immediately following the polishing process (Figure 6).

Figure 1: Initial

Figure 2: The application of rubber-dam & isolation from vestibul side

Figure 3: The application of rubber-dam & isolation from palatinal side

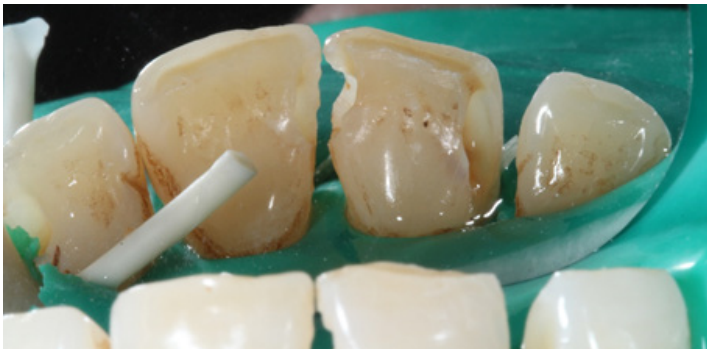

Figure 4: The stage of cavity preparation

Figure 5: The stage of finishing operations with the coarsest grain finishing disc

1 month later, an oral and radiological assessment of the patient was undertaken. According to United States Public Health Service (USPHS) guidelines, the restorations were measured. All restored teeth were assessed as "Alpha" for restoration, marginal integrity, anatomical form, secondary caries, surface texture, shade match, marginal discoloration and postoperative sensitivity (Figure 7).

Discussion

The long-term success of direct composite restorations in the treatment of class III deformations is due to the patient's cooperation with the physician and high oral motivation. The long-term success is also associated with the correct indication and material selection (7). Midline diastema is a non-carious lesion that can be found at a much higher rate in the maxilla than in the mandible and harms the aesthetic (8). The size and quantification of the gap play a key role in diastemas that can be treated with orthodontic or restorative methods (9).

Figure 6: After the finishing & polishing

Figure 7: 1 month recall

By actually analyzing social and economic expectations and treatment needs, it is possible to select the suitable diagnostic and treatment technique. This ensures the success of the therapy and the durability of the restorations (7). Because direct composite restorative materials are generally characterized as cheaper, more minimally invasive, easy to apply, and repairable than indirect veneers (6). Since the optical (color stability) and physical properties of the direct composites have improved (10), the treatment method with

direct composite restorative material in a single visit was preferred in this study. In direct composite restoration, restorative procedures can be performed in a short time with one-shaded composite materials and errors in color-matching are minimized. Since it is claimed that the optical behavior of one-shaded restorative materials is not similar to that of traditional group-shaded composites (11), one of the group-shaded composite types was used in this study. Given the fact that one-shade composites have significant translucency owing to their structure, they cannot be utilized effectively in cases with high aesthetic demands, such as diastema, due to the dark background effect of the oral cavity. In such cases, "opaque" should be applied according to the manufacturer's instructions prior to application of the one-shaded composite (12).

During diastema closure, in addition to occlusal relations, the dental midline and esthetic proportion of each tooth must be examined (13). All of these goals may be attained using, metal-ceramic restorations, all-ceramic crowns, porcelain laminate veneers, and resin-based composite materials. Porcelain laminate veneers are distinguished by their durability and color uniformity (14). Specifically, their color, form, surface, and individual characterization, as well as the fact that these restorations may be further color-corrected during cementation using distinct cement colors, make them an attractive but expensive treatment option (15,16). For the following reasons, the direct esthetic bonding with resin-based composites may be the most conservative method for achieving this objective: the sound tooth structure is prevented, the treatment requires no local anesthesia, the treatment can be completed in a single visit, in a matter of hours, and it is comparatively affordable (17). Also, the direct esthetic bonding technique allows full authority of each restorative phase in the chair side (17). Free-hand direct resin-based composite build-ups can be hard for a clinician to do. Therefore, this method could facilitate a beneficial therapeutic outcome (18).

Nanofil-based composites are the most aesthetically pleasing and appropriate restorative materials. A microhybrid composite is more susceptible to color change and opacity loss than nanofillers (19). It is also observed that the nanofil composites show superior performance in bond strength studies (20,21). In the light of this information, a nanofil-based composite material was selected in this case report.

The limitation of this study is the need for longer follow-up, apart from the 1-month recall period. With the nanofil-based composite, high-quality restorations can produce favorable outcomes. In instances where a non-invasive clinical approach is not indicated, direct composite restorations offer a near-ideal therapeutic alternative for the cosmetic rehabilitation of anterior teeth.

Declarations

Author Contributions: *Conception/Design of Study- O.E.B., M.K.Ü.; Data Acquisition- O.E.B., M.K.Ü.; Data Analysis/Interpretation- O.E.B., M.K.Ü.; Drafting Manuscript- O.E.B., M.K.Ü.; Critical Revision of Manuscript- O.Y.; Final Approval and Accountability- O.Y.; Material and Technical Support- O.Y.; Supervision- O.Y.*

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Case Report: Treatment of Major Aphthous Lesions of Behçet's Disease with Immunomodulatory Effects of Low-Dose Antibiotic Treatment

Arda ÖZGÖN[1], Meltem KORAY[2]

ABSTRACT

Aim Behçet's disease (BD) is a multisystemic inflammatory disease. The most common symptoms are recurrent major aphthous lesions in mouth. It is the initial symptom in most (about 80%) of the cases. It is very crucial to treat oral symptoms in order to minimize oral discomfort caused by inflammatory lesions in BD patients. The aim of this case report is to ameliorate the oral symptoms of BD by using the immunomodulatory effects of antibiotics.
Case Report We present treatment of BD's oral symptoms by using the immunomodulatory effects of antibiotics. A 30-year-old patient presented to our clinic with 2 major aphthae and discomfort in eating. The patient was treated with low-dose azithromycin for 3 weeks.
Discussion The low-dose antibiotic therapy is a proven treatment modality for relieving oral symptoms of BD. Low-dose azithromycin was successful in relieving the oral symptoms of BD within 3 weeks. In the treatment of advanced aphthous lesions, the completion of the healing in 3 weeks of treatment and the absence of recurrence of aphthous lesions in 2 months proves the success of the treatment.
Conclusion One week after starting the treatment, improvement was observed in the lesions. After 3 weeks of treatment, the aphthous lesions were completely healed. It was observed that oral symptoms did not return at the end of the 2-month treatment follow-up. Although azithromycin is used in the treatment of aphthous lesions caused by BD, more research is needed in this area.

Keywords Antibiotic, Azithromycin, Behçet's disease, Low-dose antibiotic treatment, Surgery

Introduction

In 1937, a Turkish dermatologist by the name of Hulusi Behcet formally described two patients with the 'triple symptom complex' of recurrent oral ulcerations, genital ulcers and hypopyon (1). It is a multisystemic inflammatory disease. The most common symptoms are recurrent major aphthous lesions in mouth. It is the initial symptom in most (about 80%) of the cases (2). Behçet's disease (BD) is more prevalent in the World in the region of so-called "Silk Road", including Turkey, Iran, Korea, China, Saudi Arabia, and Japan (3) and more common among men aged 20 to 40 years (3). The disease is characterized by a chronic course of relapses that include oral aphthous ulcers, genital ulcers, arthritis, cutaneous, gastrointestinal, and neurologic lesions (4). The most common symptoms of BD are genital and oral ulcers, which are usually the initial manifestations (5).

The management of a patient with BD is complex and oftentimes requires a multidisciplinary approach. While the care of any patient should be individualized, implementation of, and adherence to general guidelines should be considered (6). As the clinical expression of BD is quite heterogeneous, pharmacological therapy is variable and depends largely on the severity of the disease and organ involvement (6). Targets of BD treatment are remission of the active disease, suppression of exacerbations and permanent disabilities in mucous membranes, skin, eye and joints, and enhancement of life quality (7). Oral corticosteroids, immunosuppressive drugs, colchicine, dapsone, azathiyoprin, cyclosporine, apremilast and thalidomide are the drugs that clinicians use to eradicate oral symptoms. However, these drugs have adverse effects and a safer option is required (8-9).

Azithromycin is a type of medicine that fights against bacterial infections. It belongs to a group of medicines called macrolide antibiotics. These medicines have a special ring structure that can attach to the bacteria's ribosomes and stop them from multiplying. Macrolides are made from natural substances and were discovered a long time ago. Erythromycin was the first one found and it was used when people couldn't take penicillin. Azithromycin is a newer medicine that was designed to work better and have fewer side-effects. It can fight against many kinds of bacteria (10).

Azithromycin is a macrolide antibiotic that demonstrates bacteriostatic activity against many gram-positive and gram-negative bacteria as well as atypical agents. It reduces bacterial virulence by inhibition of biofilm formation, bacterial protein synthesis and release of pathogen-associated molecular patterns from bacteria, and also by enhancement of phagocytosis and intracellular killing of bacteria by monocytes (8). Additionally, azithromycin possesses immunomodulatory properties through inhibition of several pro-inflammatory cytokines and chemokines, attenuating the migration of effector cells to the airways (11). Macrolides, including azithromycin, have been shown to inhibit Akt phosphorylation, indicating their ability to modulate cortico-

Correspondence: Arda ÖZGÖN, ardaozgon@gmail.com

[1] Institute of Health Sciences, İstanbul University, Istanbul, Turkiye

[2] Istanbul University, Faculty of Dentistry, Department of Oral and Maxillofacial Surgery, Istanbul, Turkiye

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steroid resistance mechanisms (12).

Case Report

A 30-year-old female patient diagnosed with BD applied to the Department of Oral, Dental and Maxillofacial Surgery of Istanbul University Faculty of Dentistry with complaints of pain caused by major aphthae in her mouth and discomfort in eating. In the clinical examination, one major aphthae was detected on the right side of the lower lip near the commissure (Figure 1) and on the left tip of the tongue (Figure 2). For the treatment of major aphthae using the proven immunomodulatory effect of azithromycin, the patient was prescribed 500mg azithromycin once daily on Mondays, Wednesdays and Saturdays of the week. The patient was called for follow-ups at the end of the first week and the third week. In the 1st week follow-up, it was observed that the major aphthae started to heal. (Figure 3) After 3 weeks of treatment patient has showed improvement in both major aphthae. (Figure 4) At the follow-up 2 months later, it was observed that the patient's aphthae were completely healed and no side effects were observed against azithromycin. Although azithromycin is used in the treatment of aphthous lesions caused by BD, more research is needed in this area.

Discussion

The immunomodulatory effects of antibiotics mean that they can be used to treat infections as well as inflammation and other conditions that affect the immune system (13).

The immunomodulatory effects of antibiotics depend on many mechanisms. These include:

1. Killing bacteria: Antibiotics treat the infection directly by killing the infecting bacteria. Killing bacteria can strengthen the immune system by reducing the burden of infection that overloads the immune system (14).
2. Reducing inflammation: Antibiotics modulate the inflammatory response of the immune system by reducing the inflammation of infected tissues. This, in turn, can help treat chronic inflammatory diseases (13).
3. Changing the gut microbiota: By changing the gut microbiota, antibiotics can affect the rate and types of bacterial populations in the gut. This may produce immunomodulatory effects on the intestinal immune system (15-16).
4. Effect of immunoregulatory cells: Antibiotics can regulate the immune system response by increasing or suppressing the activation of immune regulatory cells. For example, T-regulatory cells provide immunomodulation by increasing immune tolerance and

Figure 1: First day examination. Major aphthae on lip.

Figure 3: 1-week follow-up. Major aphthae started to heal.

Figure 2: First day examination. Major aphthae on tongue.

Figure 4: 3-week follow-up. Major aphthae healing almost completed.

reducing autoimmune responses (17).

The immunomodulatory effects of antibiotics still remain the subject of research, and the exact mechanisms of these effects are not fully understood (13).

Azithromycin therapy in BD Research on the use of azithromycin in the treatment of oral symptoms of BD is still limited. However, there is some evidence that azithromycin is effective in improving the oral symptoms of BD. In one study, BD patients were given azithromycin 500 mg/day and followed for 4 weeks. At the end of the study, the number of oral aphthae of the patients decreased and the healing processes were accelerated (18).

The use of azithromycin for the treatment of oral symptoms of BD has fewer side effects than other BD treatments (18). However, long-term use of azithromycin may lead to the development of antibiotic resistance. Therefore, the duration and dose of azithromycin therapy should be determined according to the patient's symptoms and condition. In addition, the side effects of the use of azithromycin should be considered.

It is important to choose an appropriate treatment protocol for the treatment of the oral symptoms of BD. Azithromycin is a safe and effective option for the treatment of oral symptoms of BD. Although the side effects of azithromycin therapy are few, its long-term use can lead to the development of antibiotic resistance. As a result, the duration and dose of azithromycin therapy should be determined according to the patient's symptoms and condition. In our patient, treatment with 500mg azithromycin once a day on Mondays, Wednesdays and Saturdays of the week resulted in complete resolution of major aphthae with oral symptoms of BD in 3 weeks. Further research will help us to understand more clearly the role of azithromycin in the treatment of BD.

Declarations

Author Contributions: *Conception/Design of Study- M.K., A.O.; Data Acquisition- A.O.; Data Analysis/Interpretation- A.O.; Drafting Manuscript- M.K., A.O..; Critical Revision of Manuscript- M.K.; Final Approval and Accountability- M.K.; Material and Technical Support- M.K., A.O.; Supervision- M.K.*

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Hyperdontia: Case Report

Oyun Erdene BATGEREL[1], Emine KITIN[2], Merve YELKEN KENDİRCİ[3], Raghib SURADI[4], Therka SARDI[5]

ABSTRACT

Aim The purpose of this case report is to explain that the patiens with hyperdontia need regular follow-up and that the necessary treatments should be done gradually.

Case Report Our patient, who applied to the Oral Diagnosis and Radiology Clinic of Biruni University Faculty of Dentistry, was diagnosed with hyperdontia as a result of radiological examination. At the same time, 4 primary premolar teeth and 4 paramolar teeth were seen in the maxilla and mandible. According to the family history, it was learned that this situation had not been seen before in the family's history.

Conclusion We suggest that routine check-ups at regular intervals, after necessary treatments have been performed for patients diagnosed with hyperdontia, are crucial for preserving permanent teeth.

Keywords Dental anomalies, Dentistry, Hyperdontia, Primary teeth, Radiographic controls

Introduction

Hyperdontia is the occurrence of having more teeth than normal in an individual. Anomalies in tooth count, or in other words, having fewer or more teeth than normal, arise from abnormalities in proliferation events during tooth formation. Proliferation events can deviate from normal for two reasons. The first reason is defects in genes that give species-specific genetic information to continue cell proliferation at specific points on the dental lamina during development (1). This type of disorder shows that familial traits are involved in the etiology of numerical anomalies. The genetic or chromosomal anomaly is passed on as autosomal recessive and there is a hereditary predisposition to numerical anomalies (1). The second reason deviating proliferation from normal is the various damages that can occur during proliferation, such as mechanical, traumatic and chemical damages as well as ionizing radiation, and infections. All of these reasons can cause deviations from normal proliferation points on the dental lamina, resulting in hyperdontia or hypodontia, and rarely anodontia (2).

In addition to these, hyperdontia can also occur in some anomalies that involve the entire body. Researchers agree that the folding of the dental lamina can result in the development of supernumerary teeth when cleft lip-palate occurs. Additionally, hyperdontia can be seen in Cleidocranial Dysostosis, Oro-digito-facial Dysostosis, Gardner syndrome, and Hellermann-Streiff syndrome (3-5). Other related rare genetic syndromes are Fabry disease, Ellis-van Creveld syndrome, Trico–Rhino–Phalangeal syndrome, Rubinstein-Taybi Syndrome and Nance-Horan syndrome (6).

The excess number of teeth is called "supernumerary teeth". Sometimes they form anomalies in the shape of cones or stumps. They are generally small in size. However, mesiodens are always conical. If the extra tooth exactly mimics the morphology of the tooth group it is found in, it is called a "supplemental tooth". Hypoplasia is rare in these type of teeth (7).

The supernumerary teeth usually do not erupt and their presence is detected either by symptoms or radiographic examination. The ratio of erupted supernumerary teeth to impacted supernumerary teeth is approximately 5:1 (5). Hyperdontia is more common in the lower jaw. The excess number of teeth in deciduous dentition is a rare condition (6-8).

The eruption time of supernumerary teeth is the same as that of normal teeth. These teeth usually erupt ectopically. Supernumerary teeth often appear unilaterally. Rarely, they can appear symmetrically. Mesiodens is the most common type of supernumerary teeth. Then, the upper fourth molars and lower small molars follow in order. In deciduous dentition, supernumerary teeth most commonly occur in incisors. They rarely appear in deciduous canines (9).

It is very rare for supernumerary teeth to be present in both the deciduous and permanent dentitions of the same individual. They can remain not erupted with permanent teeth, cause dental crowding, and sometimes prevent the eruption of permanent teeth. If they remain impacted, they can cause displacement and root resorption of teeth. Supernumerary deciduous teeth can cause delayed development or vestibuloversion of normal deciduous teeth (10).

In this article, findings related to a case of hyperdontia that is interesting due to its occurrence in both the deciduous and permanent dentitions and its symmetrical presentation in the deciduous dentition will be presented.

Correspondence: Oyun Erdene BATGEREL, oyuk1207@yahoo.com

[1] Private Practice,Istanbul, Turkiye

[2] Istanbul University, Faculty of Dentistry, Department of Restorative Dentistry, Istanbul, Turkiye

[3] Biruni University, Faculty of Dentistry, Department of Dentomaxillofacial Radiology, Istanbul, Turkiye

[4] Biruni University, Faculty of Dentistry, Department of Restorative Dentistry, Istanbul, Turkiye

[5] Başkent University, Faculty of Medicine, Department of Anatomy, Ankara, Turkiye

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Case Report

The patient is a 19-year-old girl who applied to our Department of Oral Diagnosis and Radiology for treatment of decayed teeth.

According to the patient's medical history, no characteristics were found in her medical history. Further examination of the patient's father and two siblings revealed no similar condition. The patient's mother, although young, wears complete upper and lower dentures. Both the mother and father stated that they had not encountered such a condition in their families before. After radiological examination of orthopantomographs of the patient, a permanent four permolar and paramolar tooth was detected in the maxilla and mandible. (Figure I).

Figure 1: Permanent supernumerary teeth seen on panoramic radiograph.

Discussion

Hyperdontia is the condition of having more teeth than the normal number in an individual. It is suggested that there is a familial predisposition to hyperdontia and it is inherited as an autosomal recessive trait (2). In our case, hyperdontia was observed for the first time in the family. Therefore, it can be considered that a recessive character played a role in the emergence of hyperdontia. There is no anomaly or cleft lip/palate affecting the body in our case.

Hyperdontia is slightly more common in males (1). Our case is a 19-year-old female. There are two permanent premolars and two permanent paramolars on the upper and lower jaw. The incidence of hyperdontia in the upper jaw is eight times more frequent than in the lower jaw. In our case, supernumerary teeth are also located in the upper jaw. Supernumerary teeth usually cannot erupt (8). When supernumerary teeth erupt, they usually erupt along with normal teeth and are often ectopic. However, in our case, supernumerary permanent teeth in both the upper and lower jaws erupted next to the normal permanent teeth and took their place in the dental arch without being ectopic. As for the supernumerary permanent tooth, since it has not erupted yet, it is unknown what effect it will have on the dental arch in the future (2).

Supernumerary teeth are most commonly found between the central incisors, followed by the upper fourth molars and lower premolars (1, 2, 10, 11). In our case, supernumerary teeth were found in the upper and lower premolars and upper and lower paramolars of the permanent dentition. In our case, there were supernumerary teeth in the upper and lower permanent teeth.

Conclusion

We suggest that routine check-ups at regular intervals, after necessary treatments have been performed for patients diagnosed with hyperdontia, are crucial for preserving permanent teeth.

Declarations

Author Contributions: *Conception/Design of Study- O.E.B.; Data Acquisition- M.Y.K.; Data Analysis/Interpretation- E.K.; Drafting Manuscript- R.S., T.S.; Critical Revision of Manuscript- O.E.B.; Final Approval and Accountability- O.E.B.; Material and Technical Support- O.E.B.; Supervision- O.E.B.*

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