

# Morphological Anomalies of Bilateral Mesiodens: Case Report

## Bilateral Mesiodenslerin Morfolojik Anomalileri

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**ABSTRACT** Mesiodens is the most frequently seen supernumerary tooth in the anterior midline of the maxilla. Talon cusp is a rare morphological dental anomaly that project from the cemento-enamel junction of the labial or lingual surface of the maxillary or mandibular anterior teeth. This accessory cusp usually occurs as an isolated entity. The occurrence of these two entities together is very rare phenomena. This case report presents a clinical case of bilateral mesiodens, one of which was rarely seen type with a talon cusp and other as a tuberculate type, which resembled a geminated tooth with multi cusps. Furthermore this report determines the three-dimensional images of teeth and treatment procedures.

**Key Words:** Tooth abnormalities; tooth, supernumerary

**ÖZET** Mesiodens, maksilla ön orta hatta yer alan, en sık görülen süpernümere dişdir. Talon tüberkülü, maksiller veya mandibular ön dişlerin labial ya da lingual yüzeylerinin sement-mine birleşiminden çıkıntı şeklinde uzanan nadir bir morfolojik dental anomalidir. Bu aksesuar tüberkül genellikle tek olarak görülür. Bu iki oluşumun birlikte görülmesi çok nadirdir. Bu vaka raporunda, biri oldukça nadir görülen talon tüberkülü ve diğeri gemine bir dişi andıran çok tüberküllü bir vaka olan bilateral mesiodensler sunulacaktır. Ayrıca dişlerin üç boyutlu görüntüleri ve tedavi prosedürleri değerlendirilecektir.

**Anahtar Kelimeler:** Diş anomalileri; diş, süpernümere

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Supernumerary tooth in the anterior midline of the maxilla or mandible is known as mesiodens. Mesiodens, which is the most common type of the supernumerary teeth, is seen in the various prevalence ratios from 0.15% to 7.8%.<sup>1,2</sup> Mesiodens is seen more frequently in men than in women.<sup>3</sup> They may be seen unilaterally or bilaterally. Bilateral mesiodens make 13% of all of the mesiodens cases.<sup>4</sup>

According to their morphology, types of mesiodens can be classified as rudimentary (dysmorphic) and supplemental. Mesiodens which is classified as rudimentary or dysmorphic type may have a conic, tuberculate or molariform shape and supplemental type have a normal morphology.<sup>5</sup> Sometimes, they may be associated with other dental anomalies like dens invaginatus, fusion and talon cusps.<sup>5-7</sup> For that reason a detailed clinical and

radiographic examination is important for definite diagnosis when such anomalies coexist within a tooth.

Talon cusp is a morphological dental anomaly, which can be defined as cusp-like structures projecting from the cemento-enamel junction of the labial or lingual surface of the maxillary or mandibular anterior teeth. The cusp consists of normal enamel and dentin and may have a pulp tissue.<sup>8</sup> The most affected teeth are maxillary anterior teeth and there is a male predilection for talon cusp.<sup>9</sup> This accessory cusp usually occurs as an isolated entity but rarely occur in association with mesiodens. In the literature, few case reports of talon cusp on mesiodens had been reported.<sup>7,10,11</sup>

The aim of this case report is to determine the radiographic features with cone beam computed tomography (CBCT) and treatment procedures of bilateral mesiodens, one of which has a talon cusp and other is a tuberculate type which resembled a geminated tooth with multiple cusps.

## CASE REPORT

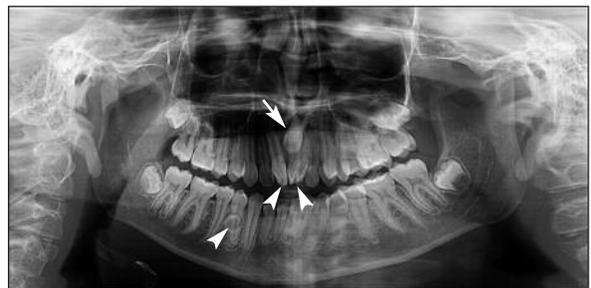
A 13-year old girl was referred to our clinic with the complaint of aesthetic problems of her anterior teeth. On clinical examination, a labially displaced right maxillary central incisor was determined and at the region of left maxillary central incisor there was a tooth with atypical crown morphology (Figure 1). She did not have any syndromes and relevant family history. To gain further information, panoramic radiograph was made.

On the panoramic radiograph, an impacted left maxillary central incisor was detected. There was also another supernumerary follicle of third premolar at the right mandible (Figure 2). Clinical and radiographic examination showed that there were two erupted supernumerary mesiodens teeth in the anterior maxilla. Mesiodens at the right side had a talon cusp on its palatal surface, and mesiodens at the left side, had atypical crown morphology.

She was consulted with orthodontist and considered to make a CBCT examination to gain further information about the exact location of the impacted central, the relationship with the



**FIGURE 1:** Photographs of the patient **a-** Mesiodens cause of the aesthetic problem of the patient. **b-** Labially displaced right maxillary central incisor and at the area of left maxillary central incisor mesiodens with atypical crown morphology on occlusal mirror image of upper dental arch.



**FIGURE 2:** Impacted left maxillary central incisor, two erupted supernumerary mesiodens teeth and supernumerary follicle at the right mandible on the cropped panoramic radiograph.

neighboringhood teeth and probable root resorption.

After her parents signed an informed consent form recording their agreement, the patient was scanned using a New Tom 5G CBCT system (Verona, Italy) with 8x8 cm FOV (field of view) in patient scan mode. The volumetric data from the CBCT system was reconstructed and sectioned into

0.125 mm pieces in the axial plane and 1 mm pieces in the coronal plane and three-dimensional images were reconstructed.

Examination of CBCT images scan showed that the impacted left central incisor did not cause resorption on the adjacent teeth. The cingulum of the right maxillary first incisor had a contact with the right mesiodens, which had a talon cusp. Root formation of right mesiodens had not been completed. Mesiodens in the area of the left maxillary central incisor had an unusual crown and root morphology. The left mesiodens resembled a geminated tooth with multiple cusps and large crown and a large root with a large canal. Formation of the root was incomplete (Figures 3-5).

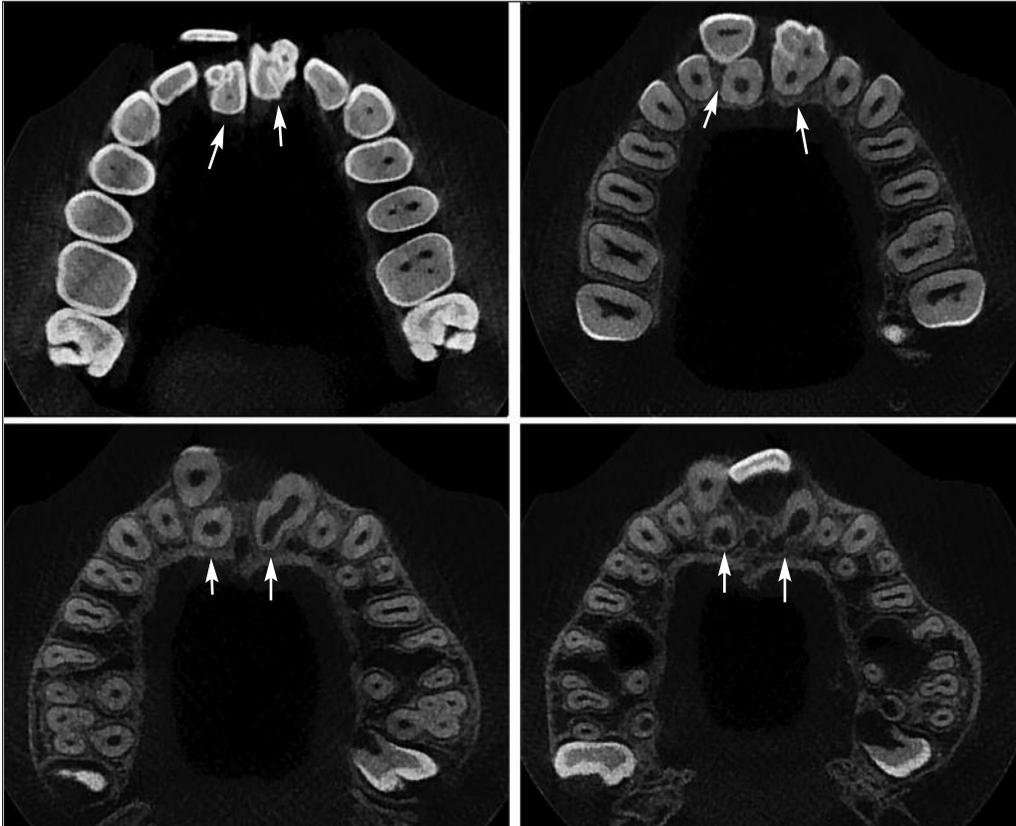
Based on the clinical and radiographic assessment, the right mesiodens was diagnosed as a supplemental mesiodens associated with talon cusp, and the left mesiodens diagnosed as tuberculate mesiodens resembling a geminated tooth.

3D CBCT volume rendering reconstructed images showed the morphology and association of the teeth obviously (Figure 6).

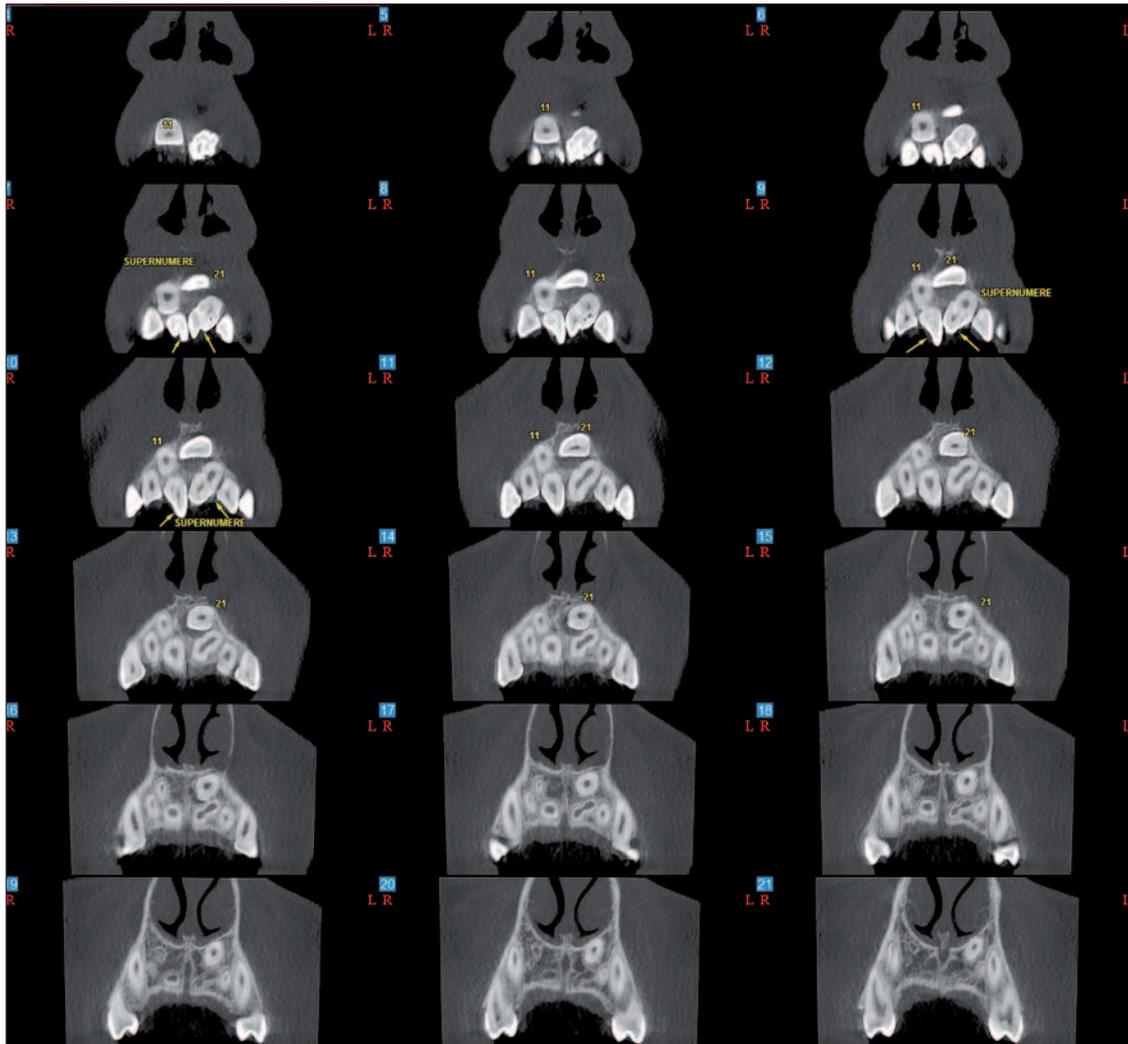
In consequence of clinical and radiographic examination, bilateral mesiodens extracted and orthodontic treatment was initiated to achieve an esthetic appearance, eruption of left maxillary central incisor and optimal occlusion.

## DISCUSSION

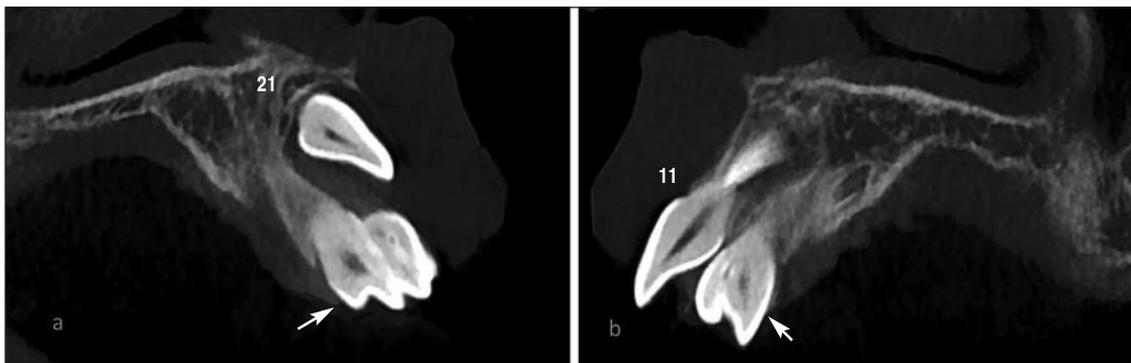
Mesiodens is the supernumerary tooth of the anterior region of the maxilla and the mandible. These teeth are classified according to their shape. Supplemental mesiodens, also termed as incisiform mesiodens resembles anterior teeth in both shape and size.<sup>12</sup> In this case, the right mesiodens resembles a lateral tooth with a talon cusp and can be classified as a supplemental mesiodens. On the other hand, rudimentary or dysmorphic mesiodens



**FIGURE 3:** Axial images showing contact of the right mesiodens with cingulum of the right maxillary first incisor and uncompleted root formation of left mesiodens.



**FIGURE 4:** Coronal images showing morphology, location and relation of the teeth. Mesiodens with talon cusp was at the palatal side of the right maxillary central incisor. Crown of the impacted left central incisor was in contact with the middle third of the root of the right central incisor.



**FIGURE 5:** Sagittal images of mesiodens **a-** Left mesiodens with multiple-cusps and impacted left central incisor **b-** Right mesiodens with a talon cusp.

has an unusual shape and usually smaller size. Dysmorphic mesiodens can be divided into three groups according to their shape. One of them is

conical form, which is the most common type, is small and peg-shaped teeth with completely formed root.<sup>12</sup> Impacted conical mesiodens is rarely

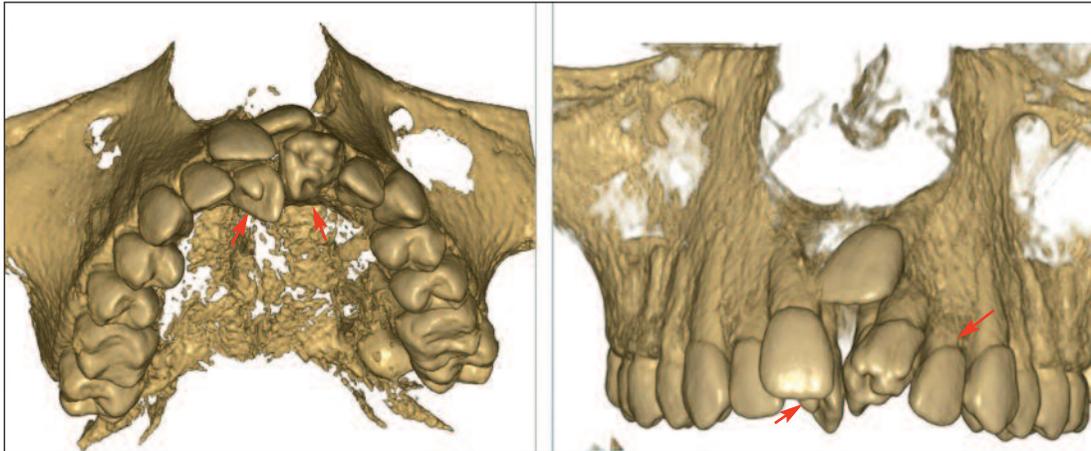


FIGURE 6: 3D CBCT volume rendering reconstructed images showing the morphology and relationships of the teeth.

seen, usually when the teeth is inverted.<sup>13</sup> Tuberculate form has a short, barrel-shaped crown with numerous tubercles or cusps, and have incomplete or abnormal root formation.<sup>12</sup> Left mesiodens have several cusps with an unusual and large crown and root morphology and can be diagnosed as tuberculate mesiodens. The last type is molariform mesiodens, which is rarely seen, and has a premolar-like crown and a completely formed root.<sup>12</sup>

Talon cusp is a morphological anomaly that is seen most commonly on the lingual side of the anterior teeth. It can be seen solely or with syndromes Rubinstein-Taybi syndrome or with other dental anomalies such as fusion, gemination, dens invaginatus and rarely seen in association with mesiodens similar to our case.<sup>6,7,10,14</sup>

Hattab et al. classified talon cusps into three groups.<sup>10</sup> First type is termed true talon, which projects from the palatal surface of the anterior tooth at least half the distance from the cemento-enamel junction to the incisal edge. Second type is semitalon, which projects less than the half distance from the cemento-enamel junction to the incisal edge but it has at least 1 mm length and blends with the palatal surface or stands away from the crown. Third type is trace talon, which has different shapes such as conical, bifid, or tubercle-like with enlarged or protuberant cingulum. In our case talon cusp was on the palatal surface of the right mesiodens and 6.6 mm away from the cemento-enamel junction to the incisal edge, more than the

half distance of the crown. So it can be coincided with the definition of true talon cusp.

Mesiodens and talon cusp can cause various complications. The most common complications of mesiodens are to cause eruption delay of permanent teeth, displacements of permanent maxillary incisors, especially displace incisors labially and cause midline diastema. Besides, less common dental complications are crowding, resorption of adjacent roots, dilaceration of permanent teeth and cyst formation.<sup>3,12</sup> Talon cusp can cause dental complications including occlusal interference, esthetic impairment, caries, displacement of teeth, periodontal problems and irritation of the tongue.<sup>11</sup>

In the present case, parallel with the literature, left mesiodens caused failure of eruption of the left maxillary central incisor and right mesiodens displaced right maxillary central incisor labially. Radiographic images may fail to locate the impacted teeth accurately because of superimposition of adjacent structures. The panoramic radiograph of the patient provided insufficient information to diagnose accurately the location of the left central incisor in the vertical and horizontal planes and exact relationship with the adjacent teeth. CBCT images are valuable determining the left maxillary incisor location and angulation; they are also useful in determining the proximity of impacted incisor to the roots of adjacent right incisor and left lateral, as well as the degree of the resorption. Diagnosis of root resorption may decrease

complications during treatment and can alter the treatment plan. These features are important in treatment planning to move the left incisor in the arch and decrease the risk of root resorption of the adjacent teeth.

Therefore, the presence of these anomalies has importance and early diagnosis is essential to reduce complications. Treatment choices vary according to the developmental stage of the dentition. In the primary dentition, if the supernumerary tooth is unerupted, surgical extraction may cause displace or damage on the permanent incisor, so extraction of mesiodens is not suggested. However, in the early mixed dentition stage, extraction of mesiodens can cause spontaneous erup-

tion of the permanent central incisors. In the permanent dentition stage, with the extraction of mesiodens normal eruption chance of the incisors is reduced, and surgical and orthodontic treatments are more frequently required.<sup>15</sup> In our case, the patient was 13 year-old and in the permanent dentition stage. Both of the mesiodens were erupted, so mesiodens were extracted and orthodontic treatment with surgical extrusion of the impacted central was made.

In conclusion, early and correct diagnosis may prevent need for complex orthodontic and surgical treatments. CBCT is a valuable tool for evaluation and determination of the accurate location of the impacted teeth and morphology of the mesiodens.

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