Case Report / Olgu Sunumu

Surgical Treatment of a Large Complex Odontoma

Dev Kompleks Odontomanın Cerrahi Tedavisi

Burak Cezairli[1], Fatih Taşkesen[3], Ümmügülsüm Coşkun[4], Neslihan Seyhan Cezairli[2], Emre Tosun[5]

[1]Ordu University Faculty of Dentistry, Department of Oral and Maxillofacial Surgery, Ordu, Turkey
[2]Ordu University Faculty of Dentistry, Department of Orthodontics, Ordu, Turkey
[3]Erzincan University Faculty of Dentistry, Department of Oral and Maxillofacial Surgery, Erzincan, Turkey
[4]Karadeniz Technical University Faculty of Dentistry, Department of Oral and Maxillofacial Surgery, Trabzon, Turkey
[5]Hacettepe University Faculty of Dentistry, Department of Oral and Maxillofacial Surgery, Ankara, Turkey

Abstract

The treatment modalities for odontomas are generally depend on the tumors size. Small and medium lesions can usually be removed easily allowing preservation of surrounding anatomical structures. In our study, we reported a conservative surgical treatment of a large complex odontoma. A 19-year-old woman was referred to our clinic after an incidentally observed lesion on her right mandibular angle. The patient was symptom-free at the time of visit. Computed tomography (CT) images showed a mass with a size of 3.5 cm x 3 cm x 2 cm. CT sections and tridimensional images showed partially eroded buccal and lingual cortex. Surgical treatment was indicated with an initial diagnosis of compound odontoma. The lesion removed after sectioning with bur and maxillo-mandibular fixation (MMF) were not thought to be necessary while the buccal and lingual cortexes were mostly reliable for preventing a fracture. In our case, the size of the odontoma was suitable for a conservative treatment method and with this modality we managed to prevent a possible fracture and eliminate the disadvantages of MMF.

Keywords
Odontoma, fracture, orthodontics, conservative

Anahtar Kelimeler
Odontoma, fraktür, ortodonti, konservatif

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Address for Correspondence/Yazışma Adresi:
Burak Cezairli MD,
Ordu University Faculty of Dentistry,
Department of Oral and Maxillofacial Surgery,
Ordu, Turkey
Phone : +90 0 452 212 12 89
E-mail : burakcezairli@hotmail.com
ORCID ID: orcid.org/0000-0002-1196-9840

Öz

Odontomaların tedavi yöntemleri genellikle tümör boyutuna bağlıdır. Küçük ve orta boyuttaki lezyonlar genellikle çevredeki anatomik yapılara zarar vermeden kolaylıkla çıkarılabilir. Çalışmamızda dev bir odontomanın konservatif bir şekilde cerrahi tedavisi ele alınmaktadır. On dokuz yaşındaki kadın hasta, sağ mandibular angulusta radyolojik muayene sırasında fark edilen bir lezyon sonrasında kliniğimize sevk edildi. Hasta, muayene esnasında semptomsuzdu. Bilgisayarlı tomografi (BT) görüntüleri 3,5 cm x 3 cm x 2 cm boyutlarında bir kitleyi gösterdi. BT kesitleri ve üç boyutlu görüntülerde kısmen aşınmış bukkal ve lingual korteks görüldü. Kompound odontoma tanısı koyulan lezyonun cerrahi yaklaşımla tedavi edilmesine karar verildi. Bukkal ve lingual kortekslerin kırığı önlemede yeterli kalınlıkta olduğu olguda freze edilerek parçalar halinde uzaklaştırılan lezyon sonrasında maksillo-mandibular fiksasyon (MMF) gibi yöntemlerin gerekli olmadığı düşünüldü. Bizim olgumuzda, odontomun büyüklüğü konservatif bir tedavi yöntemi için olmasıyla beraber hem olası bir fraktür önlemiş hem de MMF'nin dezavantajlarını ortadan kaldırılmıştır.

Introduction

Odontomas are defined as developmental malformations that are hamartomas of odontogenic origin. Depending on their slow growth and non-aggressive behavior they are classified as benign tumors (1). Histologically there are two types of odontomas; compound odontomas consist of all dental tissues resembling a tooth-like structure and complex odontomas are present as disorganized mass (2).

Odontomas are generally diagnosed during explorations because of a delay tooth eruptions or incidentally on control radiographs in the first two decades with no specific gender prediction (3,4). While they often manifest without symptoms, erupted or excessively large tumors can cause infection, abscess formation, swelling, pain and paresthesia (5). Although odontomas are predominantly associated with permanent teeth, they also occur in association with primary teeth and are often involved with impacted teeth (1,6,7).

Large retrospective studies have shown that the site of predilection of compound odontomas are the anterior maxilla, whereas complex odontomas preferably develop in the mandible in various sites (8). While compound odontomas are approximately twice as common as complex odontomas they both have a slightly high prevalence in maxilla than the mandible (9).

Etiology is not clear but trauma, infection, genetic and hereditary are accepted as the possible causes (8,10).

The treatment modalities for odontomas are generally depend on the tumors size. Small and medium lesions can usually be removed easily allowing preservation of surrounding anatomical structures, but in large odontomas which conservative approaches are not efficient for removal, more invasive treatment modalities can be needed like Le Fort I and sagittal split osteotomies (SSO) (9,11). There are no reported recurrence cases of treated patients for odontomas.

The purpose this study is to report of large compound odontoma of the right mandibular angle that was treated with a minimally invasive intraoral approach, with discussing the treatment modalities on similar cases.

Case Report

A 19-year-old woman was referred to our clinic in January 2012 after an incidentally observed lesion on her right mandibular angle.

She had no significant medical history. Minimal facial asymmetry was observed on the right side during extraoral examination. Intraorally a small swelling shaped like an unerupted tooth was visible on right retromolar region in contact with the distal surface of the first molar where the second and third molars were missing. There was a clinically detectable swelling on the lingual side and on the buccal side

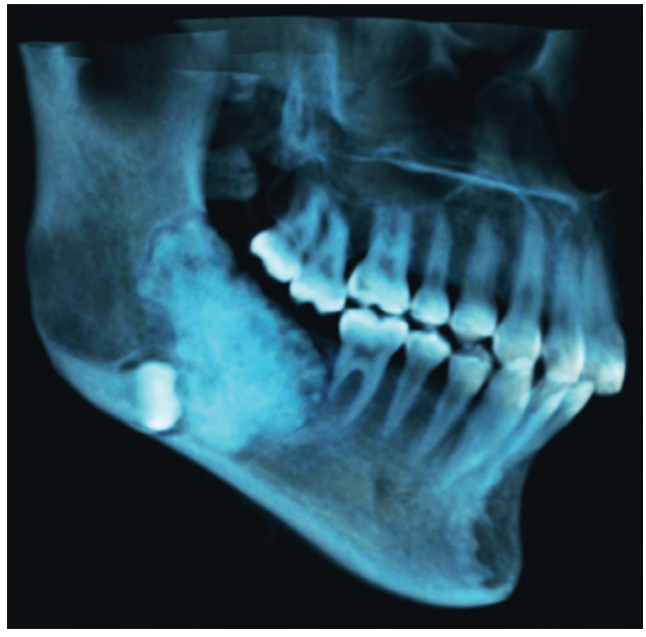

Figure 1. Preoperative tridimensional cone beam computed tomography image

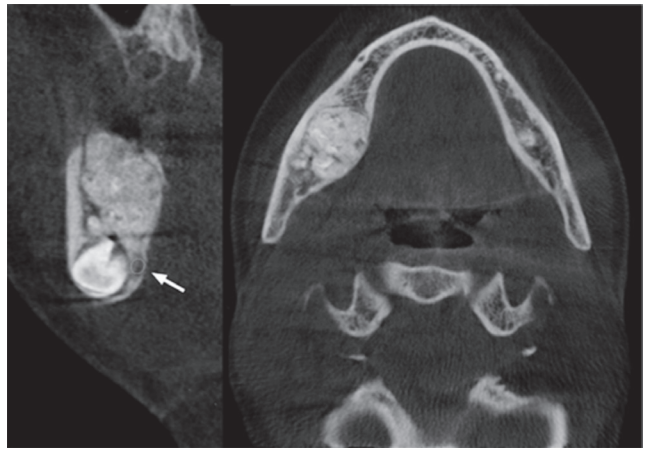

Figure 2. Preoperative axial and coronal cone beam computed tomography images. White arrow: Inferior alveolar nerve

swelling was slightly excessive when compared to the lingual side. The patient was symptom-free at the time of visit.

Radiographic evaluation revealed a well-circumscribed radiopaque mass extending between the distal of first molar and ascending ramus over an impacted tooth. Computed tomography (CT) images showed a mass with a size of 3.5 cm x 3 cm x 2 cm for anterior-posterior, cranial-caudal and medial-lateral dimensions consecutively (Figure 1). CT sections and tridimensional images showed partially eroded buccal and lingual cortex (Figure 2). The inferior alveolar neurovascular (IAN) bundle was pushed away by the tumor to the basis of the mandible.

On the basis of clinical and radiological findings, surgical treatment was indicated with an initial diagnosis of compound odontoma. Surgical removal under intravenous sedation was planned. Similar methods like maxillo-mandibular fixation (MMF) were not thought to be necessary while the buccal and lingual cortexes were mostly reliable for preventing a fracture. A similar full-thickness incision which is used in sagittal split osteotomy was performed between ascending ramus and first molar for removal of the tumor (Figure 3). For preserving the residual bone cortex on both sides a technique used in removing third molars was considered for removal of the lesion which consists of sectioning and removing fragments (Figure 4). This technique was useful to remove all the tumor tissues in contact to bone which is our aim to protect for preventing an intraoperative or postoperative fracture by not weakening the bone cortex. After removing the tumor, the impacted tooth removed with known methods (Figure 5). Maximum care was taken to protect the IAN which is exposed after removing the bottom layer of the tumor. Remaining bone walls were check for any remaining lesion. The wound was primarily closed without tension. Patient was prescribed an antibiotic, analgesic and mouth rinse and advised for soft diet and opening her mouth minimally.

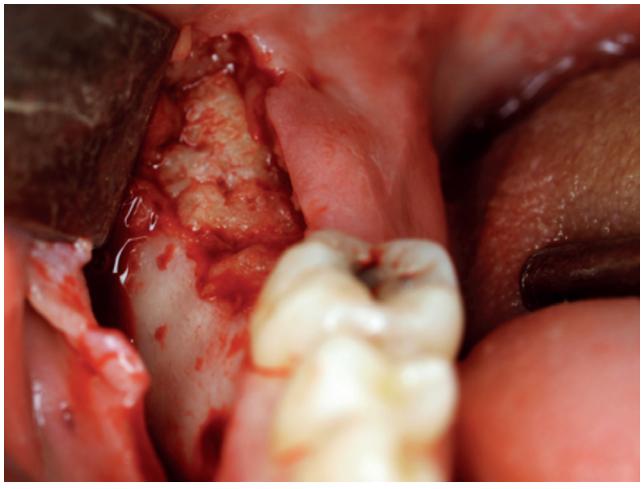

Figure 3. Intraoperative image 1

Figure 4. Intraoperative image 2

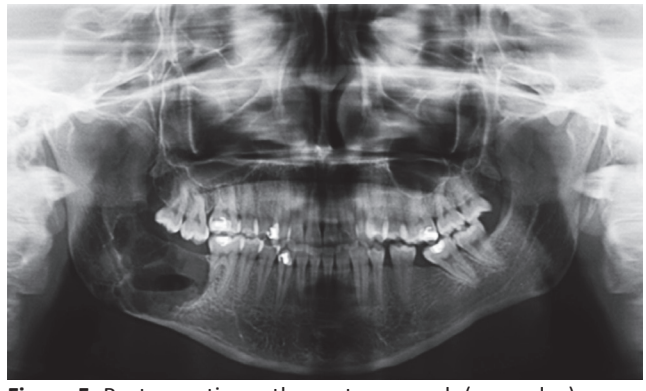

Figure 5. Postoperative orthopantomograph (same day)

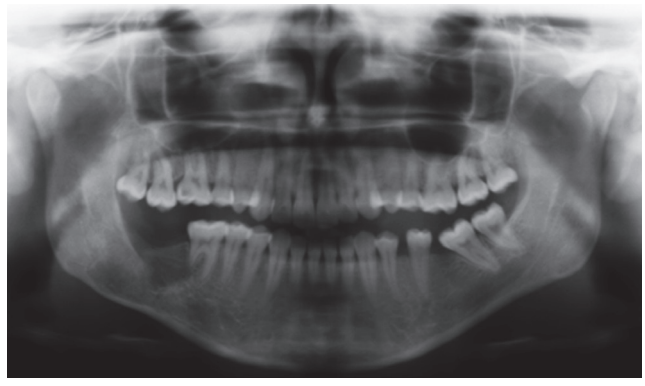

Figure 6. Postoperative orthopantomograph (18th month)

Changing course of daily habits is a challenging task, to achieve this problem we used orthodontic elastic between molar and canine instead of MMF. An orthodontist placed the brackets and used 3/16-inch latex elastics between those teeth. These elastics helped our treatment in two ways. First, they developed a control mechanism by a tension sensation by limiting the patient's mouth opening, which acts like a feed-back mechanism in our opinion. Second, the vectorial force of the elastics diminished the tension band on the external oblique line, which was weaken due to surgery, partially neutralized the infra hyoid muscle forces. Brackets were removed after one month.

Histopathologic examination confirmed the diagnosis of a complex odontoma. No clinical or radiographic evidence was observed of recurrence of the tumor and sensation of the IAN was fully recovered after 18 months of follow-up (Figure 6).

Discussion

Odontoma was the most common odontogenic tumor with a 41.8% incidence in our region as a result of our pre-published study and was found to be the second most odontogenic tumor in a previous study (4,12). Gender distribution was found to be equal (3,4). The mean age at diagnosis was 27.9 with a peak of between age 10 to 19 while compound odontomas were diagnosed at a younger age than were complex odontomas and they are often diagnosed during explorations because of a delay tooth eruptions or incidentally on control radiographs (7,10).

While the etiology is unclear they are often associated with an unerupted tooth. Pathologic changes such as impaction, malpositioning, aplasia, malformation and devitalization of adjacent teeth are associated with 70% of odontomas (13).

Second mandibular molar was only involved in 5% of the cases, retention of mandibular first and second molars are extremely rare and odontomas suggest to be the only cause (14). In our case mandibular second molar was missing and the impacted tooth assumed as the third molar by considering its crown and root formation. Regarding to their unique manifestation odontomas are generally easy to identify and differentiate on panoramic radiographic than other neoplasms while they are often associated with a impacted tooth (15).

Extensive radiologic methods such as CT and cone-beam CT are not indicated in regular basis because of the early ages of diagnoses is much more sensitive period to radiation than adults. However in some cases with large odontomas it is mandatory for surgical planning.

There are four surgical approaches suggested for enucleation of the tumor in mandible; removing buccal cortex, removing lingual cortex, segmental osteotomy via an extraoral submandibular incision and SSO (11); for maxilla Le Fort I osteotomies are used in some cases with large odontomas (9). Blinder et al. (16) described the intraoral buccal and lingual approach and discussed the advantages and the possible risks of dysesthesia of the tongue and fracture of the mandible. Savitha and Cariappa (17) used an extraoral approach for enucleation of an ameloblastic fibro odontoma in a 5-year-old boy. According to literature SSO was found to be the most preferred approach for large mandibular lesions.

In our case considering the lingual and buccal cortex volume, SSO was not the first choose of our treatment. The lesion were removed with sectioning, the remaining bone cortexes was preserved and the elastics are used to minimize the mouth opening by diminishing the tension forces (18) on the mandible by presenting a force opposite of infrahyoid muscles which are active during mouth opening. The elastics were used for 6 weeks which is generally enough time for healing of mandible and they also help the treatment course forming a feed-back mechanism by limiting the mouth opening by providing a tension force. Orthodontic appliances like tongue crib have to be used for at least 6 months to change the visceral sucking habit but in our cases it was enough to control mouth opening for 6 weeks.

The thresholds for our treatment method is not well defined. In the literature most of the cases presented with a significant eroded buccal and/or lingual cortex in a contrast to our case. There is no evidence on how much remaining bone could prevent the fracture of the mandible while there are so many variables could effect this complication. On the other hand the using of orthodontic brackets and elastics is not a common modality in similar cases. While MMF has the higher chance for preventing a possible fracture, it has many disadvantages like poor oral hygiene, risk of aspirating the gastric content in case of vomiting, insufficient nutrition, social restrictions and higher myoatrophy.

In our case the size of the odontoma was suitable for a conservative treatment method and with this modality we managed to prevent a possible fracture and eliminate the disadvantages of MMF.

Ethics

Informed Consent: It was taken.

Peer-review: Externally and internally peer-reviewed.

Authorship Contributions

Surgical and Medical Practices: E.T., B.C., F.T., Ü.C., N.S.C., Concept: B.C., N.S.C., Design: B.C., F.T., N.S.C., Data Collection or Processing: B.C., F.T., N.S.C., Analysis or Interpretation: B.C., F.T., N.S.C., Literature Search: B.C., F.T., Writing: B.C., N.S.C.

Conflict of Interest: No conflict of interest was declared by the authors.

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