

Sequential Removal of a Large Odontoma in the Angle of the Mandible

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Abstract

Odontomas are the commonly occurring benign tumors of the jaw, which are odontogenic in origin. Lesion originates as the dental components are laid down in a disorganized manner, due to failure of normal morphodifferentiation. They are considered as hamartomatous developmental malformations rather than a true neoplasm. Mostly, these asymptomatic lesions are discovered as an incidental finding. Large odontomas may give rise to local disturbances, such as eruption delay of permanent teeth, asymmetric tooth eruption, malpositioning, displacement, resorption, or occasional devitalization of adjacent teeth. Odontomas may erupt into the mouth and tend to be associated with impacted teeth and other cystic lesions. The odontomas have a tendency to become symptomatic due to local infection such as sinusitis, infected adjacent tooth, and the exposure of tumor to oral environment. The aim of this paper is to elucidate the primary features and treatment of these lesions, depending on published data and individual witness.

Keywords: Complex odontoma, odontogenic tumor, odontoma surgical procedure

INTRODUCTION

Odontoma has been used for any tumor of odontogenic origin. Odontomas have been known as mixed odontogenic tumors since they are composed of both epithelial and ectomesenchymal components and are seen to have a deficit in the structural arrangement. This has led to an opinion that odontomas are hamartomatous lesions than a true neoplasm.^[1] Odontomas are either inherited or associated with trauma during primary dentition as well as with inflammatory and infectious processes, hereditary anomalies (Gardner's syndrome, Hermann's syndrome, and otodontal syndrome), odontoblastic hyperactivity, and alterations of genetic components responsible for controlling dental development.^[2,3] The distinction between complex and compound odontoma is arbitrary, being based on the preponderance of well-organized denticles as opposed to a preponderance of disorganized dental tissues rather than based on any absolute difference. According to the literature, the prevalence of odontome is more common in females and is usually seen in children and adolescents, with a peak incidence seen in the second decade of life. The anterior portions of the jaws are the most common site of occurrence. Compound

odontomas are common than complex odontomas. Usually, odontomas are asymptomatic in nature; however, pain and swelling were the common clinical symptoms. It can also occur as a component of combined odontogenic tumor, most commonly calcifying cystic odontogenic tumor, and could also be associated with dentigerous cysts.^[4,5]

Clinically, central odontoma (intraosseous) is the most common variant than that of extraosseous type (peripheral) which could be found in the oral mucosa covering tooth-bearing areas of the maxilla and mandible. The erupted odontomes are essentially intraosseous odontome which erupted out into the oral cavity.^[6,7]

Radiographically, the lesion appears as a radiopaque mass surrounded by a radiolucent halo with regular borders. Surgical removal is the treatment of choice in most of the cases. Although there is a little probability of recurrence, a

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valuable time course observation is needed, especially in young children.^[8,9] A summary of the surgical procedure is present in Table 1 for complex odontomas seen in the mandibular posterior region.

CASE REPORT

A 12-year-old female patient along with her mother reported to the oral and maxillofacial surgery clinic with the chief complaint of swelling in the left lower back teeth region. On intraoral examination, a diffuse smooth swelling was found in the left mandibular angle extending till the lower border associated with an impacted second molar tooth. Expansion of both the buccal and lingual cortices was observed, and the area was firm and nontender. Mouth opening was within normal limits.

Radiograph revealed a radiopaque mass in the left mandibular angle region measuring 4 cm × 3 cm with well-defined borders

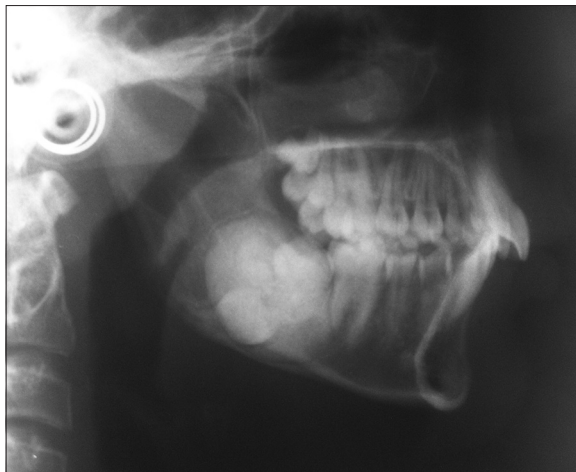


Figure 1: Lateral cephalogram image of the odontoma

and a radiolucent lining associated with the impacted second molar tooth [Figure 1].

Computerized tomographic image was suggestive of a well-defined rounded amorphous bony dense mass involving the left-sided angle of the mandible. The mass is principally arising from the left lower impacted second molar tooth with the intact cortex of the mandible and the lower border being very thin. The lesion was provisionally diagnosed as complex odontome [Figure 2]. The differential diagnosis would include osteoma and cemento-ossifying fibroma.

After obtaining consent from the parents, surgical removal of odontome was planned in two stages after routine hematological investigations. The first stage of removal was done under general anesthesia. A regular third molar mucoperiosteal flap was retracted, and a bony window was created to expose the underlying odontome which was removed in sections. One-fourth of the odontome was left out intentionally *in situ* avoiding the fracture of the mandible and the extraction of the first molar, considering the age of the patient. The excised lesion was preserved for the histopathological examination [Figures 3-6].

After 4 months, the second stage of surgery was planned. Unfortunately, the patient turned up only after 8 months with complaints of rough feeling over the alveolar ridge of the surgical area. The intraoral examination revealed a yellowish white sequestrum-like material which was exposed slightly through the oral mucosa, and orthopantomogram (OPG) was taken. It revealed a radiopaque mass just approaching the crest of the alveolar ridge. It was confirmed that the remaining one-fourth of the odontome erupted and reached the crest of the alveolar bone exposing itself into the oral cavity and it was removed surgically under local anesthesia. The wound was closed with 3-0 vicryl after achieving hemostasis. The

Table 1: Summary of the various treatment procedures for mandibular posterior complex odontoma

Author and year	Age of the patient	Literature report	Odontome characteristics	Surgical technique	Follow-up
Blinder <i>et al.</i> , 1993 ^[10]	27 and 22 years, men	Two case reports	Large complex odontome at the angle of mandible	Excision via buccal approach and intermaxillary fixation for the first case and arch-bar fixation with lingual approach for the second case	Not mentioned specifically
Goran Knezevic <i>et al.</i> , 2005 ^[11]	23 years, man	Case report	Complex odontome at the angle of the mandible	Two-stage surgical procedure. First-stage upper part and 3 months later, the lower part with the impacted teeth	1 year
Bruno Ramos Chrcanovic <i>et al.</i> , 2010 ^[12]	21 years, man	Case report	Complex odontome at the angle of mandible	Two-stage surgical procedure. First stage most part and fixation for four weeks and three months later, the remaining lesion with the impacted teeth	5 years
Perumal <i>et al.</i> , 2013 ^[13]	24 years, female	Case report	Complex odontome at the posterior mandible with missing two molars	Surgical enucleation	6 months
Nogueira <i>et al.</i> , 2015 ^[14]	35 years, woman	Case report	Complex odontoma at the angle of mandible	Corticotomy (buccal) and the tumor is removed in pieces along with the unerupted tooth fixed by titanium plates of 1.5 mm	10 months
Cezairil <i>et al.</i> , 2017 ^[15]	19 years, female	Case report	Complex odontoma at the angle of mandible	Full-thickness incision, sectioning, and removing the fragments and orthodontic elastics after surgical removal	18 months
Akbulut 2018 ^[16]	16 years, females	2 case reports	Complex odontoma at the posterior part of the mandible	For the first case, both intraoral and extraoral approach with titanium plate fixation, and for the second case, intraoral approach without any reconstruction	4 years and 1.5 years

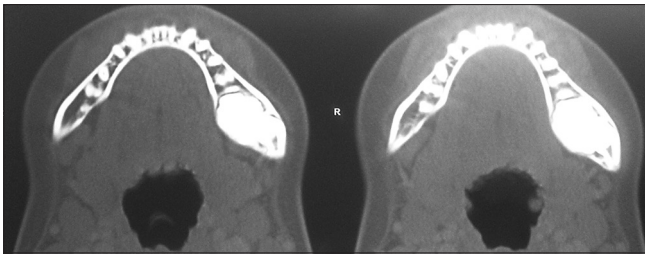


Figure 2: Computed tomography view of the odontoma

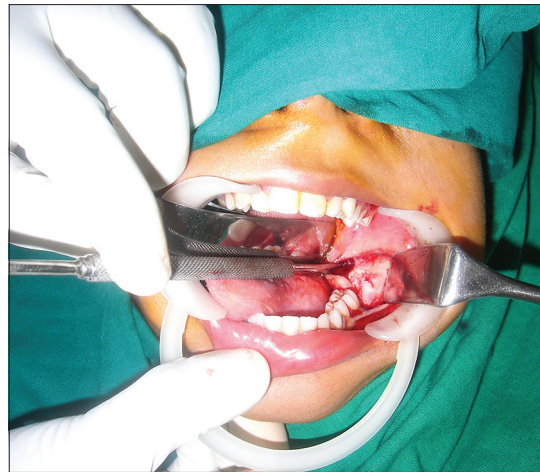


Figure 3: First stage of surgical removal



Figure 4: First stage of surgical removal (after excision)

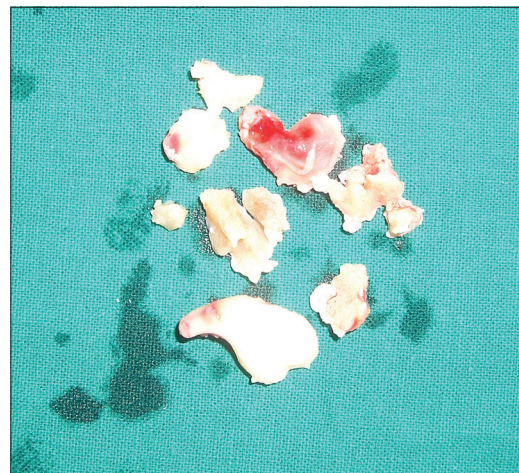


Figure 5: Excised lesion

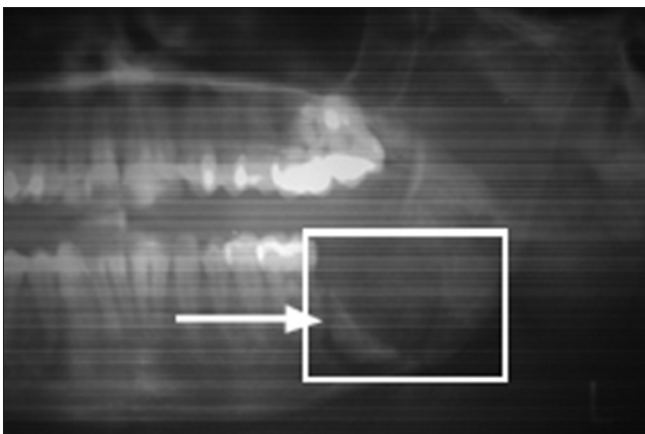


Figure 6: Orthopantomogram showing the remaining portion of the lesion

excised lesion after reassembling revealed a bony mass and was sent for histopathological examination which confirmed the diagnosis of complex composite odontoma [Figure 7]. This presentation of residual odontoma eruption without the impacted teeth is very unusual.

The follow-up OPG after 6 years showed complete healing of that area without any recurrence.

DISCUSSION

Complex composite odontoma was described as a distinct entity for the first time by Broca in 1866. Complex odontomas

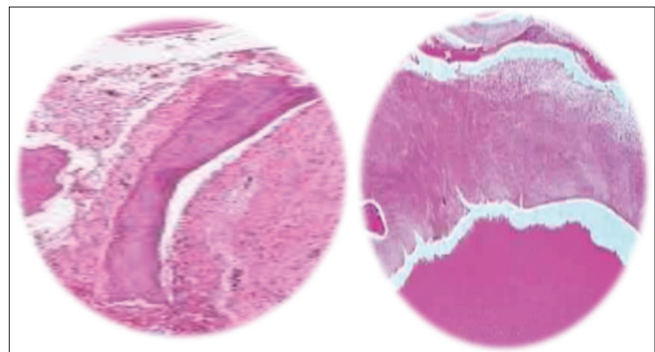


Figure 7: Photomicrograph ($\times 10$) showing eosin-stained odontogenic components with adjacent clear spaces are appreciated indicating the components of complex odontoma

are slow-growing, benign tumors showing nonaggressive behavior.

This report is regarding a case of “complex odontoma” which was removed successfully by a two-stage sequential surgical procedure. Various treatment modalities have been described for the treatment of odontoma. The size, location, extension

of the lesion, histological aspects of odontoma, and age of the patient are the important factors which have to be considered while doing the surgical planning.

Blinder *et al.* in 1993 reported that intraoral excision of the lesion via lingual cortex could be chosen for complex odontoma of the mandible to avoid unwanted fractures as the lingual cortex is much thinner than the buccal cortex. They also suggested that although dysesthesia of the homolateral tongue is the expected complication, it can be avoided with carefully elevated mucoperiosteum and protected by a curved retractor. This method also depends on whether the lingual and buccal cortical plates are eroded.^[10]

Knezevic *et al.*, in 2005, suggested the two-stage surgical removal of odontoma. It has been explained that osteosynthesis and intermaxillary fixation could be avoided by this method.^[11]

Chrcanovic *et al.*, in 2010, stated a two-stage surgical procedure for a large complex odontome at the angle of the mandible. In the first stage, most part of the tumor has been removed via lingual approach incision since the cortex was completely eroded and fixation was done for 4 weeks. Three months later, the remaining lesion was removed with the impacted teeth to avoid pathological mandibular fracture.^[12]

Perumal *et al.*, in 2013, treated a case of sequestering complex odontoma over the posterior border of the mandible by surgical enucleation and packed with bismuth iodine paraffin paste soaked in a ribbon gauze.^[13]

Nogueira *et al.*, in 2015, treated a case of complex odontoma with no cortical expansion by a buccal corticotomy and fixation with titanium plates of 1.5 mm after the tumor is removed. The authors suggested that this method would keep the mandibular architecture and minimize the risk of fracture after surgery.^[14]

Cezairil *et al.*, in 2017, treated a case of large complex odontoma in a mandibular angle using full-thickness incision and sectioning and removing the fragments since the buccal and lingual cortex volume was sufficient. After the surgery, orthodontic elastics were placed between the canine and molar to minimize the mouth opening, diminishing the tension band on the external oblique ridge, and neutralizing the infrahyoid muscle forces.^[15]

Akbulut, in 2018, treated a case of large complex odontoma of the mandible by using both intraoral and extraoral surgical methods and reconstruction was done with titanium plates.^[16]

The present reported case was also planned similar to Knezevic *et al.* The surgery was planned for sequential removal of the tumor in two stages to avoid the fracture of the angle of the mandible and to preserve the first molar since accessing the tumor intraorally might have compromised the teeth. By considering the age of the patient, major portion of the tumor was removed at the first stage and the remaining portion which was close to the first molar and inferior border was left *in situ* purposefully for subsequent sequential removal after 4 months. The wound was closed with aseptic care. The procedure was

well explained and accepted by the patient before the surgery. Unfortunately, the patient turned up only after 8 months with complaints of rough feeling over the surgical area, and the erupting left out portion of odontoma was removed under local anesthesia after confirming radiographically. For a two-stage surgical removal of odontome, the patient has to be advised regarding the significance of the second-stage surgical procedure.

It has been described that the eruption of odontoma without association of impacted teeth might be due to remodeling and resorption of overlying bone. The different absorption stages of alveolar bone can be seen in those cases and concluded that the possible mechanism of eruption could be multifactorial.^[17]

The present case demonstrates the unusual presentation of spontaneous eruption of odontoma during the follow-up period. This unexpected complication could be avoided by proper patient instructions and different management approaches. The eruption of the remaining portion of odontoma could be due to remodeling and resorption of overlying bone. Since this patient is young and the inherent growth pattern of mandible still persists, the precise molecular mechanism behind the eruption phenomena has to be explored further.

Macroscopically, lesion consists primarily of a well-delineated, roughly spherical mass of haphazard conglomerate of mature hard dental tissues. A thin fibrous capsule and in some cases a cyst wall are seen surrounding the lesion.

Histopathologically, the decalcified hematoxylin and eosin section of the complex odontoma revealed the presence of disorderly arranged mature hard tissues, dentin, cementum, and soft tissue pulp with empty enamel spaces. The hard tissues were arranged in a pattern depicting tooth-like structures.

CONCLUSION

The present report explains the successful treatment of odontoma in a young individual, with less complication and unusual presentation of spontaneous eruption of residual odontoma during the follow-up period. The eruption could be due to the increasing size of the lesion which may lead to the sequestration of the overlying bone. However, the precise molecular mechanism behind the spontaneous eruption of the remaining odontoma without the impacted teeth has to be explored further. Despite their benign nature, odontoma eruption into the oral cavity can give rise to pain, inflammation, and infection. If two-stage surgery is planned for removal of the lesion, the patient has to be emphasized the importance of the second-stage procedure on time to avoid further complications. The management approach of this kind of lesions has to be planned and implemented by keeping all the favorable and unfavorable factors in each treatment preference.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other

clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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