



A case report of incidental finding of compound odontoma on a panoramic radiograph

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ABSTRACT

Objectives: The purpose of this case study was to report the compound odontoma's founding in a panoramic radiograph.

Case Report: An 11-year-old female patient came with her parents to the pedodontics of Dental Hospital Padjadjaran Bandung with the chief complaint of a palatal bite with an unerupted left maxillary posterior tooth. Then the patient took the panoramic and cephalometry radiographs to confirm the diagnosis. The result from the panoramic radiograph was that there were multiple radioopaques with a tooth-like structure contained,

surrounded by a radiolucent band, and the lesion had a corticated, well-defined border. Radiodiagnosis has been established as a compound odontoma associated with an unerupted maxillary second premolar.

Conclusion: Compound odontoma is a benign tumor that often occurs at the age of tooth development and often causes delayed tooth eruption. Panoramic radiographs as radiographic aids play a very important role in identifying these tumors.

Keywords: Tooth eruption, odontoma, panoramic radiograph

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INTRODUCTION

The most prevalent odontogenic tumor is odontoma, which has a prevalence of 22% compared to other odontogenic tumors. The odontoma is a benign, non-aggressive tumor that develops abnormally during tooth development (hamartoma).¹ Paul Broca initially used the term "odontoma" in 1867. Around 65% of Caucasians and 5.3-11.6% of Indians have odontoma, according to epidemiology.² These tumors are characterized by the production of mature enamel, dentin, cementum, pulp tissue. Some literature considers odontoma to be the final developmental stage of ameloblastic fibroma and fibro-odontoma. However, unlike these other entities, odontomas do not show uncontrolled cell proliferation.³ This results in the development of odontoma lesions that are not aggressive, or asymptomatic, but their growth can affect surrounding tissues.²

Odontomas were classified into two types: compound and complex. Compound odontoma is a lobulated formation of the three dental tissues enamel, dentin, and cementum that typically occurs in the anterior maxilla. The complex type cannot be classified as tooth tissue. It is visible as a radiopaque region with a varied density of dental hard tissue. Typically observed in the posterior mandibular area.⁴ Compound odontoma was found in 63.6% of the anterior maxilla and 36.4% of the

posterior mandible. Men and women are equally susceptible to odontoma. Compound odontoma affects 9-37% of people under the age of 20, while complex odontoma affects 5-30% of people between the ages of 20 and 30. Cases of odontoma can develop at any age but are most common in the second decade of life.²

The majority of odontomas in the front region of the jaw are compound odontomas, while the majority in the posterior portion of the jaw are complex odontomas. Compound odontoma is most frequent in the maxillary incisor-canine area. Complex odontoma is most typically found in the lower jaw's molar and premolar regions. Odontomas are more common in permanent teeth and rarely seen in deciduous teeth.⁴ The etiology of odontomas is still unknown, but they are associated with various conditions such as local trauma, inflammatory or infectious processes, and genetic abnormalities.¹

Panoramic radiographs give a wide field of view for seeing both jaws, making them view odontoma case. According to Buyukcavus et al, panoramic radiographs are utilized as a part of a standard radiographic examination to evaluate odontoma cases.² Radiographically, odontomas appear as solid radiopaque lesions with prominent external margins surrounded by thin radiolucent areas.⁵

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Compound odontomas are composed of small or incomplete tooth structures known as odontoids or denticles, while complex odontomas appear as amorphous and irregular masses of tooth tissue.¹ The purpose this case study was to report the compound odontoma founding in panoramic radiograph.

CASE REPORT

An 11-year-old female patient come with her parents came to the Pedodonsia Department of Padjadjaran University Dental and Oral Hospital Bandung with a chief complaint of palatal bite and unerupted left upper posterior teeth. This patient felt unconfident and wanted to have his teeth treated to improve his facial appearance when smiling. Intra-oral examination found her anterior teeth palatal bite and maxillary left posterior tooth missing (tooth 25) without swelling. Patients were suggested to have a panoramic radiograph and cephalometry examination. Panoramic radiographs

(Pictures 1 and 2) show tooth 25 missing, with multiple radiopaque lesions surrounded by radiolucent bands on the posterior area of the left maxilla. The shape is oval. A thin radiolucent band that appears to be a soft tissue capsule is seen to surround the radiopaque lesion. The corticated border at the lesion's periphery appears as a thin radiopaque image. The anterior teeth were palatal bites on the cephalometric radiograph (Picture 3). On cephalometric radiographs, radiopaque lesions are not visible

DISCUSSION

Odontomas are non-aggressive hamartomatous developmental abnormalities, also known as odontogenic lesions, that can see on routine radiography examination as single or multiple radiopaque lesions.⁵ Odontomas are further sub-classified based on their gross and radiographic features into compound (small tooth-like structures), complex (a conglomeration of dentin,

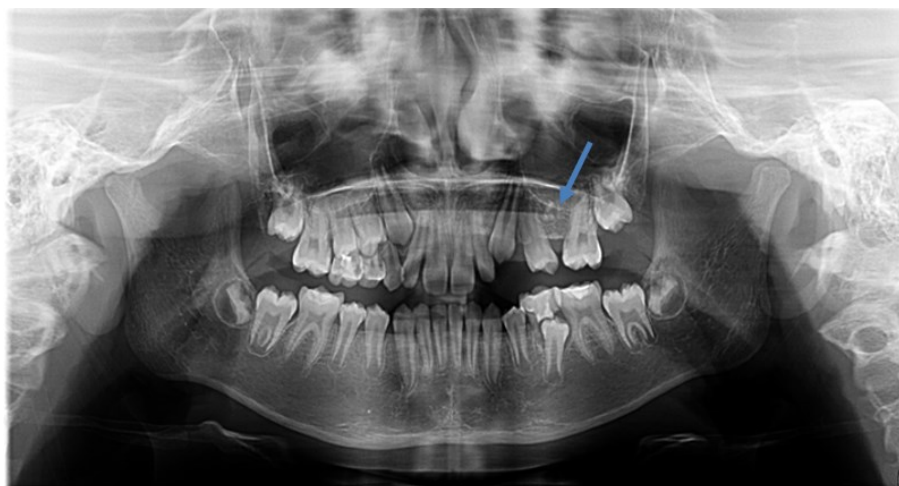


Figure 1. Panoramic radiograph showing tooth 25 missing, with a radiopaque lesion surrounded by a radiolucent band on the superior side



Figure 2. Panoramic radiograph showed a lesion with multiple radiopaque density structures shaped like teeth surrounded by radiolucent with well-defined corticated borders.



Figure 3. Cephalometric radiograph showing palatal bite on the anterior teeth

enamel, and cementum), and cystic. Compound odontomas are more commonly found in the anterior maxilla and appear as a collection of small teeth, leaving few entities in the radiographic differential diagnosis except, perhaps, a supernumerary tooth. In odontoma, a thin radiolucent halo represents the soft tissue capsule and corticated border, indicating a slow-growing benign tumor or cyst.^{6,7} Odontomas' etiology is still unknown. It has associated with a variety of pathological conditions, including local trauma, inflammatory or infectious processes, mature ameloblasts, cell remnants from the dental lamina, hereditary anomalies (Gardner's syndrome and Hermann's syndrome), odontoblastic hyperactivity, and changes in the genetic component in charge of regulating dental development.⁵ The management of odontoma cases is by performing surgical excision, the lesions are usually non-recurrent and non-invasive.^{6,8} This lesion grows slowly and painlessly, and is typically asymptomatic. A significant proportion of cases show evidence of bone expansion. In addition, long-standing lesions can cause limitation of mouth opening, enlargement of the buccal and lingual cortical plates resulting in facial asymmetry, or painful symptoms.⁹ Impacted permanent teeth, prolonged deciduous tooth retention, and occasionally misaligned neighboring teeth are other common indicators. It was also discovered in relation to a missing tooth. Infrequently, odontomas present erupt in the mouth, generally spontaneously, but sometimes linked to a history of traumatic injury in the area.¹⁰

Odontomas are more frequently found in females, according to White and Pharoah (2014), which is consistent with this case report. Odontoma most commonly affects people in their second decade of life, while 10% of cases involve people over 40. Some studies have also reported that there is a correlation between the age of the patient and the type of odontoma involved. The study explained that cases of compound odontoma findings have a higher prevalence in patients in the

growth and development phase and young age.¹¹ The same condition was found in this case, which was experienced by an 11-year-old girl. The anodontia that occurred in tooth 25 may have been caused by the failure of seed formation and was replaced by a change in the tooth denticle material into a radiopaque mass resembling an odontoma.

Partial anodontia, also known as hypodontia, is a congenital dental condition or disorder marked by the lack of one or more teeth. As in this case, partial anodontia develops in the permanent dentition and is observed after the age of tooth growth or grows as another kind of denticle.¹² Partial anodontia is a type of dental agenesis that affects a variety of teeth. The teeth that are most frequently impacted are the mandibular and maxillary premolars, as well as the mandibular and maxillary lateral incisors. The *MSX1*, *PAX9*, and *AXIN2* genes are linked to partial anodontia. Genes linked to partial anodontia have variable expressivity and incomplete penetrance. When the partial anodontia gene is operative, it can result in either no teeth at all or they will grow in the form of microdontia with abnormalities in tooth morphology.^{11,12} In this case, the patient experienced partial anodontia, which resulted in the formation of a compound odontoma in place of the dental seed. As documented in various journals, there is no additional material regarding family history that demonstrates that partial anodontia is hereditary.

Odontoma is an odontogenic tumor that is also a developmental abnormality of epithelial origin (hamartoma). Approximately 70% of all odontogenic tumors found are odontoma cases.¹³ Odontomas can affect individuals in the second and third decades of life, however, without finding prevalence in terms of gender.^{13,14} The most common location of compound odontomas is the anterior region of the maxilla, while complex odontomas are more common in the posterior region of the mandible.^{13,15} Several studies have also found odontomas to be closely related to cases of tooth impaction. Approximately 80% of compound odontoma cases are associated with

impacted or unerupted teeth.

Odontomas are seen as well-defined, radiopaque lesions on radiographs that resemble tooth follicles or dentigerous cysts.¹⁶ In this case report, the maxillary posterior tooth (tooth 25) has not erupted, and on the panoramic radiograph, there was a lesion with multiple radiopaque density structures shaped like teeth surrounded by radiolucent with well-defined corticated borders. An irregular radiopaque lesion with variations in contour and size, consisting of multiple radiopacities called denticles, represents a compound odontoma.¹⁷ This radiopaque lesion prevented the eruption of the maxillary second premolar (tooth 25). When impacted teeth are involved, the tumor typically lies on the permanent teeth's eruption pathway, preventing the connected teeth from normally erupting.^{9,10} Impacted teeth can contribute to develop malocclusion.^{9,18}

There are three types of compound odontomas: the first is the denticular type consisting of two or more separate denticles, each having a crown and root or Hertwig epithelial sheath with a distribution of dental hard tissue comparable to that found in teeth; the second is the particulate type consisting of two or more separate masses or particles that have no macroscopic resemblance to teeth and consist of abnormally arranged dental hard tissue; and the third is the denticulo-particulate type consisting of denticles and masses of particles that are seen together.¹ In this case, a particulate-type compound odontoma was seen.

CONCLUSION

Based on the above case, it is concluded that the patient's complaint about the condition of missing tooth caused by compound odontoma is associated with one of the factors causing malocclusion.

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FOOTNOTES

All authors have no potential conflict of interest to declare for this article. Informed consent was obtained from the patient for being included in this case report.

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