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Case Report

The unforeseen giant – Giant complex odontoma of the posterior mandible

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Abstract

Characteristically asymptomatic and frequently identified during routine radiographic examinations, odontomas represent the most common form of odontogenic tumors. These developmental hamartomas are characterized by the proliferation of enamel, dentin, and varying amounts of pulp and cementum, and are classified as either compound or complex. Although largely without symptoms, odontomas can sometimes manifest with pain and swelling. This study details the presentation of a 20-year-old female patient with a one-month history of swelling in the right posterior mandible, which was subsequently diagnosed as a giant, unerupted complex odontoma. This article also stresses the significance of prompt diagnosis and immediate intervention.

Keywords: Complex odontoma, Odontogenic tumor, Mandible, Giant

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1. Introduction

The term "odontome," first introduced by Broca in 1866, encompassed all tumors of odontogenic origin, defined as outgrowths or transformations of complete dental tissue.[1] In 1946, Thoma and Goldman refined this definition, limiting "odontome" to lesions composed of tooth-like structures.[2]

Odontomas, while the most frequent odontogenic tumors in the oral cavity[3] are importantly considered developmental hamartomas rather than true neoplastic growths.[4]

Characteristically, odontomas are diagnosed during the second decade of life, with the maxilla accounting for 65% of reported cases. A clear predilection exists for compound odontomas in the anterior maxilla, while complex odontomas tend to be localized to the posterior aspects of the jaws.[5]

A literature review of cases published since 2010 revealed only 11 reported instances of 'giant' or 'large' odontomas, primarily complex types, with an inclination for the right posterior mandible." (Imaging Sci Dent 2018; 48: 289-93)[6] The ongoing need for comprehensive scoping and understanding of unique lesions is further underscored by recent systematic reviews on the topic, such as that by Memarpour et al. (Int J Surg Case Rep. 2025). This observation is further supported by our presented case, involving a 20-year-old female patient with a giant complex odontoma in the right posterior mandible.[7]

2. Case Report

A 20-year-old female patient came to our department of oral medicine and radiology with a chief complaint of asymmetry of the face on the right side and intraoral swelling for one month. The patient was apparently alright one month ago, until she started noticing facial asymmetry on the right side and swelling in the lower back region of the jaw. She also complained of occasional, intermittent, sharp shooting pain in the region. Pain was relieved on taking medication. Past medical and dental history were non-contributory.

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Figure 1: Mild facial asymmetry involving right lower third of face

Figure 2: Mild diffuse swelling measuring 3 x2.5cms posterior to 46 till retromolar trigone with obliteration of buccal vestibule.

On extra oral examination, Mild facial asymmetry involving the lower third of the face was seen. (**Figure 1**) Diffuse swelling measuring 3.5x3.2 cm on the right angle of mandible extending anteriorly up to the nasolabial fold, posteriorly up to the preauricular region, inferiorly up to the lower border of mandible, and superiorly up to the malar region was present. Upon palpation, the swelling presented with tenderness and a firm consistency."

Intraoral examination revealed mild diffuse swelling measuring 3 x 2.5 cm located posterior to 46, till retromolar trigone, with obliteration of the buccal vestibule posterior to 46 was seen. 47 was missing. (**Figure 2**) Palpation of the swelling revealed tenderness and a bony hard consistency, accompanied by expansion of both buccal and lingual cortical plates."

Based on the history and clinical findings a Provisional diagnosis of benign odontogenic tumour was given.

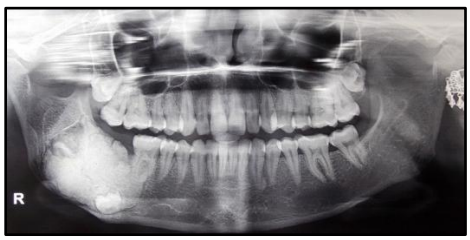

Figure 3: OPG (Carestream 9000C) reveals irregular radiopaque mass with cortical thinning seen. Impacted 47 is seen within the radiopacity.

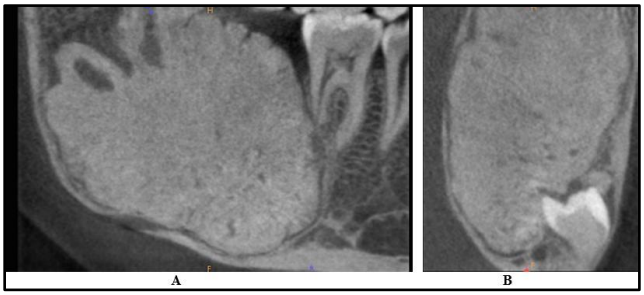

Figure 4: A and **B:** Panoramic and coronal sections of CBCT reveals large radiopaque mass with homogenous internal density and impacted 47. Significant expansion of the buccal and lingual cortices noted.

Radiographic investigations were advised. OPG revealed an irregular radiopaque mass with impacted 47 at the right lower border of the mandible. Radiopaque zone extends antero-posteriorly from the right mandibular ramus up to the mesial root of 46. Inferiorly extending up to the inferior border of the mandible, and is well delineated by a radiolucent line. (**Figure 3**)

Panoramic and axial sections of CBCT reveals large radiopaque mass with homogenous internal density and impacted 47. Significant expansion of the buccal and lingual cortices noted. Resorption of the distal root in relation to 46 noted. Based on the findings radiographic diagnosis of Complex odontome was given. (**Figure 4** A and B)

The treatment plan for total excision of the mass under general anesthesia was followed.

Figure 5: A: Multiple hard tissue bits measuring approximately 5x4x3 cm in size, irregular surface, fused globular masses, stony hard in consistency. **B:** Specimen of extracted right second molar.

Gross examination of the specimen consists of multiple, irregularly shaped and sized fragments of mineralized dental tissues. The absence of recognizable tooth structures and the heterogeneous coloration are consistent with the macroscopic appearance of a fragmented complex odontoma. The surface of hard tissue showed the presence of round to elongated structures, that are white to creamish. (**Figure 5** A and B) shows the Specimen of extracted right second molar.

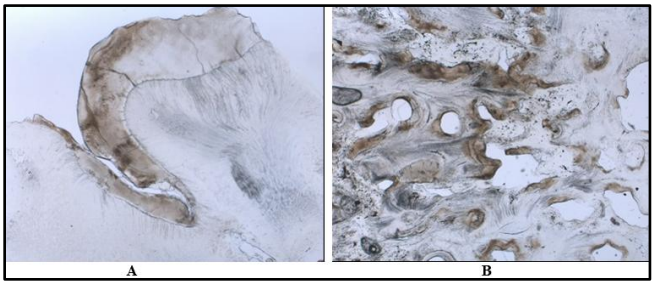

Figure 6: A: Ground section displaying zones of enamel, dentin and dentino-enamel junction. **B:** Decalcified section shows hypocalcified areas of tubular dentin with areas showing mass of globular calcifications.

Ground section showed zones of enamel, dentin, and dentinoenamel junction. Enamel consists of enamel lamellae, tufts and spindles, Hunter-Schreger bands, and incremental lines with an undulated enamel surface. The underlying dentin showed dentinal tubules with typical primary and secondary curvature. (**Figure 6** A)

The decalcified section shows hypocalcified areas of tubular dentin with areas showing a mass of globular calcifications. (**Figure 6** B)

A definitive diagnosis of complex odontoma was confirmed through comprehensive radiographic and histological evaluations.

3. Discussion

Odontomas are the most frequently encountered odontogenic tumors, surpassing the combined prevalence of all other odontogenic tumor types. These lesions are generally classified as developmental anomalies (hamartomas) rather than true neoplasms. A mature odontoma is composed primarily of enamel and dentin, with varying quantities of pulp and cementum. During their earlier developmental phases, odontomas exhibit diverse amounts of proliferating odontogenic epithelium and mesenchyme.[4]

In 1971, the World Health Organization (WHO), led by Pindborg and colleagues, established a pivotal classification for odontomas, distinguishing two types: the compound odontoma, a malformation where all dental tissues are present and arranged in an orderly pattern resembling multiple small, tooth-like structures; and the complex odontoma, which also contains all dental tissues but with a disorderly, haphazard arrangement that does not form recognizable tooth-like structures.

Complex odontomas are more frequently observed in the posterior mandible, while their compound counterparts typically present in the anterior maxilla. Interestingly, both types of odontomas show a predilection for the right side of both the maxilla and mandible. Our case findings align with these established patterns. A study by SY An et al.[8] indicates that odontomas are most frequently diagnosed during the second decade of life, a finding consistent with our present case. This suggests that routine dental examinations in this age group could significantly contribute to the early detection and prevention of complications associated with odontomas. While the mean age of patients diagnosed with giant odontomas is reported as 18.73 years in a recent systematic scoping review by Memarpour et al. (2025) which also confirms the posterior jaws as the most prevalent sites for these lesions, it is important to acknowledge cases that deviate from this average. For instance, the same review highlighted a case of a 6-year-old boy with a giant compound odontoma located in the right posterior maxilla, illustrating the potential for these lesions to present at a much younger age."[7] Sex predilection for odontomas remains a subject of ongoing debate in the literature. However, some studies have reported a higher incidence of compound odontomas in males and a slight female predilection for complex odontomas, a pattern consistent with our presented case.[9]

The precise etiology of complex odontomas remains elusive, with no single definitive cause identified. However, various researchers have proposed a range of contributing factors, including local trauma, infection, family history, and genetic mutations. It's also been suggested that complex odontomas might be inherited through a mutant gene or result from postnatal interference with the genetic control of tooth development.[10,11]

These proposed mechanisms highlight the potential interplay of both environmental and genetic influences in their development. Most of the odontomes are asymptomatic, although occasionally signs and symptoms relating to their presence do occur. These generally consist of unerupted or impacted teeth, retained deciduous teeth, swelling, and evidence of infection.[12] In the present case patient complained of occasional pain in the region.

Complex odontomas typically exhibit limited growth, with their diameter rarely exceeding 3 cm.[13] A study by Miki et al.[14] further supports this, reporting that only 4.3% of odontomas were larger than 3 cm. A literature review since 2010 revealed merely 11 documented cases of "giant" or "large" odontomas, predominantly of the complex type, consistently found in the right posterior mandible (Imaging Sci Dent 2018; 48: 289-93).[6] Notably, the odontoma in our current case measured over 5 cm in diameter. The majority of odontomas are typically diagnosed incidentally during routine radiographic examinations due to their often asymptomatic nature.[12] In our case, the patient had noticed asymmetry of the right side of her face, which prompted her to seek consultation. On radiographs, complex odontoma presents as a well-defined radio-opacity situated in bone, with a density greater than bone and equal to or greater than that of a tooth. It contains a radiolucent halo typically surrounded by a thin sclerotic line surrounding the radio-opacity,[15] which is a distinguishing factor for odontomes from other lesions. Radiographic differential diagnosis of Cementoblastoma, osteoid osteoma, and fibro-osseous lesions, such as cemento-

ossifying fibroma, can be considered. However, none of the above entities have been associated with impacted teeth.

Odontoma has a limited growth potential, but it should be removed because it contains various tooth formations that can predispose to cystic change and which can interfere with eruption of permanent teeth and cause considerable destruction of bone.[16] Because of the very low recurrence, the treatment of choice is surgical removal of the lesion.[17] In our case treatment plan of total excision of the mass under general anesthesia was done.

4. Conclusion

This case report details a significant presentation of a "giant" complex odontoma in the right posterior mandible of a 20-year-old female, aligning with the established demographic and anatomical predilections for this rare, large variant. Despite odontomas being typically asymptomatic and of limited growth, this case highlights that substantial size can lead to noticeable facial asymmetry and localized pain, prompting early clinical presentation. The successful diagnosis, confirmed through comprehensive radiographic and histopathological evaluations, underscores the critical role of advanced imaging, particularly CBCT, in precisely characterizing these expansive lesions, differentiating them from other bony pathologies, and guiding surgical management. This report further emphasizes the imperative of early diagnosis and timely intervention to prevent extensive bone destruction and facilitate optimal patient outcomes, reinforcing the value of routine dental examinations in detecting such unforeseen clinical challenges.

5. Source of Funding

None.

6. Conflict of Interest

None.

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