

Complex Odontoma in the Mandibular Posterior Region: A Case Report

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Abstract

Background: Complex odontoma is a developmental malformation of odontogenic origin in which all dental tissues are represented in a more or less disorderly pattern. It may be associated with failure of eruption or retention of an associated tooth.

Case Presentation: A 25-year-old male presented with a complaint of a retained tooth in the lower left posterior tooth region. There was no history of trauma to the orofacial region, and no swelling or tenderness was noted on palpation. Intraoral examination revealed caries in relation to 26, generalized gingivitis, and an impacted 38. CBCT revealed a radiopaque mass encapsulated within the buccal and lingual plates. An excisional biopsy was performed. Grossly, the specimen consisted of multiple hard tissue bits, predominantly colour, creamish-brown bit containing little soft tissue.

Histopathology: Histopathological examination was consistent with complex odontoma, showing predominantly mature tubular dentin with clefts or hollow circular structures corresponding to spaces previously occupied by enamel following decalcification. Small amounts of enamel matrix or immature enamel may be present, along with occasional eosinophilic epithelial ghost cells and a thin peripheral layer of cementum.

Conclusion: The final diagnosis was complex odontoma. The association of a retained or impacted tooth with a radiopaque mass highlights the importance of radiographic and histopathological evaluation for accurate diagnosis. Simple local surgical excision is the treatment of choice

Keywords: complex odontoma; odontoma; impacted tooth; mandibular posterior region; excisional biopsy; histopathology.

Introduction

Complex odontoma is a benign odontogenic hamartoma in which enamel, dentin, cementum and pulp tissue are formed in a disorganized mass. It commonly develops in the posterior jaws and may interfere with eruption, resulting in retention or impaction of an associated permanent tooth. Arises from the remnants of odontogenic epithelium and ectomesenchyme, which undergo aberrant differentiation and proliferation. May be related to disturbances in the process of tooth development, trauma, infection or genetic factors. Radiographically, it appears as a well-defined radiopaque mass, often surrounded by a narrow radiolucent rim.

Case Details

A 25-year-old male presented with a complaint of a retained tooth in the lower left posterior region. No history of trauma to the oro-facial region, and no swelling or tenderness was noted. Intraoral examination revealed caries in relation to 26, generalized gingivitis, and an impacted 38. CBCT revealed impacted 38 associated with bony hard calcified structure a radiopaque mass encapsulated within the buccal and lingual plates. An excisional biopsy was performed. Grossly, the specimen consisted of multiple hard tissue bits, which were creamish in color.

Histopathology

Gross specimen showing multiple hard tissue bits, creamish in colour. Histopathological Decalcified section showing dental hard tissues arranged in a haphazard pattern, with tubular dentin, enamel matrix/enamel spaces, cementum and pulp-like tissue.

Clinical Significance

The clinical significance of complex odontomas extends beyond their potential for causing local disturbances. They can significantly affect aesthetic and functional aspects of dental health, particularly when occurring in the anterior maxilla, a region critical for cosmetic ap-

pearance and phonetics. Moreover, their potential to alter the normal eruption sequence of teeth can lead to complicated orthodontic problems and may require multifaceted dental and surgical management strategies.

Understanding complex odontomas through the lens of hamartomatous growths not only aids in their diagnosis and management but also highlights the importance of surveillance in individuals presenting with these lesions. Early detection and appropriate management are crucial to prevent long-term sequelae and ensure optimal oral health outcomes.

Clinically, three types of odontoma are recognised: intraosseous, extraosseous and erupted. Thoma and Goldman classified odontomas as follows:

- Geminated composite odontomes-two or more, more or less well-developed teeth fused together.
- Compound composite odontomes-made up of more or less rudimentary teeth.
- Complex composite odontomes-calcified structure, which bears no great resemblance to the normal anatomical arrangement of dental tissues.
- Dilated odontomes-the crown or root part of the tooth shows marked enlargement.
- Cystic odontomes-an odontome that is normally encapsulated by fibrous connective tissue in a cyst or in a wall of cyst.

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Radiograph (CBCT)

Figure 1: CBCT image of the mandibular left posterior region.

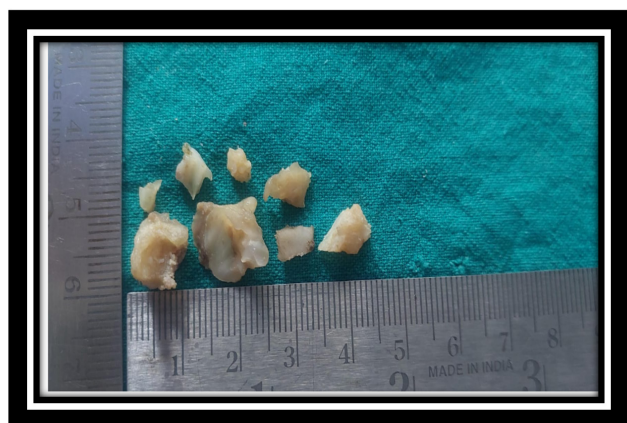


Figure 2

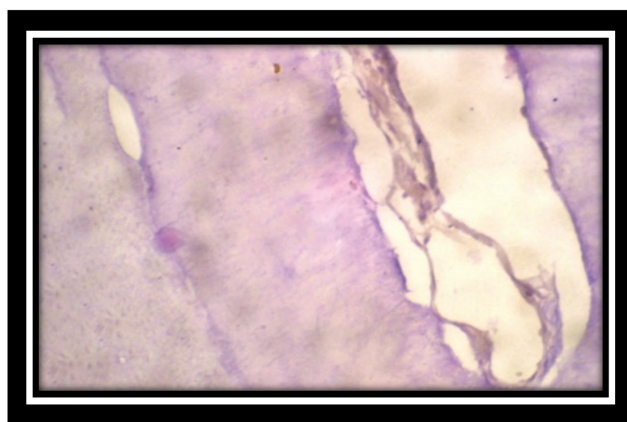


Figure 3

Discussion

Complex odontomas are intriguing odontogenic tumours that have sparked considerable debate regarding their origin. They are generally accepted as developmental anomalies rather than true neoplasms. Theories suggest they result from the growth of completely differentiated epithelial and mesenchymal cells that have undergone an aberrant morpho differentiation. This process is typically linked to genetic mutations or environmental factors such as trauma or infection during tooth development. The odontogenic apparatus's ectomesenchyme components, coupled with odontogenic epithelium, lead to the production of both hard (enamel and dentin) and soft (pulpal) dental tissues in a disorganized array, which is characteristic of complex odontomas. Recent diagnostic advancements have significantly improved the detection and characterization of complex odontomas. The use of CBCT has become particularly pivotal; it provides three-dimensional images that offer superior details about the lesion's size, location, and potential relationship with neighbouring

anatomical structures compared to traditional radiographs. This precision is crucial for surgical planning and can dramatically reduce operative time and complications. Treatment approaches have similarly evolved, with a shift towards conservative surgical techniques aimed at minimizing tissue disruption and preserving dental anatomy. Laser surgery and piezosurgery are examples of such advancements that provide enhanced precision and reduced trauma.

Radiographically, complex odontomas are usually identified due to their distinct mixed radiopaque-radiolucent appearance. The radiopaque part represents the calcified dental tissues, while the surrounding radiolucent halo, which often outlines the odontoma, corresponds to the fibrous capsule or connective tissue. Histologically, these lesions exhibit an anarchic layout of dental tissues. Enamel and dentin are formed, but with no functional alignment. Cementum-like material and pulp tissue may also be present, adding to the complexity of the tissue arrangement. This disordered pattern helps differentiate complex odontomas from other types of odontogenic tumours. The presence of complex odontomas can lead to a range of dental complications, primarily due to their location and size. They can impede the eruption of adjacent teeth, leading to impaction or displacement. Such displacement can result in malocclusion problems and aesthetic concerns, especially if the affected teeth are in the anterior maxillary region. Large odontomas might also exert pressure on surrounding structures, potentially causing resorption of adjacent tooth roots or even contributing to facial asymmetry. Additionally, if left untreated, they may lead to cyst formation or become infected, which could necessitate more extensive surgical intervention.

Correlation of clinical, radiographic and microscopic findings is essential for a definitive diagnosis and to differentiate complex odontoma from other mixed odontogenic lesions [1-18].

Conclusion

Complex odontoma is usually a slow-growing, hamartomata's odontogenic lesion that may remain asymptomatic until it causes delayed eruption/impaction of a tooth. Accurate diagnosis requires clinic radiographic and histopathological correlation. Conservative surgical enucleation/excision is generally the treatment of choice, with a favourable prognosis.

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