

# Compound Odontome: A Rare Hurdle for Orthodontic Extrusion

Aley Mrunal<sup>1</sup>, Jakati Sanjeev V.<sup>2</sup>, Achint Chachada<sup>3</sup>, Atram Harish K<sup>4</sup>

1,3-Reader Orthodontics & Dentofacial Orthopaedics Swargiya Dadasaheb Kalmegh Smruti Dental College & Hospital Nagpur. 2-Lecturer, Orthodontics & Dentofacial Orthopaedics Swargiya Dadasaheb Kalmegh Smruti Dental College & Hospital Nagpur. 4- Sr Lecturer Orthodontics & Dentofacial Orthopaedics Swargiya Dadasaheb Kalmegh Smruti Dental College & Hospital Nagpur.

Correspondence to:  
Dr. Aley Mrunal, Reader Orthodontics, SDKS  
Dental College & Hospital Nagpur  
Contact Us: www.ijohmr.com

## ABSTRACT

Intra osseous malformations other than neoplasm's are mostly originating from the calcifying tissues or due to any dental anomalies which are asymptomatic. Intra osseous malformations can be screened on routine intraoral radiography or extra oral orthopantomogram as radio-opaque calcified masses. These calcified deposits sometimes are well defined & sometimes ill defined due to obstacles of birefringent structures lying in the same plane of vision. This is explained here using a case report of a calcified mass with impacted permanent central incisor which was later diagnosed to be compound odontome in a 4<sup>th</sup> decade of life. The calcified mass was surgically excised.

**KEYWORDS:** Odontome, orthodontic extrusion, impacted tooth

## INTRODUCTION

Growth of differentiated epithelial and mesenchymal cells when affected due to incomplete ameloblastic and odontoblastic mesenchymal activity give rise to tumors / developmental anomalies consisting of enamel and dentin along with variable amount of cementum and pulp tissue. Odontomes are considered as developmental anomalies rather than true neoplasm. By definition odontomes are of odontogenic origin but here in the present report the calcified deposits are along with soft tissues which are of epithelial origin.

Orthodontic Extrusion is a movement done axially in the bone towards the occlusal plane. Usually, tooth moves as per the biomechanics of the force applied, but in the present report, the compound odontome acts as a hurdle for extrusion of impacted central incisor in a 40 year adult patient. This calcified mass required surgical excision of the mass before attempting for extrusion.

## CASE REPORT

A 40 year old male patient reported with missing permanent upper left central incisor. His dental history revealed unerupted permanent left central incisor and patient's family history was noncontributory.

On extraoral examination, the left side of the upper lip was normal (Figure 1). Intraoral examination was also normal. Overlying mucosa in the vestibule was slightly blanched. No inflammation of marginal gingiva and interdental papilla was present.

On palpation, the swelling was found in the vestibule region which was firm in consistency, nontender, fixed to underlying tissue, and was not mobile. (Figure 2)



Fig 1: Pre treatment extra oral photos



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Fig 2: Pre-treatment Intra oral photographs

He had Angles Class I malocclusion. Radiologically the position of permanent central incisor was confirmed in all three planes of space. (Figure 3 & 4)



Fig 3a: Lateral cephalogram

Afer clinical examination, a provisional diagnosis of congenitally impacted central incisor was made.



Fig 3b: Lateral cephalogram and orthopantomogram

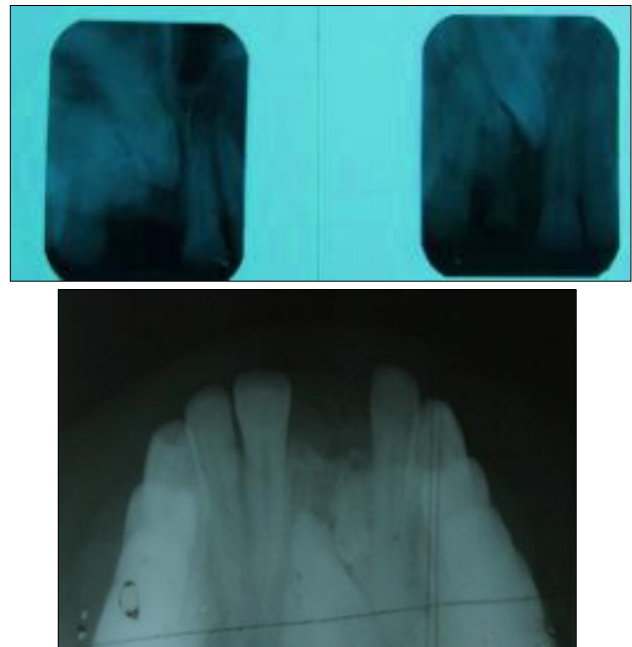


Fig 4: Pre treatment intraoral periapical and occlusal radiographs

The objectives for the case were decided:

- Surgically creating access to central incisor,
- Orthodontic extrusion of the central incisor

The orthodontic management was a routine procedure involving<sup>1</sup>

- Bonding of appliance (MBT 0.022 slot) in upper arch followed by insertion of rigid stainless steel wire with modification at the site where a tooth has to be extruded.
- Surgical opening of the impacted tooth was followed by bonding on impacted tooth and applying traction on the tooth to be moved occlusally connecting to base arch wire.
- Surgical closure of flap elevated in tunnel technique pattern to allow movement of impacted tooth through the tunnel on application of force.

Hence the surgical access was created to the central incisor, and orthodontic extrusion was attempted by applying traction. (Figure 5). But the tooth showed initial movement for some weeks (Figure 6) followed by failure of the bond of the bracket adhered to the impacted left central incisor. On Rebonding & reapplying the traction, again within a couple of times, it showed bond failure. (Figure 7)



Fig 5: surgical exposure of impacted tooth and closure in tunnel/ closed eruption technique

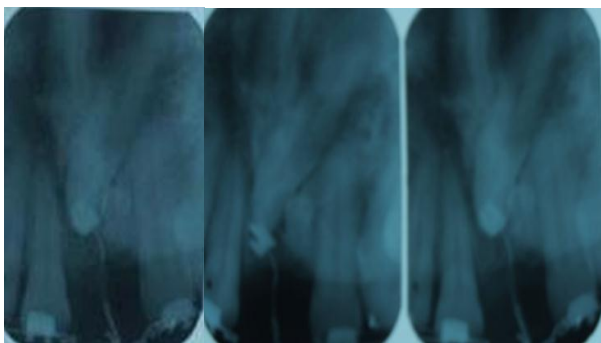


Fig 6: Progressive tooth movement seen radiographically

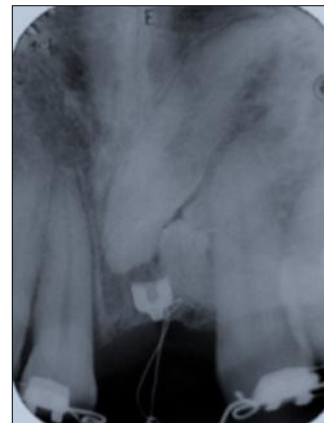


Fig 7: Bond failure during orthodontic traction

Hence we tried to explore the reason for this bond failure. This inhibition was further investigated radiographically. (Figure 8) IOPA of left & right upper central incisor showed impacted central incisor. On examination of IOPA revealed irregular calcified masses present occlusal & labial to the impacted central incisor. These calcified irregular masses were separated in a few areas by a narrow radiolucent band with a smooth outer periphery which was in the path of extrusion of the permanent upper left central incisor. Perpendicular to this there was another triangular mass which was also radiopaque. Surgical exploration of these calcified masses was done & sent for histopathological labs to reveal the anomaly to be a tooth like structure which we commonly identify as an odontome.

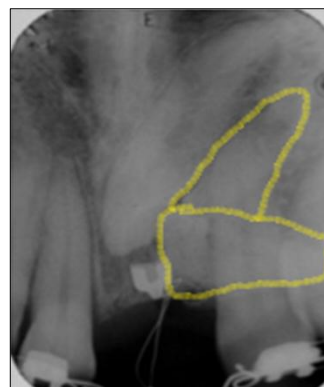


Fig 8: Critical inspection of peri apical radiograph

## TREATMENT PLANNING

The site was surgically explored, and the complete calcified mass was removed from the path of extrusion of the central incisor. The odontome measured around 1cm in length, and they were two in number placed perpendicular to each other. (Figure 9 & 10). Bony margins were smoothed & irrigated with povidone-iodine solution, and flap was placed back and held in position with help of 3-0 silk sutures After this the patient didn't turn up for the extrusion of impacted tooth, neither did he turn up for a prosthesis in that region & he still has space in that region.

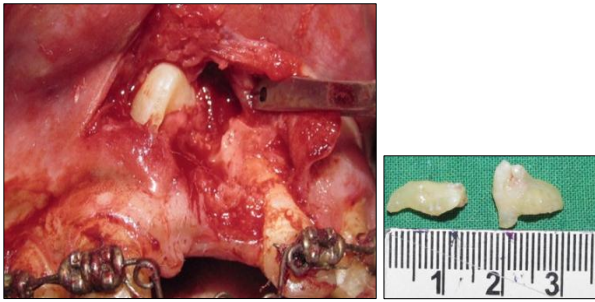


Fig 9: Surgical Exploration showing calcified mass, when debrided two mass of odontome were discovered. Histologically it was confirmed that it is compound odontome of particulate type.

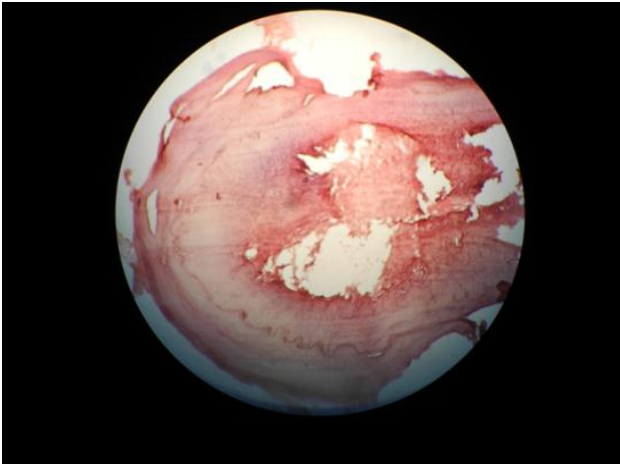


Fig 10: Photomicrograph of compound odontome

## DISCUSSION

Paul Broca who used the term "odontoma" for the first time in 1867 defined it as tumors originating by the overgrowth of transitory or complete dental tissues. Most common location for impacted teeth associated with odontomes is anterior maxilla.<sup>3,4,5</sup>

World Health Organization (1992) classified odontomas as:<sup>2</sup>

- Compound odontomas
- Complex odontomas

The exact etiology of odontome is unknown. However here in this case report the patient gave a history of trauma in early childhood which lead him gradually to the development of intraosseous calcified mass which was reported in the 4<sup>th</sup> decade of his life. When the dental follicle in the developing stage disintegrates due to trauma, these disintegrated tissues undergoes histomorphodifferentiation at different sites which forms calcified matrix along with soft tissue & gets occupied at affected sites in the arch.

The factors to be considered while extrusion or occlusal movement of any impacted tooth are<sup>6</sup>;

- The anatomical location of the impacted tooth
- The prognosis of the impacted tooth to its favorable position.
- The biomechanical considerations of Intra arch mechanics favoring vectors of impacted tooth movement towards the occlusal plane.
- Detail visual inspection of the radiograph for any lesion (especially calcified mass) associated in the vicinity of a surgical site before surgical exploration or in the path of movement of impacted tooth to be moved.
- Patient compliance.
- Complications associated with the surgical exploration.
- Esthetic considerations for attached gingival for impacted tooth to be moved to a new location before raising the surgical flap.

## CONCLUSION

This case report alarms / cautions the clinician during extrusion of any impacted tooth, especially in the upper anterior region. The incidence can occur in the fourth decade of life also & not necessarily to be reported only in the first two decades of life. Thus if such clinical situation arises instead of landing in an erroneous decision to directly go for extrusion of impacted tooth, The path of extrusion for impacted tooth should be clinically & radiographically assessed for the desired tooth movement. Surgical exploration for successful extrusion for impacted tooth in orthodontics should be based on the clinical situation raised along with the carefully done diagnosis.

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