

## An Unusual Case of Feline Bite Induced Odontome in a Four Year Child

Apurva Mishra\*, RK Pandey and Heena Chopra

Department of Paediatric and Preventive Dentistry, King George Medical University, India

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\*Corresponding author: Apurva Mishra, Department of Paediatric and Preventive Dentistry, Faculty of Dental Sciences, King George Medical University, Lucknow-226003, UP, India, Tel. no: 91-9935868311, Email: apurvamishra7@gamil.com

### Abstract

A four year old male child presented with a history of cat bite induced dental trauma. This resulted in loss of primary maxillary left central incisor; intrusion of primary maxillary right central incisor and hard swelling in the labial gingiva in the region of primary maxillary right lateral incisor and canine. Routine radiographs revealed the presence of multiple calcified masses in relation to the primary maxillary right lateral incisor and canine. The treatment included surgical removal of the tooth like structures under local anaesthesia to prevent any further harm to the growing tooth bud. Histopathology confirmed the presence of compound odontome. There has been no episode of recurrence at one year follow up period. The most damaging sequel of injuries to primary teeth is their effects on the developing permanent teeth. Therefore the management of injuries to primary teeth should aim for minimizing harm to the permanent tooth buds.

**Keywords:** Animal bite; Odontome; Trauma; Primary tooth

### Introduction

Trauma in the primary incisors is common with a prevalence ranging from 11.0% to 47.0% [1,2]. The close anatomical proximity of the primary tooth to the developing permanent tooth germ places the permanent dentition in a precarious position especially during injuries to the primary dentition. Traumatic injuries to the primary teeth during the stages of odontogenesis of the permanent tooth germ can severely affect the permanent tooth. The developmental disturbances of the permanent teeth related to trauma to their predecessors have a prevalence that ranges from 20% to 74% [3-10]. The sequelae in permanent teeth after a traumatic episode are greater when the tooth germ is in initial stages of development and after severe traumatic injuries like avulsion or intrusion. One rare but serious after effect can be odontome like malformation of the tooth germ. Odontome occur more often in permanent dentition their association with the primary teeth is very rare [11,13].

Odontomes are considered to be developmental anomalies (hematomas) rather than true neoplasms. They result from the growth of odontogenic epithelium and mesenchymal cells which transforms to ameloblasts and odontoblasts. A fully developed odontome consists mainly of enamel and dentin and varying proportions of pulp and cementum [14,15]. Complex odontome

appears as an irregular calcified mass which histopathologically exhibits well-formed but amorphous disorderly arranged dental tissues. Dental tissues in compound odontomes are arranged in orderly pattern, arranged as small tooth like structures. Majority of compound odontomes are located in the anterior region of the maxilla while the complex odontome are located in the posterior region. The present case report aims to illustrate a case presenting with odontome formation in primary dentition after feline bite induced trauma.

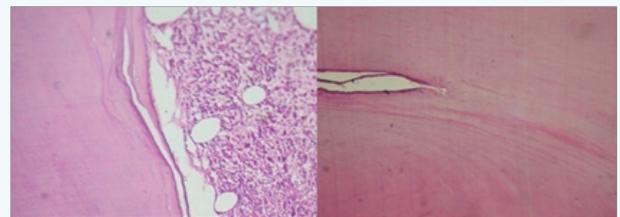
### Case Report

A 4 year old healthy male child presented to the outpatient department of Paediatric and Preventive Dentistry with chief complaint of painful swelling in the upper right front tooth region since six months. History revealed an incidence of cat bite 1.5 years back. The assault occurred when the child was asleep in the backyard. The father rescued the kid on hearing his yelling. He was rushed to a primary health centre where initial wound management was done; bleeding was arrested and wounds addressed. The parents reported that the patient had bruises on his cheek and a wound on the upper lip that bled profusely. The patient's medical history was unremarkable. Intraoral examination revealed swelling in the labial gingiva in anterior maxilla extending from the midline to the primary maxillary

right first molar. The trauma had led to the avulsion of primary maxillary left central incisor and intrusion of the primary maxillary right central incisor (Figure 1). Intraoral periapical radiographs and CT scan revealed numerous calcified tooth like structures in relation to the roots of primary maxillary right lateral incisor and canine (Figure 2A,2B). The primary maxillary right central incisor was intruded and primary maxillary left central incisor was missing. A provisional diagnosis of compound odontome was made. Surgery was planned to remove the odontome like mass under local anaesthesia. Altogether seven mineralised tooth like structures in different developing stages were found (Figure 3). Three were removed from the primary maxillary right central incisor region and four from above the primary maxillary canine region. The intruded primary maxillary right central incisor was removed. Overzealous exploration was avoided to prevent damage to the developing tooth buds. Postoperative oral and written instructions were provided to the parents. The patient was put on regular follow up. The removed specimens possessed tooth like morphology and varied in size from between 0.5 to 1 cm. Histopathological examination confirmed the presence of compound odontome (Figure 4A,4B). One year post surgery it was verified using intraoral radiographs that no lesion had recurred. The patient has been on review for 1 year now and there has not been any evidence of recurrence of swelling (Figure 5,6A,6B).



**Figure 3:** Seven calcified structures removed from primary canine and molar region



**Figure 4A:** H & E stained section of Odontome at 40 X shows dentin and matrix formation.

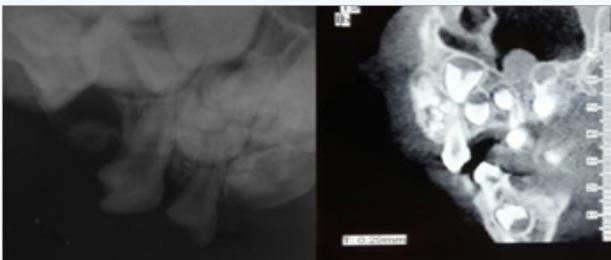
**Figure 4B:** H & E stained section of Odontome at 40 X shows LS & TS of dental tubules.



**Figure 1:** Pre-operative intra-oral photograph.



**Figure 5:** Post-operative intra-oral photograph after a year follow up.



**Figure 2A:** Pre-operative radiograph depicting calcified mass in maxillary right primary canine region.

**Figure 2B:** Pre-operative CT scan of maxillary right primary canine region.



**Figure 6A:** Post-operative radiograph of maxillary right primary canine region.

**Figure 6B:** Pre-operative OPG after a year follow up.

## Discussion

Odontome is a condition which often goes unrecognised and is not detected until clinical symptoms like pain, swelling, impacted teeth are present or is incidentally detected on routine radiographic examination [16]. The exact cause of odontome is unknown, however previous dental trauma and infection have been found to be associated with its formation. In the present case either trauma to the developing tooth bud or infection resulting from the cat bite could be the etiological factor. Feline bites are associated with high risk of poly-microbial infection and small deep wounds. This might have initiated proliferation of epithelial and mesenchymal cells leading to development of odontome. But we can only speculate about this, there is a paucity of literature to support this claim. Andreason [17] described an odontome, like malformation of the permanent tooth germ due to intrusion or avulsion of the primary teeth. According to this theory, an axial force to the primary tooth is transmitted to the permanent tooth bud causing extensive damage. The malformation occurs during the early phase of odontogenesis and affects the morphogenetic stages of the ameloblastic development of the permanent tooth germ. The other etiological factor documented for odontome formation is the detachment of a portion of a tooth germ from the enamel organ or hert wig epithelial roots health [18].

In humans, there is a tendency for the lamina between the tooth germs to disintegrate into clumps of cells. The persistence of a portion of lamina may be an important factor in the etiology of complex or compound odontomes. Levy BA suggested trauma as an etiological factor in an experimental study conducted on rats [19,20]. As the permanent central incisor calcification is not complete till 4 years of age, the above theories can explain the findings in the present case. Kaban [21] states that odontomes are easily nucleated and adjacent teeth which may have been displaced are seldom harmed since a bony septum separates them. In the present case, diagnosis was made early in the primary dentition period owing to the evident and painful swelling. This prompted for immediate treatment, preventing the chances of an impacted or displaced permanent teeth. Surgical excision was feasible because the lesion was close to the incisal edge of the permanent maxillary right central incisor crown so a chance of damage to the incompletely formed root was rare.

## Conclusion

Paediatric dentists play a pivotal role in the treatment as well as the assessment of the psychological impact associated with the traumatic episode on the child. 'Nip the evil in the bud'; early diagnosis and prompt treatment can avert complications like tooth displacement, impacted tooth, non-eruption or delay in eruption which might require a more extensive and tedious treatment planning. It is important that the dentists act prudently to prevent the deleterious sequelae and outcomes of bite injuries.

## Conflict of Interest

None

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