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**Dr. Anuradha Kar Khongsit**

MDS, Senior Resident,  
Department of Dentistry, All India  
Institute of Medical Sciences  
(AIIMS), Gorakhpur, Uttar  
Pradesh, India

**Dr. Shailesh Kumar**

Assistant Professor, Department of  
Dentistry, All India Institute of  
Medical Sciences (AIIMS),  
Gorakhpur, Uttar Pradesh, India

**Dr. Divya Singh**

MD, Assistant Professor,  
Pathology & Lab Medicine, All  
India Institute of Medical Sciences  
(AIIMS), Gorakhpur, Uttar  
Pradesh, India

**Dr. Kamini Kiran**

MDS, PhD Scholar & Oral  
Pathologist, Pathology & Lab  
Medicine, All India Institute of  
Medical Sciences (AIIMS),  
Rishikesh, Uttar Pradesh, India

**Corresponding Author:**

**Dr. Shailesh Kumar**

Assistant Professor, Department of  
Dentistry, All India Institute of  
Medical Sciences (AIIMS),  
Gorakhpur, Uttar Pradesh, India

## Dentigerous cyst with ectopically placed molar tooth below the orbital floor: A case report and review of literature

**Dr. Anuradha Kar Khongsit, Dr. Shailesh Kumar, Dr. Divya Singh and Dr. Kamini Kiran**

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### Abstract

A dentigerous cyst is a pathology of odontogenic origin, that evolves due to the accumulation of fluid between the reduced enamel epithelium layer and the tooth/ crown structure. The incidence of dentigerous cysts is around 1.44 per 100 unerupted teeth. The association of teeth is common. However ectopic position below the floor of the orbit is seldom reported in literature. Diagnosis of a dentigerous cyst is often an incidental finding on routine radiographs as it remains asymptomatic for years. Once diagnosed, it should be routinely intervened as it can cause resorption of the surrounding bone and tooth structure leading to the involvement of vital structures. The incidence of a maxillary third molar in association with a dentigerous cyst is very rare. This is the first case to report the incidence of a dentigerous cyst associated with an ectopically placed third molar below the orbital floor causing resorption of the floor. The possible complications of the case are hypogeous and periorbital infection.

**Keywords:** Dentigerous cyst, enucleation, ectopic tooth, odontogenic cyst

### Introduction

The dentigerous cyst was coined by James Paget, it was initially considered to encompass all the cysts of odontogenic origin. However, in the year 1976 Shear attempted to classify the odontogenic cysts. The World health organization (WHO) reclassifies the pathologies after every 10 years depending on their histopathology and genetic identification. The odontogenic cysts were first classified in the head and neck tumours in the year 1992. The cystic pathologies were eliminated from the classification in the year 2005. The recent update on the 4<sup>th</sup> edition of the WHO series in its ninth volume on Head and Neck tumours in the year 2017, mentions the odontogenic cyst was reincorporated and the odontogenic tumours were reclassified based on the biological behaviour and tumour origin. The objectives of the up gradation of classification were:

1. Simplicity
2. Reproducibility
3. Scientific accuracy
4. Communication in the medical community.

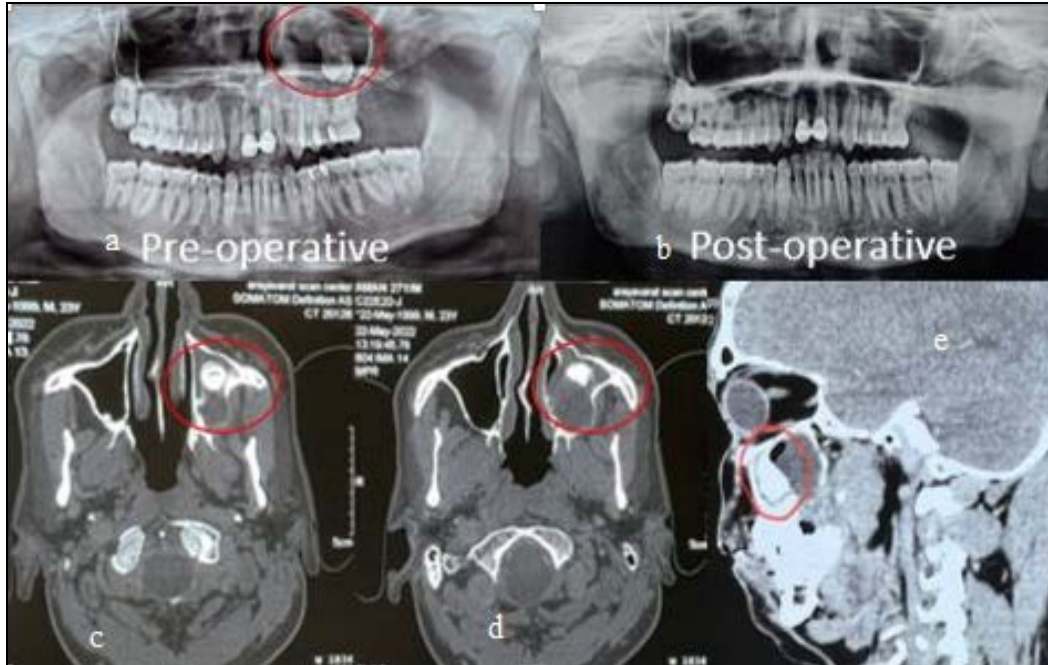
Studies have shown that even though the dentigerous cyst is developmental in origin it is conjectured that the inflammation stimuli such as periapical infection from a non-vital tooth bud can be a cause <sup>[1]</sup>. Generally, dentigerous cyst are asymptomatic and are found as an incidental finding on routine radiographs such as unilocular or multilocular radiolucency associated with a tooth. It is being differentiated from eruption cysts when the peri coronal radiolucency is less than 2.5mm in size when correlated with the age of eruption. The cyst has male predilection and is present mostly at the age of 20- 50 years.

The most common location for impacted teeth in descending order is the mandibular molar, maxillary canine, mandibular canine followed by mandibular premolars <sup>[2]</sup>.

**Case:** A 26 years of Male patient presented to the Department of Dentistry of a tertiary care institute in India with chief complaints of vague pain and salty fluid discharge from the left upper back tooth region for 3 months. He had a previous history of the same for which he has advised extraction on 27, July 2021. After extraction, he was free of any complaints however the pain and salty discharge reoccurred and persisted for a month.

The patient was classified as ASA category I with no underlying comorbidities or allergies. On thorough examination there was no significant Extraoral swelling, no cortical expansion was noted and there was a missing 2<sup>nd</sup> and 3<sup>rd</sup> molar on the second quadrant. The anterior and posterior lateral wall of the left maxilla was intact on palpation with no crepitus. The overlying mucosa was similar to the surrounding tissue. Oral hygiene was satisfactory with no clinical signs of purulent discharge from the 2<sup>nd</sup> quadrant region. On radiographic evaluation, an impacted maxillary 3<sup>rd</sup> molar was seen in the left maxillary antrum below

the floor of the orbit. The Extraoral muscle was intact with intact visual acuity. Bilateral pupils were round equally reactive to light and accommodation with no entrapment signs. A non-contrast computer tomogram was done to thoroughly locate the position of the tooth, for estimation of the amount of bone loss and encroachment into the vital structures (Fig 1. a. b. c. illustrates the CT images of the impacted tooth d. Preoperative OPG X-ray. Figure e. Postoperative OPG X-ray). Fine needle aspiration was done and straw colour fluid was collected.



**Fig 1:** A. b. c. Illustrates preoperative and postoperative OPG X-ray and b, c and d the CT images of the impacted tooth d. Preoperative OPG X-ray

### Surgical procedure

After pre anaesthetic fitness patient was taken under general anaesthesia for cystic enucleation and disimpaction of the molar tooth. The patient was intubated via right nasal intubation. After surgical site preparation and sterile draping, 2% lignocaine with 1:200000 Adrenaline was given as left infraorbital block and posterior superior alveolar nerve block. Through a crevicular incision, a full-thickness mucoperiosteal flap was raised from the 13 to 28 region extending to the maxillary tuberosity, and a releasing incision was placed on the first quadrant to raise a triangular flap. On exposure, it was noted that there was resorption of the posterior lateral wall of the maxilla due to hydrostatic pressure exerted by cystic content. The resorbed window was enlarged with a powered micro motor and handpiece and the cystic lining was identified. The lining was then removed in to along with the impacted maxillary molar. After enucleation of the cystic lining, intraoperative the orbital floor was identified and resorption was noted of the size 1.5mm x 1.5 mm orbital periosteum and orbital fat was seen (Fig 2). The wound was toileted with copious irrigation solution and the antrum was packed with betadine and framycetin ointment pack. The antral pack was removed after 48 hours and was advised sinus regimen. The specimen was sent for evaluation (Fig 3). Histopathological image of Dentigerous cyst a. Cystic lying of the lesion b. The histopathological section shows non-keratinized stratified squamous epithelium with a fibrous cystic wall with cuboidal lining associated with a well-formed third molar tooth confirming the provisional diagnosis made before surgical intervention (Fig 4). The patient was discharged on the

third day after the procedure. The patient was kept under close follow-up for any signs of recurrence. He is free from any symptoms for one year.

### Discussion

Development of a tooth is a well-designed programme from the interactions of cells of ectomesenchymal tissue with the ectoderm. Any alteration of the sequence of tooth formation gives rise to various odontogenic pathologies. The usual causes of ectopic positioning of the tooth are trauma, atypical eruption pattern, and development of the tooth germ in an irregular pattern. Ectopic position of tooth if asymptomatic can remain in their location without any intervention. However, the impacted tooth is often associated with the development of odontogenic pathology which invades into surrounding tissues and causes disfigurement, deformity and discomfort. The most common site for the impacted tooth is the mandibular third molar followed by maxillary canines, thereby liable for its removal<sup>[3]</sup>. According to Toller, the pathogenesis of dentigerous cyst was postulated that the disintegration of the proliferative follicle of an unerupted tooth creates an osmotic gradient which leads to the imbibing of fluid between the reduced enamel epithelium and enamel structure. Depending on the size and morphology of the tooth associated with the pathology, the stage of the tooth development can be predicted as and when the pathology has occurred. Wanjari *et al.* reported a case of multiple complex odontomas associated with dentigerous cysts which depicts that dentigerous cysts can occur at any stage of tooth formation<sup>[4]</sup>. Often odontogenic cysts can cause displacement of the tooth

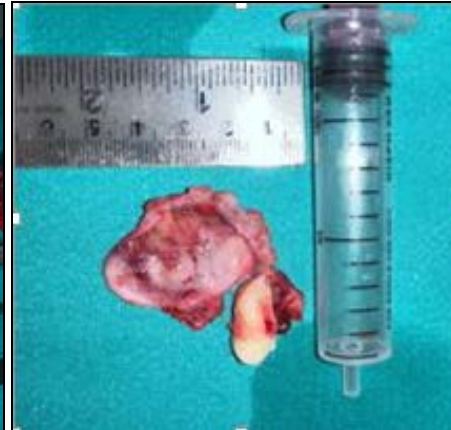
from its usual anatomical position due to pressure. The incidence of the impacted maxillary molar is less and it accounts for 1.9 times lesser than the mandibular third molar tooth [5]. According to a study conducted by Vigneswaran *et al.*, impacted third molar associated with a cystic lesion accounts for 61.4% and also reported that follicular space of < 2.4 mm size also demonstrated pathological tissue [6]. The incidence of dentigerous cysts is around 30% as compared to cases in the mandible which accounts for 70%. The incidence of impacted teeth below the orbital floor in association with dentigerous cysts is rare and not yet documented in the literature. To date, very few case reports have been documented in the literature. In this case report we have enlisted a few similar cases that have

been reported in the literature (Table I).

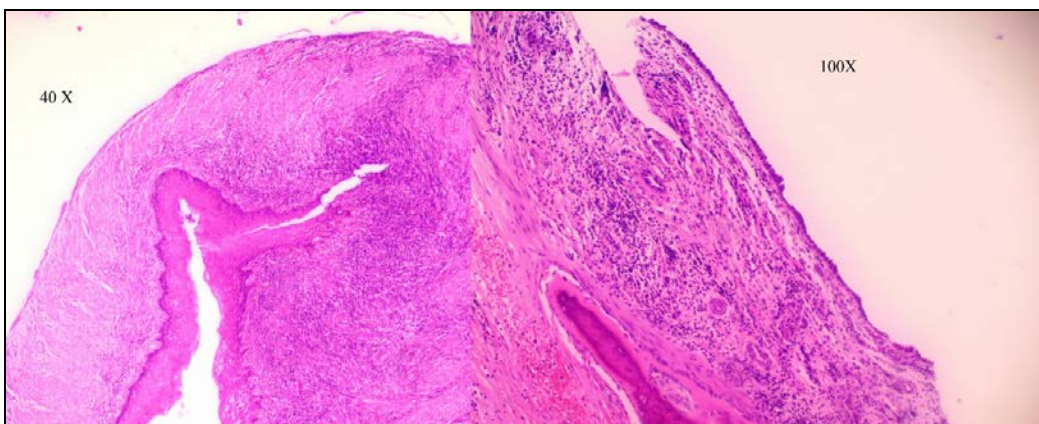
The importance of reporting such cases is the diagnosis, treatment plan, recurrence rate and informed consent to be taken before the procedure, as operating near the orbital floor and its content can cause periorbital infection progressing into cavernous sinus thrombosis due to retrograde infection. Another possible complication that can occur is hypo Globus. Due to the resorption of the orbital floor, the content can prolapse into the antrum which can cause cosmetic deformity. The conventional treatment that is often followed for a dentigerous cyst associated with the maxillary antrum is Caldwell Luc gastrostomy with disimpaction of the associated tooth [14]. This procedure is often safe and easy to perform with limited intricacy.



**Fig 2:** Intraoperative image showing the molar tooth associated with the cystic lining



**Fig 3:** Collected specimen



**Fig 4:** a. Cystic lying of the lesion B. Histopathological section shows non-keratinized stratified squamous epithelium with fibrous cystic wall with cuboidal lining

**Table 1:** Review of literature summarizing the location of ectopic tooth associated with dentigerous cyst and its site of intervention.

Author	Associated tooth	Pathology involved	Location of the tooth associated with the cyst	Site of intervention
Garde <i>et al.</i> , 2012 [7]	Third molar	Dentigerous cyst	Right inferior lateral orbital floor	Intraoral – Caldwell Luc
Shetty Y N <i>et al.</i> , 2012 [14]	Canine and 1 <sup>st</sup> premolar	Dentigerous cyst	below the orbital floor	Intraoral – Caldwell Luc
Rai A <i>et al.</i> , 2013 [8]	Third molar	Dentigerous cyst	Left poster inferiorly to the floor of the orbit	Intraoral – Caldwell Luc
Gupta <i>et al.</i> , 2013 [9]	Third molar		Left inferior medial wall infraorbital rim associated with odontoma	Intraoral – Caldwell Luc
Barbieri <i>et al.</i> , 2017 [10]	Third molar	Dentigerous cyst	Right orbital floor, roots intervened with infraorbital nerve	Functional endoscopic sinus surgery (FESS)
Shetty P <i>et al.</i> , 2018 [11]	Third molar	Odontogenic keratocyst	Left orbital floor	Intraoral – Caldwell Luc
Dhivare <i>et al.</i> , 2020 [12]	Third molar	Dentigerous cyst	Left orbital floor	Endoscopic-assisted Intraoral – Caldwell Luc
Balaji <i>et al.</i> , 2020 [13]	Third molar	Dentigerous cyst	Right orbital floor	Intraoral – Caldwell Luc



## Conclusion

Ectopic tooth eruption is rare and diagnosis of such is important as it is often associated with pathologies. Dentigerous cyst of the maxillary antrum is often quiescent and hence these are often skipped. They are incidentally diagnosed on routine investigation or symptomatic only when secondarily infected. This infection of the can often result in periorbital infections ascending to the brain.

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