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## Manuscript submitted to Case Reports in Dentistry

1 message

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**Case Reports in Dentistry** <jamuna.perumal@hindawi.com>  
To: tania-s@fkg.unair.ac.id

Wed, Feb 23, 2022 at 6:27 PM



Dear Dr. Saskianti,

The manuscript titled " Multidisciplinary Case Management in Mesiodense Impacted Cases with Calcifying Odontogenic Cyst: Case Report" has been submitted to Case Reports in Dentistry by Regina Ayu.

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**Case Reports in Dentistry** <production.a@hindawi.com>

Wed, Aug 3, 2022 at 11:42 AM

To: regina.ayu.pramudita-2019@fkg.unair.ac.id

Cc: alitrahmaestu@gmail.com, nitanomi@gmail.com, udijanto@fkg.unair.ac.id, tania-s@fkg.unair.ac.id, swathy.krishnasamy@hindawi.com, production.a@hindawi.com

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I am pleased to let you know that the third set of galley proofs of your Case Report 4084857 titled "Multidisciplinary Case Management in Mesiodens Impacted Cases with Calcifying Odontogenic Cyst," is ready. You can apply your corrections directly to the manuscript with the Online Proofing System (OPS).

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Reply-To: Swathy Krishnasamy <swathy.krishnasamy@hindawi.com>  
To: tania-s@fkg.unair.ac.id

Mon, Jul 25, 2022 at 6:51 PM

Dear Dr. Saskianti,

Thank you for your email regarding the galley proof of your article "Multidisciplinary Case Management in Mesiodens Impacted Cases with Calcifying Odontogenic Cyst".

I am checking this with the team and let you know as soon as I receive further updates.

Thank you for your patience and understanding.

Best regards,  
Swathy Krishnasamy

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**Swathy Krishnasamy**  
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***Tania Saskianti, DDS., Ph.D., Sp.KGA(K)***

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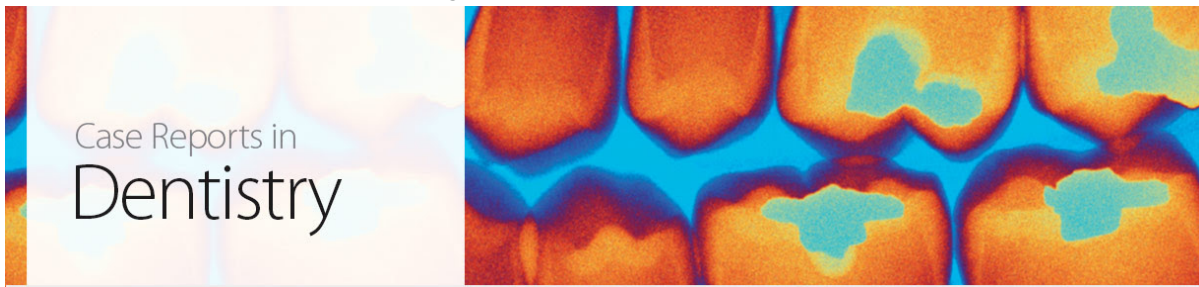
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Sat, Aug 20, 2022 at 11:02 PM

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[Actinomycosis Of The Lower Lip Report Of A Case](#)

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[Novel Management for Severe Odontogenic Maxillary Sinusitis Based on Pathophysiology](#)

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## Manuscripts History

Journal	MS ID	Title & Authors	Last Submitted	Actions
Case Reports in Dentistry	4084857	Multidisciplinary Case Management in Mesiodens Impacted Cases with Calcifying Odontogenic Cyst Alit Rahma Estu, Nita Naomi, Udijanto Tedjosongko, Tania Saskianti, and Regina Ayu	8/3/2022 10:07:59 AM	<a href="#">View Published</a>

## Laporan Kasus

### Manajemen Perawatan Multidisiplin Pada Kasus Impaksi Mesiodens Disertai Calcifying Odontogenic Cyst: Laporan Kasus

Regina Ayu Pramudita<sup>1</sup>, Nita Naomi<sup>1</sup>, Alit Rahma Restu<sup>1</sup>, Tania Saskianti<sup>1</sup>, Udijanto Tedjosaongko<sup>1</sup>, Astrid Bernadette Ulina Purba<sup>2</sup>, Indra Mulyawan<sup>2</sup>

<sup>1</sup>Departemen Ilmu Kedokteran Gigi Anak Fakultas Kedokteran Gigi, Universitas Airlangga, Surabaya, Indonesia

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Jalan Mayjend, Prof. Dr. Moestopo No 47 Surabaya 60132-  
Indonesia Email: [tania-s@fkg.unair.ac.id](mailto:tania-s@fkg.unair.ac.id)

#### ABSTRAK

**Latar belakang:** Calcifying Odontogenic Cyst (COC) merupakan kista yang berasal dari epitel odontogenik, memiliki gambaran khas ghost cell. COC merupakan entitas langka dengan prevalensi 0,3 % dari seluruh kista odontogenik. Sebesar 65-67,5% terjadi di rahang atas anterior dan tidak menunjukkan predileksi jenis kelamin. Lesi terjadi pada kelompok usia yang luas dengan insiden puncak pada dekade kedua kehidupan. Telah dilaporkan bahwa COC dikaitkan dengan gigi impaksi anterior. Secara klinis, COC ditandai dengan pembengkakan asimtomatik, menyebabkan ekspansi ke lingual, migrasi gigi, resorpsi apikal, dan perforasi tulang kortikal. Tujuan dari laporan kasus ini adalah untuk mengevaluasi manajemen multidisiplin COC pada RS Universitas Airlangga, Surabaya.

**Laporan Kasus:** Laki-laki usia 14 tahun datang ke Poli Gigi Anak RSGM Airlangga dengan riwayat gigi patah karena terjatuh 5 tahun yang lalu dan sempat dilakukan perawatan saluran akar. Pasien dikonsultasikan ke Poli Bedah Mulut karena didapatkan gambaran impaksi mesiodens disertai kista di sekeliling gigi impaksi pada pemeriksaan radiologi periapikal. Dalam pemeriksaan radiografis CBCT terdapat interpretasi nampak impaksi mesiodens dengan posisi inverted di bagian palatal gigi 11 dan 21, lesi berbatas jelas radiopak, berbentuk oval dan menyebabkan diskontinuitas dasar cavum nasi. Pasien dilakukan odontektomi gigi impaksi mesiodens dan enukleasi kista, dilanjutkan dengan reseksi apikal gigi yang terlibat, gigi 11 dan 21, dilakukan penutupan dengan MTA. Hasil Histopatologi Anatomi yang diperoleh setelah dilakukan enukleasi kista dan pengambilan mesiodens menegaskan diagnosis berupa COC.

**Kesimpulan:** Perawatan multidisiplin memiliki peranan penting dalam menangani kasus COC secara komprehensif.

**Kata kunci:** Impaksi mesiodens, Calcifying Odontogenic Cyst, Reseksi Apikal, MTA

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## Case Report

### Multidisciplinary Case Management in Mesiodense Impacted Cases with Calcifying Odontogenic Cyst (COC): Case Report

Regina Ayu Pramudita<sup>1</sup>, Nita Naomi<sup>1</sup>, Alit Rahma Restu<sup>1</sup>, Tania Saskianti<sup>1</sup>, Udijanto Tedjosaongko<sup>1</sup>, Astrid Bernadette Ulina Purba<sup>2</sup>, Indra Mulyawan<sup>2</sup>

<sup>1</sup>Departement of Pediatric Dentistry, Faculty of Dentistry, Airlangga University, Surabaya, Indonesia <sup>2</sup> Department of Oral and Maxillofacial, Faculty of Dentistry, Airlangga University, Surabaya, Indonesia

#### *Correspondence:*

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Departemen Ilmu Kedokteran Gigi Anak Universitas Airlangga  
Jalan Mayjend, Prof. Dr. Moestopo No 47 Surabaya 60132-  
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#### **ABSTRACT**

**Background:** Calcifying Odontogenic Cyst (COC) is a cyst originating from odontogenic epithelium, has a characteristic ghost cell appearance. COC is a rare entity with a prevalence of .3% of all odontogenic cysts. 65- 67.5% occur in the maxillary anterior, showing no sex predilection. Lesions occur in a wide age group with a peak incidence in the second decade of life. It has been reported that COC is associated with anteriorly impacted teeth. Clinically, COC is characterized by asymptomatic swelling, leading to lingual expansion, tooth migration, apical resorption, and perforation of cortical bone. The purpose of this case report is to evaluate the multidisciplinary management of COC at Universitas Airlangga Hospital, Surabaya.

**Case Report:** A 14-year-old boy came to the Pediatric Dental Clinic of RSGM Airlangga with history of fracture teeth due to a accident 5 years ago and has been treated with root canal treatment. The patient was referred to the Oral and Maxillofacial Clinic because a mesiodens impaction was found with cysts around the impacted tooth on periapical radiological examination. In the CBCT radiographic examination, there was an interpretation of mesiodens impaction with an inverted position on the palate of teeth 11 and 21, the lesion was demarcated, radiopaque, oval in shape, and causing discontinuity in the base of the nasal cavity. The patient underwent odontectomy for mesiodens impacted teeth and enucleation of the cyst, followed by apical resection of the involved teeth, teeth 11 and 21, and closure with MTA. Histopathological Anatomy results obtained after cyst enucleation and mesiodens collection confirmed the diagnosis in the form of COC.

**Conclusion:** Multidisciplinary care has an important role in treating COC cases comprehensively.

**Keywords:** Mesiodens impaction, Calcifying Odontogenic Cyst, Apical Resection, MTA.

## Introduction

The calcifying odontogenic cyst is an uncommon benign cyst of odontogenic origin, characterized by an ameloblastoma-like epithelium with ghost cells that may calcify, first described by Gorlin et al in 1962.<sup>1</sup>

In 1971, World Health Organization (WHO) defined the lesion as a non-neoplastic cystic lesion and named it as COC. In 1992, WHO classified the lesion as odontogenic tumor, but did not change its name. In 2005, it was renamed as calcifying cystic odontogenic tumor (CCOT). In the new 4<sup>th</sup> edition of WHO classification in 2017, the consensus group classifies the cyst as calcifying odontogenic cyst and the neoplasm as dentinogenic ghost cell tumour. COC is a developmental cyst with odontogenic origin, and constitutes 1.3% of all odontogenic tumors.

Clinically, it is characterized by slowly growing asymptomatic swelling. It may have a central (intraosseous), or less frequently, a peripheral (extraosseous) localization. It may cause lingual expansion, displacement of teeth, root resorption, and perforation in the cortical bone. Radiographically, it may have a unicystic or multicystic well-bordered radiolucent appearance. It may contain irregular radiopaque foci. Nearly half of the cases are associated with an unerupted tooth. It affects maxilla and mandible in a similar rate, and there is not a difference between sexes or races. It often affects the anterior of the first molar teeth. It can be observed in a wide age range, but it is more frequent in the second decade.<sup>2</sup>

## Case Report

A 14-year-old boy came to the Pediatric Dental Clinic of RSGM Airlangga with history of fracture teeth due to accident 5 years ago. [The patient is currently on apexification treatment with ongoing apexification treatment.](#)



Figure 1a: profile view; 1b: intraoral view

Periapical radiographic examination shown tooth 21 with open apex and patient was scheduled for obturation. During treatment, patient felt recurrent pain on teeth 21. On clinical

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- kekurangan metode perawatan COC yg pernah dilakukan sebelumnya (yaitu perawatan cenderung satu2, ndak komprehensif)  
- tujuan perawatanmu  
- keunggulan metode perawatanmu dan mengapa perawatan metode-mu ini penting dilakukan

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Fotonya dicrop, dirapikan jgn mepet, diusahakan ukurannya gak beda jauh

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examination, teeth 21 found with intact temporary restoration, negative percussion and palpation test. Radiograph examination revealed 21 with closed apex and well-defined margin radiolucency area around mesiodens between apical of 21 and 11.



Figure 2a: tooth 21 with open apex; 2b: one year later found apexification material on root canal and closed apex. The impacted mesiodens shown surrounded with cyst between apical of 21 and 11.

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Figure 3: panoramic radiographic view.

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Interpretation of CBCT radiographic examination shown inverted mesiodens impaction on the palate of teeth #11 and 21, the lesion was demarcated, radiopaque, oval in shape, and causing discontinuity in the base of the nasal cavity.

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#11  
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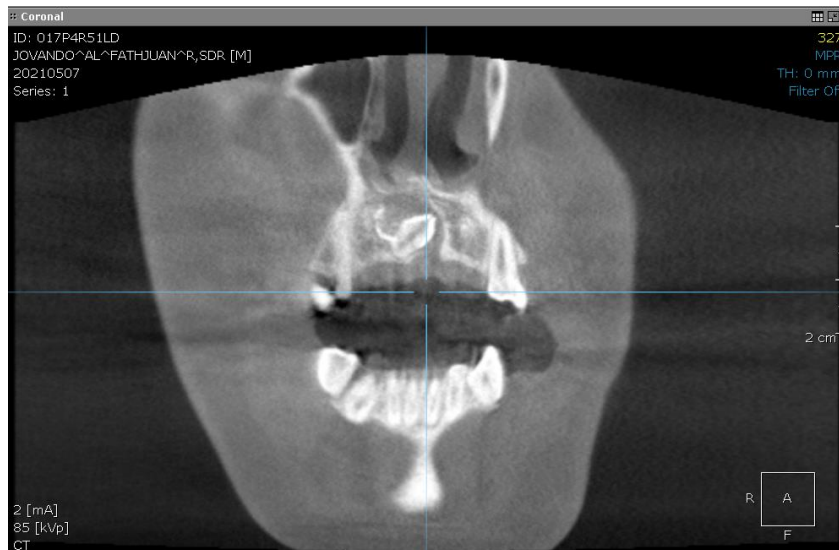


Figure 4: CBCT radiographic view

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## CASE MANAGEMENT??

Treatment was planned with multidisciplinary approach with Oral and Maxillofacial Department under general anaesthesia for odontectomy of mesiodens impacted teeth and enucleation of the cyst, followed by apical resection of teeth involved teeth and closed with MTA plug.

Laboratories assessment and thorax radiographic examination were done prior the procedure and found no negative symptoms. PCR antigen test result was negative. After confirming that the patient is completely anesthetized After general anaesthesia was done, extra oral asepsis procedure was performed with using 70% alcohol 70% and intra-oral asepsis with 10% povidone iodine 10% intra orally. Vasoconstrictor was administered and a full thickness trapezium flap was elevated on periapical area of 12,11,21,22 region. A round carbide bur under constant irrigation for cooling was used to enlarge bony defect to the buccal window to gain access to the periapical lesion and root end of the affected tooth. Needle aspiration test showed mixed of blood and cyst fluid, curettes were then used to remove the soft granulation tissue, which further aided in adequate visualization of mesiodens to ensure complete extraction and no remaining dental follicle. Apex resection was initially planned for teeth 21. However, during operation, the wall of the cyst was found extended to the adjacent teeth and so hence the apex resection was also performed on decided to do an apical resection of teeth #11. The resected root surface was inspected, prepared (dengan alat apa, tuliskan), and then filled with MTA and GIC on the periapical area. Spongostan then applied on the defect area, then sutured with silk Vicryl 4.0.

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Case report menggambarkan kondisi pasien saat datang padamu

Case management menggambarkan pertimbanganmu dalam menentukan rencana perawatan dan proses penatalaksanaannya

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Figure 5-16: extra oral and intra oral asepsis (5), trapezium flap incision (6), flap retraction with rasparatorium (7), buccal window (8), needle aspiration test (9), curettes of granulation tissue (10), extraction of mesiodens (11), apex resection (12), MTA and GIC application (13), evaluation (14), spongostan application (15), suturing (16).

Surgical procedure also included germinectomy of 18, 28, 38, and 48 tooth bud.

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pilih yg penting2 aja. Gambar 1-3 dak usah, spongostan ndak usah.



Figure 17a: post enucleation cyst specimen, 17b: mesiodens, 17c: tooth bud post germinectomy

Histopathological anatomy results obtained after cyst enucleation and mesiodens collection confirmed the diagnosis in the form of COC.

Patient was recalled after one day to access the surgical site **recovery** and found no sign of pain and **showed** good healing. After 7 days post-operative, the suture was removed. Root canal prepared coronal to the MTA placement and obturation of teeth 21 and 11 with gutta percha followed by composite resin restoration was done in regular dental setting. Follow up scheduled at 3 months, 6 months and 1 year to assess clinical and radiographic signs of healing.



Figure 18a: one day post-operative, 18b: composite restoration on tooth 21 and 11



Figure 19: radiographic examination 3 months post-operative

## Discussion

COCs, dentinogenic ghost cell tumors, and odontogenic ghost cell carcinomas form a group of odontogenic "ghost cell" tumors. The term "ghost cells," introduced in 1946 by Thomas and Goldman, highlights the origin and nature of these lesions and describes their microscopic characteristics. COC was first described in 1932 in the work of Rywkind. Then, Gorlin, in 1962, defined COC as a distinct lesion of the calcifying odontogenic tumor. In 2005, the World Health

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Gunakan Bahasa tulisan, pasif, dan ilmiah.  
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**Commented [TS31]:** Showed apa? Tuliskan.

**Commented [TS32]:** Pada diskusi, semua Tindakan yg dituliskan di case management harus diprintili satu2. Kalo bisa dijelaskan masing2 tahapan gunanya untuk apa, reasoningnya apa kok dilakukan hal tsb. Lalu bandingkan dgn case report serupa sebelumnya, apakah ada yg sama perawatannya? Atau malah beda? Sampaikan. Lalu bisa dijelaskan berdasarkan teori knp pendekatanmu beda atau sama.

Hasil perawatan dituliskan detil, scr subyektif dan obyektif.

~~Organization classified COC as a benign tumor. This classification was modified in 2017 in which COC was reclassified among cystic lesions.<sup>3</sup>~~

There is an almost even gender distribution. In Asians, it shows a higher incidence in younger age groups; almost 70% occur in the second and third decades, whereas in whites, only about 53% occur in the respective decades. Moreover, in Asians, the lesions show a predilection for the maxilla (65%), whereas in whites, the predilection is for the mandible (62%). The most common site of occurrence has been the anterior part of the jaws. In the mandible, several cases have crossed the midline, but this is less usual in the maxilla. In our case report, the age of the male patient was 14 years and the condition occurred at the midline region of the maxilla.<sup>4</sup>

The calcifying odontogenic cyst is most frequently radiographically seen as a unilocular translucency with sharply circumscribed edges occurring in the form of a multilocular lesion in a very small number of cases, from 5% to 13%.<sup>4</sup>

Considering to the complexity of the case we decided to manage the mesiodens impacted case with COC multidisciplinary. In our case report, radiographic examination ~~dislosed~~ revealed a solitary well-circumscribed round radiolucency around the impacted mesiodens. A definite diagnosis of calcifying odontogenic cyst can be reliably made on the basis of a histological examination due to the lesion's lack of characteristic clinical and radiological features, as well as its variable biological behavior.<sup>4</sup>

Histological features of the lesion show a fibrous capsule with a lining of odontogenic epithelium. The basal layer is made up of ameloblast-like columnar or cuboidal cells of 4–10 cell thickness. It is covered by loosely arranged epithelial cells bearing similarities to the stellate reticulum of the enamel organ. There are varying numbers of epithelial cells that are devoid of nuclei, eosinophilic, and retain their basic cell outline (ghost cells). These ghost cells can calcify, and calcifications are constant but vary in number.<sup>2,5</sup>

~~In this case,~~ The microscopic view shows sections of cyst wall tissue lined with thin squamous cuboidal epithelium, consisting of round, mononucleated, smooth chromatin cells. The stroma is a fibrous connective tissue with many foci of eosinophilic calcification resembling ghost cells. There were no signs of malignancy.

The recommended treatment for COC in general is total excision in one step. Enucleation associated with curettage is the usual therapy when referring to the cystic variant. ~~So~~Hence, after removing the lesion, a layer of 1 to 2 mm of bone must be removed at the periphery of the cystic cavity.<sup>6</sup>

The patient underwent cyst enucleation, mesiodens impacted tooth odontectomy, periapical exploration of teeth 11, 12 and followed by apical resection of the teeth. Apical teeth 11, 21 were closed with MTA and GIC, and planned orthograde root canal filling for tooth 11 and pulpectomy for tooth 21 after surgery. In addition, germinectomy for tooth bud 18, 28, 38, 48 was also performed under General Anesthesia. General anesthesia was chosen because based on the CBCT interpretation, the lesion was in contact with the floor of the nasal cavity and the patient also required the extraction of the four wisdom teeth.

Obturation of tooth 11 was performed one week after surgery, and was followed by root canal treatment on tooth 21. ~~The patient came 3 months~~ In three-months follow up, after the procedure, and there were no complaints ~~subjectively. Objectively, there were;~~ no signs of swelling, redness, or ~~tooth mobility (tuliskan gigi apa).~~ From the panoramic and periapical X-rays ~~showed , it can be seen that~~ the hermetic filling of teeth 11 and 21. The patient ~~was is~~ scheduled for advised to return for periodic follow-up appointment in 3 months to see if there are ~~still any~~ complaints and signs of healing have formed.

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### Conclusion

Our case represents the classical features of calcifying odontogenic cyst. ~~it comes under category of Type 1(a) simple unicystic type.~~ The comprehensive and multidisciplinary approach is the best way to manage complex cases of mesiodens impaction with COC. A proper diagnostic setup is the starting point to develop an efficient treatment plan.

**Commented [TS35]:** Tambahkan penjelasan kenapa. To relieve symptom and assure total healing.

**Commented [TS36]:** tamb