An Imaging Perspective to Multiple Calcifying Hyperplastic Dental Follicles - A Report of Three Cases

Lizandra Gonzaga Rodrigues, Virgínia Braga da Silva, Juliana de Carvalho Carmelo, Micheline Salim Khouri, Polianne Alves Mendes, Flávio Ricardo Manzi

Department of Dentistry/Oral Radiology, School of Dentistry, Pontifical Catholic University of Minas Gerais, Belo Horizonte, Brazil

Abstract

Rationale: Multiple Calcifying Hyperplastic Dental Follicle (MCHDF) is an extremely rare condition and is characterised by multiple impacted permanent teeth, with enlarged dental follicles, containing calcifications. Cone-beam computed tomography (CBCT) is the ideal exam for the identification of this condition. **Patient Concerns:** The present study seeks to compare the behaviour of MCHDF in imaging exams of three clinical cases with their MCHDF imaging diagnoses, in which a change about tooth eruption was observed. **Diagnosis:** CBCT proved to be an important diagnostic tool for MCHDF, as it is able to identify these small calcifications, as well as measure the size of the follicle. **Treatment Outcomes and Take-Away Lessons:** With a consistent imaging diagnosis, less invasive treatments become a viable option for this condition, since functional and aesthetic involvement is common in these patients, who often tend to be quite young.

Keywords: Cone-beam computed tomography, dental follicle, multiple calcifying hyperplastic dental follicles, tooth impacted

Introduction

Multiple Calcifying Hyperplastic Dental Follicle (MCHDF) is a rare condition characterised by multiple impacted permanent teeth, with enlarged dental follicles, containing calcifications in the inner portions of the dental follicles.[1] The profile associated with this pathology presented a preference for young male patients, more often affecting the mandible, primarily molars and canines, and its aetiology is unknown.[2-4]

In MCHDF microscopy exams, is characterised by the presence of moderately dense fibrous connective tissue, containing numerous foci of calcification and remains of odontogenic epithelia.[5] In radiographs of MCHDF cases, the crown of the unerupted teeth are normally surrounded by a tooth follicle that exceeds 3 mm in diameter with a radiopaque halo in the outer portions, similar to a cyst, and can present radiopaque foci in the inner portions of the dental follicles.[3,6]

When an impacted tooth with an increased follicle is viewed in the radiograph, the dentist should do a cone-beam computed tomography (CBCT), in an attempt to obtain greater details and characteristics of the lesions.[4,7] Since imaging tests are essential for this condition and taking into account how uncommon it is, this study sought to describe the imaging characteristics of three cases of MCHDF and compare how this condition can appear in different patients.

Access this article online

Quick Response Code:

Website: https://journals.lww.com/aoms/

DOI: 10.4103/ams.ams_130_22

Case Reports

Case 1

This 5-year-old male patient, with no systemic alterations, sought out a dentist for a paediatric evaluation. A panoramic radiograph was requested for follow-up on tooth eruption. The image revealed the presence of all of the patient's teeth; however, the absence of radiopacity of the enamel of teeth 36 and 46 were observed. This aspect suggests that the patient presents a hypocalcified amelogenesis imperfecta or enamel hypoplasia. At this moment, no change in the tooth eruption was observed [Figure 1a].

Address for correspondence: Dr. Flávio Ricardo Manzi, Av. Dom José Gaspar, 500 - Eucharistic Heart, Belo Horizonte/MG, CEP 30535-901, Brazil.
E-mail: manzi@pucminas.br

Received: 04-07-2022 **Last Revised:** 24-09-2022
Accepted: 14-10-2022 **Published:** 10-01-2023

How to cite this article: Rodrigues LG, Silva VB, Carmelo JD, Khouri MS, Mendes PA, Manzi FR. An imaging perspective to multiple calcifying hyperplastic dental follicles - A report of three cases. Ann Maxillofac Surg 2022;12:227-30.

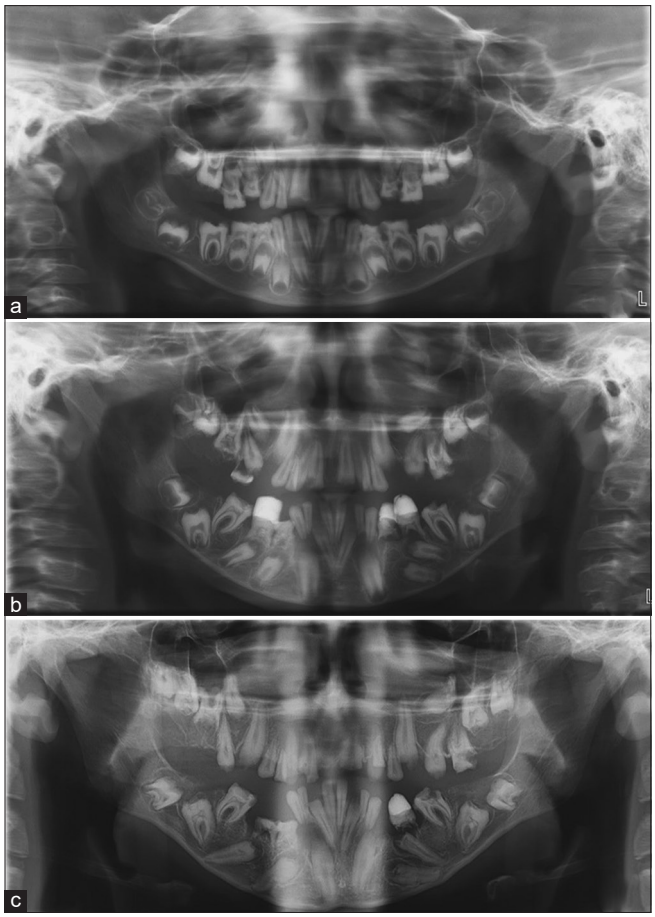

Figure 1: Sequence of panoramic radiographs showing the evolution of impaction of the teeth over 11 years. (a) 5 years. (b) 12 years. (c) 16 years

The second image was performed at 12 years of age, it was possible to observe the impaction trend in most teeth. The increase in the pericoronal space and the presence of calcification areas were observed near the mandibular bicuspid crowns [Figure 1b]. The third radiograph was performed at 16 years of age, confirming the impactation of teeth 15, 18, 24, 28, 34, 35, 37, 38, 43, 44, 45, 47, and 48, with an increase in the pericoronal spaces, with radiopaque areas inside them, confirming the imaging diagnosis of MCHDF. Ankylosis in the deciduous teeth was also observed. It is important to highlight that this patient presented a malformation of the dental enamel in all of his teeth, characterised by the partially circumscribed radiopacity images in the crowns of his teeth, which is typical of Hypocalcified Amelogenesis Imperfecta [Figure 1c].

Case 2

This 14-year-old female patient, with no systemic alterations, undergoing orthodontic treatment. The panoramic radiograph showed an impacted tooth 23, with an increase in the pericoronal space, as well as the tendency toward the impactation of teeth 37, 46, and 47 [Figure 2a]. For a better evaluation, a CBCT scan was requested. In the tomographic slices of the mandibular molar regions of both sides, it was found that the third molars were in formation, while the first and second molars were retained and impacted [Figure 2b-e], with an increase in the pericoronal space and areas of calcification around them; thus, the patient presented a tomographic diagnosis of MCHDF.

Case 3

This 45-year-old female patient, with no systemic alterations and completely edentulous, sought the dentist to continue her prosthetic rehabilitation. A panoramic radiograph was requested to evaluate the intraoral bone condition of the patient. Multiple radiopaque regions were observed, with similar forms of impacted teeth in both the maxilla and the mandible, as well as of four implants in the maxilla [Figure 3a].

For the planning of the case, the patient underwent a CBCT scan. In the maxilla and the mandible, all of the teeth were impacted, with the respective dental follicles increased, with hyperdense areas inside them, also presenting root resorption and the partial absence of periodontal space, compatible with ankylosis [Figure 3b-e]. The increase in the pericoronal space with calcified areas around many of the impacted teeth reveals a typical tomographic diagnosis of MCHDF.

Discussion

The predilection for lower molars in cases of MCHDF is a consensus in the literature.[8] This prevalence is repeated in the three cases presented. In all cases, the mandible and molars were affected. However, in the first and third cases, this change was also observed in the maxilla and in other dental groups.

The patients diagnosed with MCHDF have a well-defined profile of being young and male.[3-5,8] Nevertheless, only one of the three patients reported in this study is male. This deviation standard also occurs when we analyse the age, since the third patient is above the fifth decade of life.

None of the patients reported alterations in family members, making it difficult to define the cause of this anomaly. The most commonly accepted hypotheses in the literature tend to attribute genetic[2] and hormonal[4] causes as the main etiological factors.

In radiographs, the MCHDF lesions are described by a hyperplastic dental follicle, with sclerotic edges, containing radiolucid foci in the inner portion, surrounding the unerupted tooth.[4,5,8] These characteristics are similar to that observed in the panoramic radiograph of the three cases [Figures 1-3].

The CBCT should be requested to bring more details to the analysis.[4,7] However, cases of MCHDF in the literature reporting this type of examination modality are scarce. Studies with CBCT reported impacted teeth associated with hypodense areas, rounded with well-defined edges, containing hyperdense foci, interpreted as calcifications.[3,4] The imaging pattern described in the literature was similar to that found in reported cases [Figures 2 and 3].

Teeth retained for long periods of time can be associated with other alterations.[9] Two abnormalities in the position were observed in these cases: Mesioangulation and distoangulation.

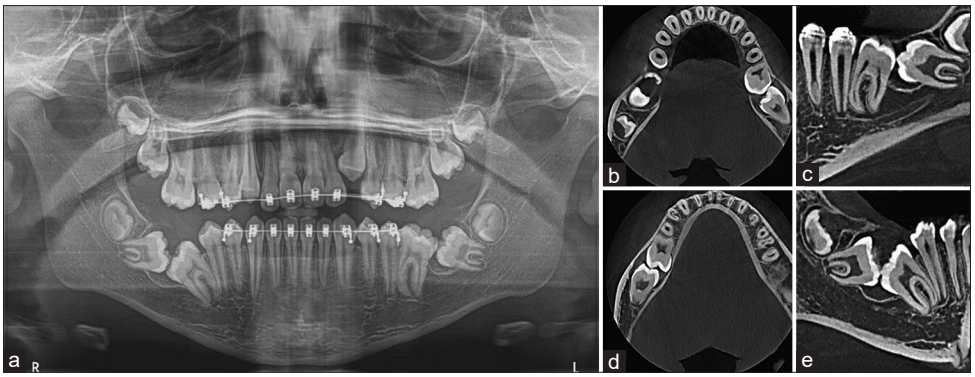

Figure 2: (a) Panoramic radiograph showing the overall condition; (b and d) CBCT axial slice; (c and e) vestibule-lingual CBCT showing the angulated position of the molars, the increase in the pericoronal follicle and small calcifications near the crown of these teeth. CBCT: Cone-beam computed tomography

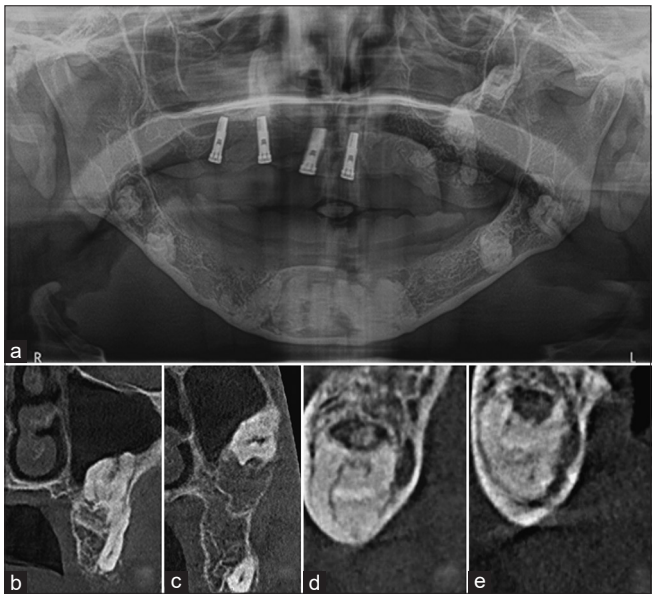

Figure 3: (a) Panoramic Radiograph showing the overall condition; (b-e) CBCT cross-sectional slices, note the presence of impacted teeth compared with that of the altered pericoronal follicle and small calcifications surrounding the crown of these teeth. CBCT: Cone-beam computed tomography

An ankylosis was observed in the first [Figure 1] and in the third [Figure 3] cases, which may be the result of the period of inclusion of these teeth. This finding even further damages the eruption of the tooth.[10]

In the first case, we also observed the diagnosis Hypocalcified Amelogenesis Imperfecta [Figure 1]. It is noteworthy that this is the first case report about the alterations in the structure of tooth enamel with MCHDF in the literature. The presence of supranumeraries was found in the third case; this anomaly has already been associated with MCHDF.[2] The presence of root resorption was also detected in the third case, although there is no correlation between this pathology and MCHDF, this alteration is a common inflammatory response in teeth retained over long periods.[9] Table 1 enumerates important points found in each case.

Table 1: Comparison among the three presented cases

Case	Profile	Prevalence	Complementary imaging exam	Other alterations
1	Male; youth	Maxilla and mandible; molars and pre-molars	Follow-up; panoramic radiograph	Position anomaly; ankylosis; hypocalcified amelogenesis imperfecta
2	Female; youth	Mandible; molars	Panoramic radiograph; CBCT	Position anomaly
3	Female; adult	Maxilla and mandible; all of the groups of teeth	Panoramic radiograph; CBCT	Position anomaly; ankylosis; supranumerary; resorption

CBCT: Cone-beam computed tomography

Therefore, the imaging examinations are essential for the diagnosis and follow-up of MCHDF cases. In a CBCT scan it is possible to observe dental follicles in all dimensions and confirm their hyperplasia, in addition to performing slices in micrometres, generating an image of calcifications, which previously could only be observed in microscopic examinations. With a consistent imaging diagnosis, less invasive treatments become a viable option and should be more widely studied.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

References

1. Gardner DG, Radden B. Multiple calcifying hyperplastic dental follicles. Oral Surg Oral Med Oral Pathol Oral Radiol Endod 1995;79:603-6.

2. Cho YA, Yoon HJ, Hong SP, Lee JI, Hong SD. Multiple calcifying hyperplastic dental follicles: Comparison with hyperplastic dental follicles. J Oral Pathol Med 2011;40:243-9.
3. Aydin U, Baykul T, Yildirim B, Yildirim D, Bozdemir E, Karaduman A. Multiple calcifying hyperplastic dental follicles: A case report. Imaging Sci Dent 2013;43:303-8.
4. Davari D, Arzhang E, Soltani P. Multiple calcifying hyperplastic dental follicles: A case report. J Oral Maxillofac Surg 2019;77:757-61.
5. Ulutürk H, Yücel E, Akinci HO, Calisan EB, Yildirim B, Gizli A. Multiple calcifying hyperplastic dental follicles. J Stomatol Oral Maxillofac Surg 2019;120:77-9.
6. Mesgarzadeh AH, Esmailzadeh H, Abdolrahimi M, Shahamfar M. Pathosis associated with radiographically normal follicular tissues in third molar impactions: A clinicopathological study. Indian J Dent Res 2008;19:208-12.
7. Quereshy FA, Savell TA, Palomo JM. Applications of cone beam computed tomography in the practice of oral and maxillofacial surgery. J Oral Maxillofac Surg 2008;66:791-6.
8. Desai RS, Momin YN, Bansal S, Karjodkar FR. Multiple calcifying hyperplastic dental follicles: A case report and literature review. J Oral Maxillofac Surg 2017;75:1702-5.
9. Sarica I, Derindag G, Kurtuldu E, Naralan ME, Caglayan F. A retrospective study: Do all impacted teeth cause pathology? Niger J Clin Pract 2019;22:527-33.
10. Guarnieri R, Cavallini C, Vernucci R, Vichi M, Leonardi R, Barbato E. Impacted maxillary canines and root resorption of adjacent teeth: A retrospective observational study. Med Oral Patol Oral Cir Bucal 2016;21:e743-50.