Case Report

Concrescence: Cone-Beam Computed Tomography Imaging Perspective

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Received 30 July 2016; Accepted 14 September 2016

Academic Editor: Jjiang H. Jeng

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Concrescence is a form of twinning, formed by the confluence of cementum of two teeth at the root level. The diagnosis of concrescence has largely relied on the conventional 2D imaging. The 2D imaging has inherent limitations such as distortion and superimposition. Cone-Beam CT eliminates these limitations. The aim of this article was to describe a case of dental abnormality using Cone-Beam CT imaging modality. Volumetric data demonstrated confluence of left mandibular third molar with a paramolar, a supernumerary tooth. To our knowledge, this is the second case in the dental literature reported demonstrating the use of Cone-Beam CT in the diagnosis of concrescence.

1. Introduction

Concrescence is a developmental anomaly of the teeth, wherein roots fuse, with no evidence of periodontal space between two or more normal teeth below the cemento-enamel junction. It is caused by a confluence of the cemental surfaces [1–3]. The confluence may occur in between normal tooth and supernumerary tooth [2]. The prevalence of concrescence is reported to be highest in the posterior maxilla [4]. Concrescence classically affects maxillary molars, mostly maxillary second and third molars [4]. According to the latest studies, extracted teeth show frequency of concrescence to be 0.8% in adult teeth and in deciduous teeth to be 0.2–3.7% [5]. Some reported complications of concrescence include periodontal destruction [6]. Extractions of these teeth may be difficult due to large mesiodistal dimensions and could result in the alveolar bone fracture and tooth fracture or can cause sinus opening [6]. Moreover, placement of a rubber dam clamp for isolation during the endodontic procedure could be challenging as well [6]. Various conventional two-dimensional imaging techniques like periapical, bitewing, occlusal, and panoramic radiographs are commonly used in routine dental practices. However, these two-dimensional imaging techniques may pose challenges to diagnostic task

oftentimes because of overlap and superimposition [4]. Cone-Beam Computed Tomography (Cone-Beam CT) was developed in the 1990s and it is an addition to the imaging armamentarium for use in diagnosis. It has relatively low dose compared to MDCT [7–9]. To our knowledge, this is the second case report describing the concrescence dental anomaly in which CBCT imaging was used for evaluation.

2. Case Report

An 18-year-old male's CBCT scan was performed for the evaluation of erupting the third molar. History of trauma was reported 4 months back in the left mandibular region. The CBCT volume was obtained with the CS9300 unit (Carestream, Atlanta, GA, USA) at a private dental office. The parameters used to acquire this scan are 90 Kv, 4 mA, and 9×9 field of view scan. Medium FOV was obtained to evaluate both trauma and dental related abnormality. The DICOM data was sent for evaluation via compact disc. The data was evaluated by board-certified oral and maxillofacial radiologist (SAZ) and volumetric data showed erupting # 17. The distolingual aspect of # 17 exhibited possible supernumerary tooth that appeared to be fused with # 17

FIGURE 1: MPR view showing concrescence.

FIGURE 2: Panoramic radiograph and cross-sectional view proximity of the inferior canal to concrescence tooth.

at the root level (Figure 1). The radiographic impression of concrescence was made. This anomaly could complicate the extraction procedure because of fusion with the root and the proximity of the tooth to the inferior alveolar canal (Figure 2). Additionally, an old fracture line was noted extending from the mid alveolar region in the premolar region (Figure 3). The old fracture shows nonunion and osteomyelitis (Figure 4). The patient was referred for appropriate treatment.

3. Discussion

Tooth related abnormalities include morphological changes such as a change in size, shape, and a number of the teeth [10]. Most of the anomalies are genetic with multifactorial etiology [11]. The most important anomaly associated with a number is supernumerary teeth. Supernumerary teeth may occur as either single tooth or multiple teeth; they may be either unilateral or bilateral and in the maxilla or

FIGURE 3: Panoramic radiograph showing concrescence in the lower left third molar region (green circle); additionally, fracture line (blue arrows) is noted in the premolar region (left side).

FIGURE 4: Axial view demonstrating osteomyelitic reaction.

in the mandible. The most important anomalies of shape are gemination, fusion, and concrescence which could simulate dental twinning anomalies. Concrecence may take place with another tooth or with supernumerary tooth [1, 2]. Concrecence is of two types, true concrecence that occurs during root formation and acquired type concrecence that occurs after root formation is complete [12]. There is no predilection towards any race, age, gender, and primary or permanent teeth [4]. Although it is very difficult to find out the exact etiology for concrecence, local trauma, space restriction during development, excessive occlusal force, or local infection after development may be the suspected causative factors [4]. Concrecence usually

involves posterior maxilla [4]. However, in our case report, it involved mandibular left posterior region. In our case as per patient history, concrecence may be acquired due to trauma. Additionally, clinically detection of concrecence is nearly impossible. There are numerous conventional two-dimensional imaging techniques, having a major limitation such as superimposition or overlap [4]. CBCT would be a powerful adjunct in capturing three-dimensional images [9]. In our case, the practitioner must consider presence of concrecence proximity very closely to inferior alveolar canal and make the appropriate modifications to surgical technique in order to prevent any undesirable surgical complications.

4. Conclusion

This case report illustrates the importance of CBCT 3D imaging technique in evaluating and accurately diagnosing dental abnormalities and the proximity to the inferior alveolar canal.

Competing Interests

The authors declare no competing interests regarding this manuscript.

References

- [1] C. M. Killian and T. P. Croll, "Dental twinning anomalies: the nomenclature enigma," *Quintessence International*, vol. 21, no. 7, pp. 571–576, 1990.
- [2] K. Gunduz, M. Sumer, A. P. Sumer, and O. Gunhan, "Concrescence of a mandibular third molar and a supernumerary fourth molar: report of a rare case," *British Dental Journal*, vol. 200, no. 3, pp. 141–142, 2006.
- [3] M. Sugiyama, I. Ogawa, Y. Suei, H. Tohmori, K. Higashikawa, and N. Kamata, "Concrescence of teeth: cemental union between the crown of an impacted tooth and the roots of an erupted tooth," *Journal of Oral Pathology & Medicine*, vol. 36, no. 1, pp. 60–62, 2007.
- [4] K. J. Gernhofer, "Concrescence of a maxillary second and third molar," *Journal of the California Dental Association*, vol. 37, no. 7, pp. 479–481, 2009.
- [5] L. Law, G. Fishelberg, J. E. Skribner, and L. M. Lin, "Endodontic treatment of mandibular molars with concrescence," *Journal of Endodontics*, vol. 20, no. 11, pp. 562–564, 1994.
- [6] B. Mohan, "Hypercementosis and concrescence of maxillary second molar with third molar: a case report and review of literature," *Oral Health and Dental Management*, vol. 13, no. 2, pp. 558–561, 2014.
- [7] Y. Arai, E. Tammisalo, K. Iwai, K. Hashimoto, and K. Shinoda, "Development of a compact computed tomographic apparatus for dental use," *Dentomaxillofacial Radiology*, vol. 28, no. 4, pp. 245–248, 1999.
- [8] P. Mozzo, C. Procacci, A. Tacconi, P. T. Martini, and I. A. C. Andreis, "A new volumetric CT machine for dental imaging based on the cone-beam technique: preliminary results," *European Radiology*, vol. 8, no. 9, pp. 1558–1564, 1998.
- [9] A. Z. Syed, C. Sin, R. Rios, and M. Mupparapu, "Incidental occurrence of an unusually large mastoid foramen on cone-beam computed tomography and review of the literature," *Imaging Science in Dentistry*, vol. 46, no. 1, pp. 39–45, 2016.
- [10] A. Roychoudhury, Y. Gupta, and H. Parkash, "Mesiodens: a retrospective study of fifty teeth," *Journal of the Indian Society of Pedodontics and Preventive Dentistry*, vol. 18, no. 4, pp. 144–146, 2000.
- [11] R. Miziara, C. Mendes, C. Wiesel et al., "A statistical study of the association of seven dental anomalies in the Brazilian population," *International Journal of Morphology*, vol. 26, no. 2, pp. 403–406, 2008.
- [12] J. S. Khedgikar and S. B. Khedgikar, "Concrescence of a maxillary first and second molar: a case report," *Journal of Medical and Dental Science Research*, vol. 2, no. 1, pp. 1–3, 2015.