tooth #16, which encroached on the pulp chamber. CBCT images of the second case showed the same radiographic appearance involving the unerupted tooth #1. Case 3: A 64-year-old male came for evaluation of the airway. CBCT images revealed an intracoronal radiolucent area involving the impacted tooth #17 with an intact pulp. The involved tooth was asymptomatic in all cases, and no history of trauma was reported by patients.

Results/Differential or Definitive Interpretation:: On the basis of radiographic presentations and clinical findings, pre-eruptive intracoronal resorption was considered the most likely diagnosis. The management of such lesion ranges from no treatment to surgery, surgical exposure, tooth extraction.

The prevalence of PEIR reported on panoramic images in a previous study for both the subject and the tooth were 1.55% to 27.3 % and 0.5% to 2.1%, respectively. The prevalence of PEIR as shown by CBCT in the previous study were 9.5% to 15.1% for subject prevalence and 1.93% to 3.5% for tooth prevalence. The previous study showed that a single tooth was usually affected with PEIR in an individual and that the most commonly affected teeth were the premolars and the molars.

Discussion: PEIR affects the coronal dentin of unerupted teeth. The etiology for PEIR is unknown, and it may be commonly misdiagnosed as dentinal caries because of radiographic similarities. These lesions are usually identified incidentally during radiographic evaluation, and early detection is important for effective management. The diagnosis should be made on the basis of clinical and radiographic findings, and CBCT imaging is a valuable adjunct for early diagnosis.

References

1. Wood PF, Crozier DS. Radiolucent lesions resembling caries in the dentine of permanent teeth. A report of sixteen cases. Aust Dent J. 1985;30:169-173.
2. Seow WK, Wan A, McAllan LH. The prevalence of pre-eruptive dentin radiolucencies in the permanent dentition. Pediatr Dent. 1999;21:26-33.
3. Seow WK, Lu PC, McAllan LH. Prevalence of pre-eruptive intracoronal dentin defects from panoramic radiographs. Pediatr Dent. 1999;21:332-339.
4. Nik NN, Abul Rahman R. Pre-eruptive intracoronal dentin defects of permanent teeth. J Clin Pediatr Dent. 2003;27:371-375.
5. Manmontri C, Mahasantipiya PM, Chompu-Inwai P. Preeruptive intracoronal radiolucencies: detection and nine years monitoring with a series of dental radiographs. Case Rep Dent. 2017;2017:6261407.
6. Al-Batayneh OB, AlJamal GA, AlTawashi EK. Pre-eruptive intracoronal dentine radiolucencies in the permanent dentition of Jordanian children. Eur Arch Paediatr Dent. 2014;15:229-236.
7. Uzun I, Gunduz K, Canitezer G, Avsever H, Orhan K. A retrospective analysis of prevalence and characteristics of pre-eruptive intracoronal resorption in unerupted teeth of the permanent dentition: amulticentre study. Int Endod J. 2015;48:1069-1076.
8. Demirtas O, Tarim Ertas E, Dane A, Kalabalik F, Sozen E. Evaluation of pre-eruptive intracoronal resorption on cone-beam computed tomography: aretrospective study. Scanning. 2016;38:442-447.
9. Demirtas O, Dane A, Yildirim E. A comparison of the use of cone-beam computed tomography and panoramic radiography in the assessment of pre-eruptive intracoronal resorption. Acta Odontol Scand. 2016;74:636-641.
10. Al-Tuwirqi A, Seow WK. A controlled study of pre-eruptive intracoronal resorption and dental development. J Clin Pediatr Dent. 2017;41:374-380.

HEMINASAL APLASIA IN A PATIENT WITH CLEFT LIP: A CASE REPORT

A. TSATALIS, S. KALIM, P.J. TSATALIS, and A. GOHEL, OHIO STATE UNIVERSITY COLLEGE OF DENTISTRY, COLUMBUS, OH

Background: Heminasal aplasia is a rare congenital unilateral malformation of the facial region caused by the failure of embryologic development of a nasal placode. To date, less than 100 cases have been reported globally.

Objective: We report here a case of a 13-year-old female presented for evaluation of a supernumerary tooth with no history of consanguinity or comparable family history of reported findings. The patient had a history of cleft lip repair and cannulation of the right tear duct. The patient exhibited right heminasal aplasia untreated by surgery.

Materials and Methods: Cone beam computed tomography (CBCT) showed complete aplasia of the right maxillary, sphenoid, and ethmoid sinuses.

Results: The right nasal cavity, corresponding nostril, and nasal septum were absent and the right lacrimal duct was only partially formed. Facial asymmetry was noted on an axial view as a depression in the right maxilla. No orbital involvement was noted.

Discussion: The absence of both external and internal ipsilateral structures is inherent to heminasal aplasia. According to Mazzola's classification of frontonasal malformations, this case is classified as an "upper face, half nose" nasal aplasia.

References

1. Mazzola RF. Congenital malformations in the frontonasal area: their pathogenesis and classification. Clin Plast Surg. 1976;3:573- 609.
2. Mladina R, Manojlovic S, Markov-Glavas D, Subaric M. An unusual case of heminasal aplasia: proboscis lateralis or cystic teratoma? J Craniofac Surg. 2003;14:41-45.

DEVELOPMENT OF AN IN VIVO ULTRASOUND PROTOCOL TO STUDY THE MUSCULOAPONEUROTIC ARCHITECTURE OF THE MASSETER DURING MANDIBULAR PROTRUSION AND LATERAL EXCURSION

V. VASSANDACOUMARA, T.I. GHEORGHE, R. LEEKAM, E.W.N. LAM, S.E. PERSCHBACHER, B. LIEBGOTT, and A.M.R. AGUR, ORAL AND MAXILLOFACIAL RADIOLOGY GRADUATE PROGRAM, FACULTY OF DENTISTRY; DIVISION OF ANATOMY, DEPARTMENT OF SURGERY UNIVERSITY OF TORONTO, ONTARIO, CANADA

Background: Temporomandibular disorders (TMDs) affect 5% to 12% of the population and lead to disability and pain. It has been suggested that architectural changes occur in the masseter muscle (MM) in TMDs. However, studies on normal in vivo MM architecture are scarce. Previously, our

laboratory examined MM architectural changes during maximum intercuspation.

Objective: This work is an extension of our earlier studies in that it incorporates border jaw movements. It is hypothesized that a prototype in vivo ultrasonography protocol that will detect MM architectural changes during mandibular protrusion and lateral excursion can be developed.

Materials and Methods: The study was on the development of a prototype in vivo ultrasonography protocol based on cadaveric data.

Results: A protocol was successfully developed by identifying optimal probe positions and sites to visualize the MM laminae in mandibular protrusion and lateral excursion. The development involved correlation of anatomic specimens with in vivo ultrasonography, which enabled quantification and comparison of fiber bundle length, muscle thickness, and aponeurotic height.

Discussion: A novel ultrasonography protocol that will facilitate better understanding of normal MM morphology during mandibular protrusion and lateral excursion was developed. In the future, this protocol could be used as a basis to study MM changes in TMDs.

References

1. National Institute of Dental and Craniofacial Research [7/28/2013]. Facial Pain. Available at: http://www.nidcr.nih.gov/DataStatistics/FindDataByTopic/FacialPain/.
2. Ariji Y, Katsumata A, Hiraiwa Y, et al. Masseter muscle sonographic features as indices for evaluating efficacy of massage treatment. Oral Surg Oral Med Oral Pathol Oral Radiol Endod. 2010;110:517-526.
3. Gheorghe T. An in vivo study of the musculo-aponeurotic architecture of human masseter muscle. Master of Science Thesis. 2018. Discipline of Oral and Maxillofacial Radiology. University of Toronto, Toronto, Canada.

BLOCKCHAIN: A NEW DATA STANDARD IN ORAL AND MAXILLOFACIAL RADIOLOGY?

D. UZBELGER FELDMAN, C.A. TERRY, M.A. BADI, C. YESILSOY, and J. YANG, TEMPLE UNIVERSITY KORNBERG SCHOOL OF DENTISTRY, PHILADELPHIA, PA

Background: Despite the Health Insurance Portability and Accountability Act (HIPAA) efforts, protected health information (PHI) and patient's privacy and safety are still under risk. With exposure of greater than 200 million patients' records for the period 2009−2019, the U.S. government is wondering if enough is being done to keep data safe. Blockchain is becoming a gold standard in health care data management because of its trusted, autonomous, immutable, and secured distributed ledger properties.

Objective: The goals of this retrospective, randomized, double-blind study were to assess (1) the effectiveness of Blockchain patient data conversion, (2) backup storage requirements, and (3) HIPAA compliance, compared with the current data storing and sharing methods and the feasibility of the use of Blockchain in Oral and Maxillofacial Radiology (OMR).

Materials and Methods: Head and neck computed tomography (CT) scans (n = 92,903 files) from the Cancer Imaging Archive (Blockchain folder n = 46,465 and Monitoring folder n = 46,438) and deidentified PHI were randomly assigned by 1 operator. Data were then converted into cryptographic Blockchain hashes via syncing the CBCT scans database folder with the DDSBlockchain (Charlotte, NC, 28,277) folder into the Hyperledger private Blockchain platform by a second operator. Data conversion percentage was assessed, and an F-test Two-Samples for Variances was conducted to quantify data upload speed ($P < .05$). Storing sizes of the original data and the Blockchain data were compared, and sharing privacy and safety were corroborated through the HIPAA compliance checklist by a third operator within the private Blockchain platform.

Results: One hundred percent of data uploaded were converted into Blockchain. Blockchain conversion had an average speed of 0.617 files per second. No statistical difference ($P = .562$) was found when comparing the 2 folders upload speed (average 26 hours, 11 minutes, and 5 seconds). The Blockchain data report storage size was 1.22 MB, whereas the original data folder storage size was 5.36 GB. No HIPAA breach was found during the data upload, conversion, sharing, and storage processes.

Discussion: The Blockchain private platform promises to become a gold standard in OMR PHI data backup because of its data conversion effectiveness, low storage requirements, and trusted, autonomous, immutable, and secured distributed ledger capabilities for keeping data private and safe. Preliminary study results indicated the feasibility of adopting Blockchain in OMR as a new data backup management method.

References

1. Yaga D, Mell P, Roby N, Scarfone K. Blockchain Technology Overview. Gaithersburg, MD: National Institute of Standards and Technology, Computer Security Division, Information Technology Laboratory;2018: Publication NISTIR 8202.
2. Bova C, Drexler D, Sullivan-Bolyai S. Reframing the influence of the Health Insurance Portability and Accountability Act on research. Chest. 2012;141:782-786.
3. Dubovitskaya A, Xu z, Ryu S, Schumacher M, Wang F. Secure and trustable electronic medical records sharing using Blockchain. AMIA Annu Symp Proc. 2017;2017:650-659.
4. Clark K, Vendt B, Smith K, et al. The Cancer Imaging Archive (TCIA): maintaining and operating a public information repository. J Digital Imaging. 2013;26:1045-1057.

DIAGNOSTIC ACCURACY OF APPROXIMAL CARIES IN DIGITAL RADIOGRAPH BY CHINESE AND AMERICAN DENTISTS: AN IN VIVO STUDY

G. LI, and J. YANG, PEKING UNIVERSITY SCHOOL AND HOSPITAL OF STOMATOLOGY, BEIJING, CHINA; TEMPLE UNIVERSITY KORNBERG SCHOOL OF DENTISTRY, PHILADELPHIA, PA

Background: Because dental education system is not the same in both the United States and China, there may be differences between Chinese and American dentists in the radiographic diagnosis of dental lesions.

Objective: The aim of this study was to assess whether there were any differences in the accuracy of diagnosis of approximal caries between Chinese and American dentists.