EVALUATION OF ARTIFICIAL INTELLIGENCE FOR AUTOMATIC TOOTH AND PERIAPICAL PATHOSIS DETECTION ON PANORAMIC RADIOGRAPHY TAMARA VUJANOVIC, AND ROHAN JAGTAP, UNIVERSITY OF MISSISSIPPI MEDICAL CENTER

Objective: To verify the diagnostic performance of a convolutional neural network (CNN) artificial intelligence system for automatic tooth and periapical pathosis detection on panoramic radiography.

Study Design: Patient radiographs were reviewed from EPIC and MiPacs systems at the University of Mississippi Medical Center from June of 2019 to May of 2021. In total, 2113 panoramic radiographs of adults were used to identify periapical pathosis. Images of 218 patients were included. The specific areas of the jaw and teeth associated with the periapical lesions were then determined by a human observer. The CNN-based architecture was analyzed for automatic teeth detection. It was then used to determine whether the periapical pathosis could be detected and if the lesion was detected, where it was located. A manual segmentation and artificial intelligence (AI) (Diagnocat Inc., San Francisco, CA, USA) system was used for analysis.

Results: The CNN system was successful in detecting teeth and periapical pathoses. Only one tooth was incorrectly identified. The AI system was able to detect 203 of a total of 218 periapical lesions. The reliability of correctly detecting a periapical lesion was 93.1%. There was no significant difference between the two measurement methods ($P > 0.05$).

Conclusion: Tooth and periapical pathosis detection performed by humans and by AI systems were comparable to each other. AI systems based on deep learning methods can be useful for detecting teeth and periapical pathosis on panoramic images for clinical application.

Statement of Ethical Review: Human/Animal subjects were used and this study was approved by an institutional ethics panel.

MILLED PREMOLAR CROWN MARGIN DEFECT DETECTION USING MULTIPLE VERTICAL X-RAY ANGULATIONS DWIGHT RICE, LUIZ CARVALHO, RYAN BECKER, MATHEW KATTADIYIL, AND UDOCHUKWU OYOYO, LOMA LINDA UNIVERSITY

Objective: To compare the effects of different vertical x-ray angulations during radiographic imaging on the ability to detect marginal discrepancies of lithium disilicate crowns.

Study Design: Seven lithium disilicate crowns were fabricated on a premolar. Discrepancies ranging from 0 to 300 μm were intentionally created. The seated crowns were imaged using seven different vertical x-ray angulations, totaling 49 images. Thirty evaluators scored each image for marginal discrepancy and values were statistically analyzed.

Results: Significant differences in the ability to accurately judge marginal discrepancies were observed for the study factors of vertical x-ray angulation and marginal discrepancy size ($P < 0.001$).

Conclusion: The radiographic interpretation of the marginal discrepancies of lithium disilicate crowns are significantly affected by vertical x-ray angulation and size of the margin discrepancy.

Statement of Ethical Review: Ethical review was sought and study was exempted from ethical review.

PREVALENCE OF MAXILLARY AND MANDIBULAR EXOSTOSIS IN THE MISSISSIPPI POPULATION: A RETROSPECTIVE STUDY LANDON WILSON, DALTON SNYDER, JASON GRIGGS, AND ROHAN JAGTAP, UNIVERSITY OF MISSISSIPPI MEDICAL CENTER

Objectives: The objective of this study was to determine the prevalence of exostosis in the Mississippi population in order to provide dental health providers in Mississippi the most up to date and accurate data. There are large discrepancies in statistics regarding the prevalence of maxillary and mandibular tori from across the globe. The goal of this research project is to gather more data specifically from the Mississippi population in order to have more accurate figures regarding exostosis in this region of the world.

Material and Methods: Patient data was reviewed from the EPIC and MiPACS systems from January 2018 to May 2021. Specifically, intraoral photographs and panoramic radiograph were examined in MiPacs for exostosis. A code in EPIC was also used to find patients with exostosis in the patient database. A patient was included in the study if they presented with either maxillary or mandibular exostosis or both. A patient was excluded from the study if they did not have maxillary or mandibular exostosis. We also recorded the age, gender, and ethnicity of patients who were included in the study. The data gathered from the radiographs, patient codes, and intraoral pictures is currently being divided into categories such as age, ethnicity, and gender.

Results: A total of 1242 patients were examined for the presence of maxillary and mandibular exostosis. In total, 303 patients were diagnosed to have maxillary and/or mandibular exostosis among the Mississippi population with the prevalence rate of 24.4%. Exostosis was seen more in females (57%) compared to males (43%). The highest prevalence of exostosis was seen in Caucasians (71%), African-Americans (23%), and Asians (6%).

Conclusions: High prevalence of exostosis was seen in the Mississippi population.

Statement of Ethical Review: Human/Animal subjects were used and this study was approved by an institutional ethics panel.

DEEP LEARNING FOR IDENTIFYING LESIONS OF THE JAWS IN CBCT VOLUMES: A PILOT STUDY YIING-SHIUAN HUANG,* PAVEL IAKUBOVSKII,** LI ZHEN LIM,*** AND DON TYNDALL*, *UNIVERSITY OF NORTH CAROLINA ADAMS SCHOOL OF DENTISTRY, **DENTI.AI, AND ***NATIONAL UNIVERSITY OF SINGAPORE

Objective: This study aimed to train and validate a deep learning (DL) algorithm in the detection of radiolucent jaw lesions in CBCT volumes.

Study Design: CBCT volumes from 12 different scanners were acquired retrospectively from the UNC Adams School of Dentistry and Peking University School and Hospital of Stomatology. FOV ranged from $6 \times 6 \times 6$ to $17 \times 17 \times 13$ cm. CBCT volumes contained either zero or at least one intraosseous