Review of: "Deep learning based diagnosis for cysts and tumors of jaw with massive healthy samples"

Kenichrio Ishibashi[1]

1 Aichi Gakuin University

Potential competing interests: The author(s) declared that no potential competing interests exist.

I believe that this is the important study that suggests that additional learning on a pretrain model with healthy panoramic radiographs may improve the performance of deep learning model for the clinical images even when the target disease is small.

However, several points are not fully explained.

There is no explanation of the features of dataset, such as the site of the tumor or cyst, age, gender. In Figure 5 of this study, the target disease is only on mandible. If authors create deep learning model using the cases only with the cyst or tumor on the mandible, this study included far more cases with lesions in the mandible than the other three studies, such as Ariji et al., Kwon et al. and Yang et al. In generally, the performance of the deep learning model usually depends on the amount of the dataset. Therefore, it is possible that the improvement in performance in this study may be attributed to the larger number of cases compared to the other three studies.

What are the target patients for healthy panoramic radiographs? I also think there are ethical issues with taking radiographs of truly healthy patient.

In Table 7, there is a lack of explanation as to whether the performance results are for lesion or healthy panoramic radiographs.

In my opinion, although this study is compared to three other studies, the importance of the pre-training model using 9500 healthy panoramic radiographs is revealed by comparing the performance of 5-class classification and binary classification between with and without the pre-training model using 9500 healthy panoramic radiographs. Therefore, I would like to know the results of learning models without pre-train models for 5-class classification and binary classification.

Discussion

The tumors and cysts are easily misclassified, which is consistent with the clinical diagnosis. Odontogenic tumors and cysts do not reveal their distinct radiological characteristics until they reach a certain size. Early radiological appearances of odontogenic cysts and tumors are so indistinguishable from each other that even experienced oral and maxillofacial

specialists are unable to guarantee their diagnosis results.

The above sentences in line11 page 7 require a reference or an actual radiologists' diagnostic accuracy rate to be provided and compared with the learning model.