

AI System Helps Physicians Classify Oesophageal Lesions



Japanese researchers testing an artificial intelligence (AI) system found that it could classify oesophageal squamous cell carcinoma (OSCC) with higher accuracy, sensitivity, and specificity than endoscopists.

Oesophageal cancer (OC) is the sixth most common cause of cancer-related death worldwide, with OSCC as the most common subtype, accounting for 80% of all OC. Late-stage OSCC has a poor prognosis, so earlier detection favours better clinical outcomes. Narrowband imaging and blue laser imaging equipment-based image-enhanced endoscopy are now the standard of care for diagnosis, but the accuracy suffers from interobserver variability. Using an AI system as a support tool could improve endoscopists' classification accuracy and reduce the number of images needed to classify lesions. However, its performance needs evaluation in a realistic setting.



Thus, the research group evaluated how much a proprietary deep learning-based AI system can improve endoscopists' performance in a situation simulating clinical diagnosis to achieve this aim. The AI training sets consisted of OSCC images captured at Osaka International Cancer Institute, Fukuoka University Chikushi Hospital, and Niigata University Hospital between December 2005 and June 2019 and noncancerous lesions taken at Osaka International Cancer Institute between January 2009 and June 2019. The AI then was validated on videos of suspected OSCC taken from December 2019 to July 2020 at the Osaka International Cancer Institute (147 lesions with 83 cancers). The AI system's performance was compared to that of 19 endoscopists with an average of 12 years of experience that also evaluated the validation set. All predictions were confirmed by biopsy.

The accuracy, sensitivity, and specificity for the OSCC classification were 80.9%, 85.5%, and 75.0% for the AI system, and 69.2%, 67.5%, and 71.5% for the endoscopists. The AI system even correctly diagnosed cancers missed by over 70% of the endoscopists. Given its higher sensitivity and specificity for cancer, the AI system could be developed into a clinical decision support tool to provide a higher quality of diagnosis.

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Source: [Scientific Reports](#)

Published on : Wed, 27 Apr 2022