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Summary

DIAGNOSTIC PERFORMANCE OF AN ARTIFICIAL INTELLIGENCE MODEL FOR PREDICTING HIGH-RISK PHARYNGEAL AND ESOPHAGEAL SQUAMOUS CELL CARCINOMA PATIENTS

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Oesophagus

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An AI model analyzing pharyngeal background mucosa images predicted multiple Lugol-voiding lesions in the esophagus with 89.4% sensitivity and was significantly associated with future pharyngeal and esophageal squamous cell carcinoma development over 80 months of follow-up.

KEY POINTS

- The AI model achieved 78.2% accuracy and 89.4% sensitivity for predicting LVL-C (≥10 Lugol-voiding lesions per endoscopic view) when combining white light imaging and narrow-band imaging of pharyngeal mucosa from 298 test cases.
- AI-predicted LVL-C was significantly associated with pharyngeal SCC risk (hazard ratio 12.00, 95% CI 1.56-92.50, p=0.02) and esophageal SCC risk (HR 4.20, 95% CI 1.92-9.16, p<0.01) during median 80-month follow-up.
- During follow-up, 38 of 298 test cases developed pharyngeal SCC and 83 developed esophageal SCC; current alcohol intake was also significantly associated with esophageal SCC risk.
- The approach may offer a non-irritant alternative to routine Lugol's iodine staining for identifying patients at high risk of pharyngeal and esophageal squamous cell carcinoma.

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