

INTRODUCTION

- ❖ **Clinical challenges:** No consensus exists regarding CT features predictive of malignancy in cystic pulmonary lesions.
- ❖ **Aim:** To identify CT characteristics associated with malignancy in Lung-RADS 4A cystic lesions. To evaluate the diagnostic performance of a CT-based radiological model.

METHODS

This retrospective study included patients from two large health care networks (2021-2024) who had surgically resected cystic lesions that were categorized as Lung-RADS 4A. Two radiologists, blinded as to results, reviewed all CT images.

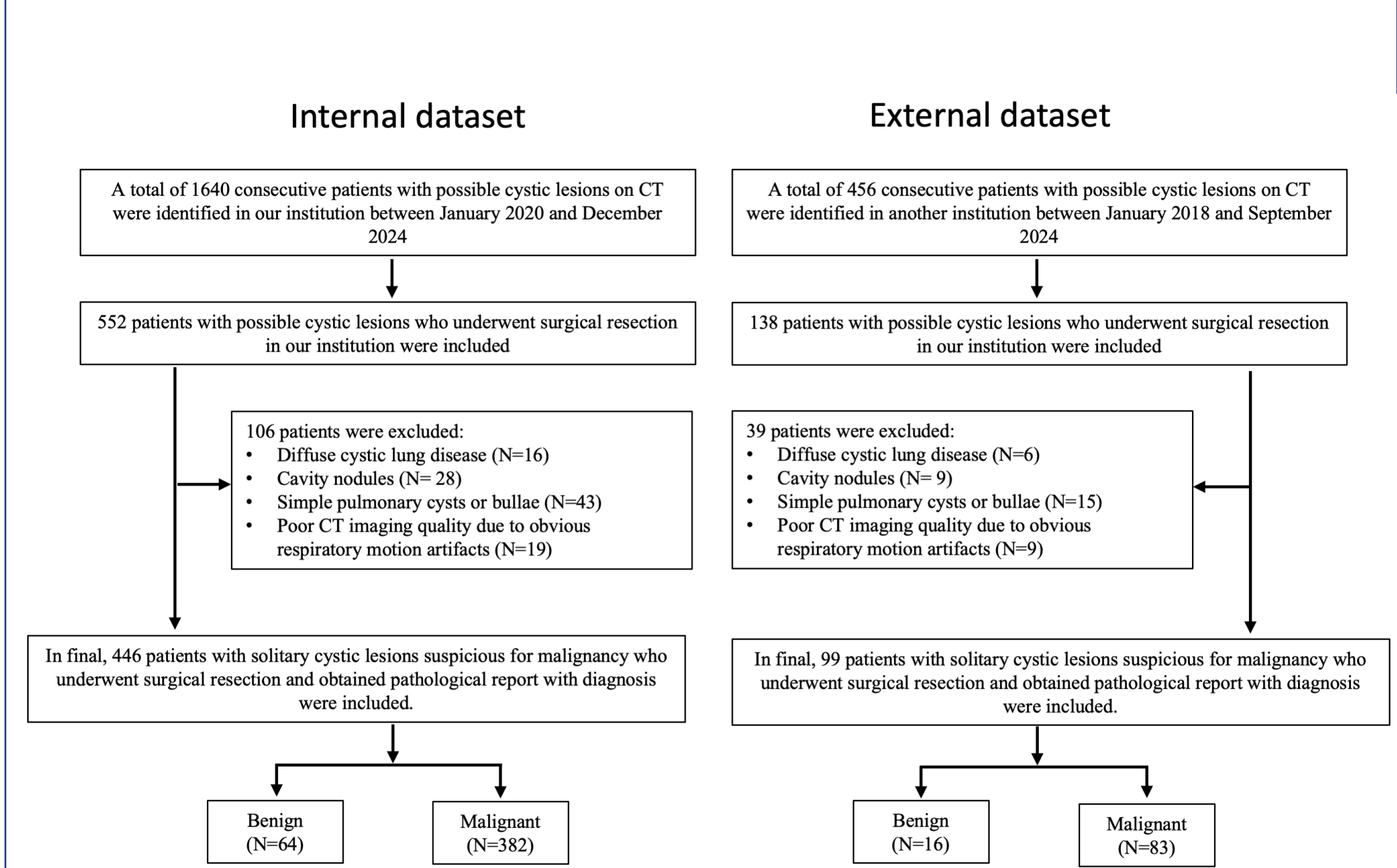


Figure 1: Flowchart of patients selection

RESULTS

- The internal dataset included 446 consecutive patients (297 [66.6%] women; median age, 60 years [IQR, 53–66 years]), while the external validation dataset included 99 patients (65 [65.7%] women; median age, 59 years [IQR, 50–64 years]).
- Wall thickness (OR=1.31, 95% CI: 1.13–1.52), a nonsolid wall component (OR=9.88, 95% CI: 4.19–23.30), and a part-solid wall component (OR=4.93, 95% CI: 2.24–10.83) were significant independent predictors of malignancy.
- The radiological model demonstrated an AUC of 0.80 (95% CI: 0.74–0.86) in the inl dataset and 0.75 (95% CI: 0.56–0.94) in the external validation dataset.
- Mural nodules were present in 111 (24.9%) lesions in the internal dataset and 28 (28.3%) lesions in the external validation dataset; however, no significant difference in the prevalence of mural nodules was observed between benign and malignant cystic lesions (P>.05).

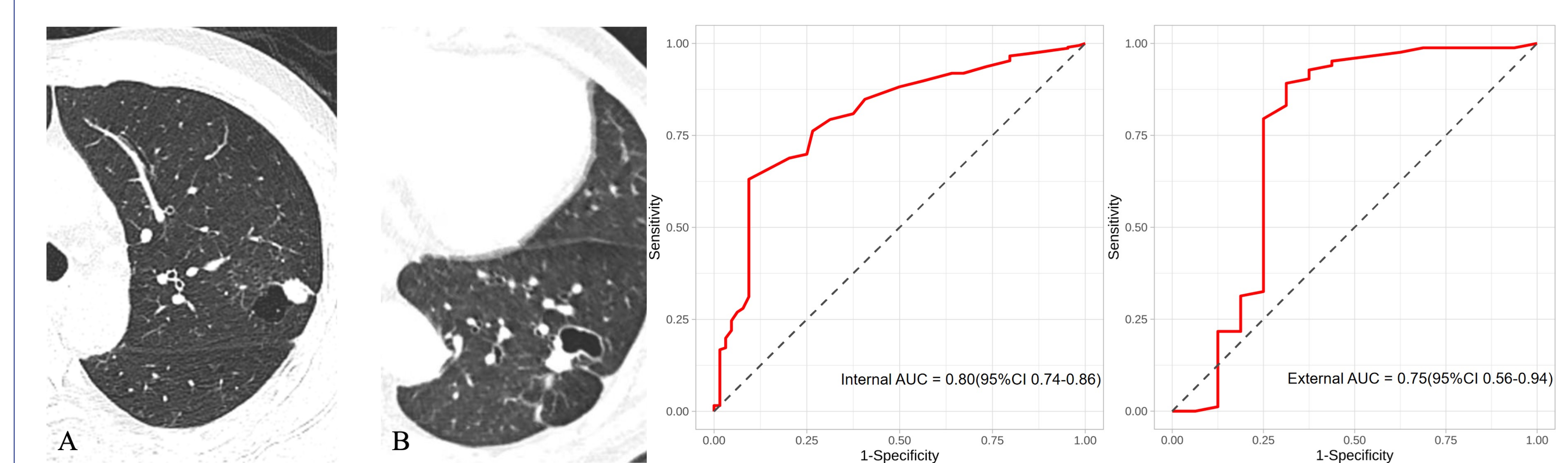


Figure 2. Examples of mural nodule on CT images. A: CT image of a 65-year-old male patient showed an unilocular cystic lesion with an exophytic solid mural nodule (invasive adenocarcinoma). B: CT image of an 83-year-old male patient demonstrated an unilocular cystic lesion with an exophytic solid mural nodule (bronchogenic cyst with infection).

DISCUSSION AND CONCLUSION

- Wall thickness and wall component consistency were independently associated with malignancy in Lung-RADS 4A cystic lesions.
- The CT-based radiological model showed considerable diagnostic performance internally and fair performance in external validation.
- Mural nodules were not significantly associated with malignancy and should not be considered a reliable predictor alone.
- These findings may help improve CT-based risk stratification of cystic pulmonary lesions.

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