

EVERLASTING EVOLUTION
FOR PATIENT-CENTERED CARE



The Korean Society of Radiology

KCR
2024

The 80th Korean Congress of Radiology And Annual
Delegate Meeting of The Korean Society of Radiology

2024. 10. 2. WED - 10. 5. SAT
COEX, SEOUL, KOREA

HOSTED BY THE KOREAN SOCIETY OF RADIOLOGY | www.kcr4u.org

Abstract Book

EVERLASTING EVOLUTION
FOR PATIENT-CENTERED CARE



KCR 2024

2024. 10. 2. WED - 10. 5. SAT
COEX, SEOUL, KOREA

HOSTED BY THE KOREAN SOCIETY OF RADIOLOGY | www.kcr4u.org

CONTENTS

I. General session

Congress Lecture	5
Plenary Lecture & KSR Spotlight Lecture	6
Case-based Review	10

II. Joint Symposium 28

III. AI Scientific Session 89

IV. 전문의를 위한 핵심영상의학 연수강좌 101

V. KSR Program

가치기반 지불체계와 영상학과	137
특수의료장비 품질관리교육	140
RANK-QS: 필수의료와 영상학과	149
AI 규제에 최근 동향	153
Oncologic Imaging	157
DRLs across Asia	161
MRI safety	167
Editorial Luncheon	171
Asbestos Related Pleuropulmonary Diseases	173
Visionary Education Session	177
What's New Session	184
RINK-CR	188
RINK-CR (AI)	192

VI. Luncheon Symposium 196

VII. Subspecialty Session

	Special Focus Session & Refresher Course & Multidisciplinary Team Session	Invited Lecture & Scientific Session	Informal Scientific Presentation & Scientific Exhibition
Abdomen	201	391	583
Breast	228	417	634
Cardiovascular	239	433	651
Chest	249	447	677
Genitourinary	270	464	704
Image-guided Tumor Ablation	276	478	718
Intervention	280	483	719
Musculoskeletal	302	492	733
Spine	338	505	759
Neuroradiology	343	511	767
Head & Neck	356	544	803
Neurointervention	362	548	822
Pediatric	371	553	826
Thyroid	385	564	850
Others		569	857

AB	Abdomen	AI SS	AI Scientific Session
BR	Breast	AS	Asbestos Related Pleuropulmonary Diseases (석면관련질환의 영상판독교육)
CV	Cardiovascular	CBR	Case-based Review
CH	Chest	CL	Congress Lecture
ER	Emergency	CRP	Core Radiology Course for Physicians (전문의를위한 핵심영상의학 연수강좌)
GU	Genitourinary	IIS	Image Interpretation Session
ITA	Image-guided tumor ablation	IJS	Intersociety Joint Symposium
IR	Intervention	JS	Joint Symposium
MS	Musculoskeletal	KMT	KCR Meets Thailand
MS(SP)	- Spine	KSR	KSR Program
NR	Neuroradiology	LS	Luncheon Symposium
NR(HN)	- Head & Neck	MDT	Multidisciplinary Team Session
NR(NI)	- Neurointervention	OS	Opening Session
PD	Pediatric	PL	Plenary Lecture
TH	Thyroid	RANK	RANK-QS
OT	Others	RC	Refresher Course
		RINK	RINK-CR
		RINK(AI)	RINK-CR (AI)
		SS	Scientific Session
		SL	Spotlight Lecture
		SF	Special Focus Session
		VES	Visionary Education Session
		WN	What's New Session

SS 30 CH-10 11:52

Lung Aging Index: Artificial Intelligence Assisted CT Imaging Biomarker for Multi-Disease Correlation

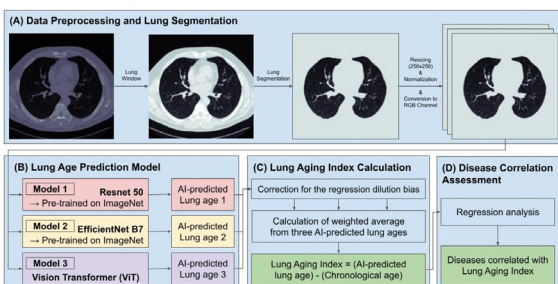
Jaewon Jung¹, Sriya Kappagantu², Audrey Burnett², Xiaowen Yin², Tician Schnitzler³, Jae Ho Sohn³¹Yonsei University College of Medicine, Korea,²University of California Berkeley, USA, ³University of California San Francisco, USA.

jaewonjung0512@gmail.com

PURPOSE: The purpose of this study is to examine the AI-predicted biological lung age as a tool for lung health assessment, exploring which diseases are correlated with the discrepancy between the AI-predicted lung age and the chronological age.

MATERIALS AND METHODS: This retrospective study analyzed two datasets of low-dose chest CT images; 71,928 images from the National Lung Screening Trial (NLST), and 676 images from lung cancer screening at University of California, San Francisco (UCSF). After lung window adjustment and lung segmentation to sharpen the focus on the lung, three distinct deep learning models - Resnet 50, EfficientNet B7, Vision Transformer - were developed to predict biological lung age. We defined the Lung Aging Index as the discrepancy between chronological age and AI-predicted biological lung age, using a weighted average of these models' predictions. To ensure the reliability and applicability of our models in real-world scenarios, we conducted external validation using a dataset from actual clinical settings. Logistic regression analysis was then employed to determine correlations between multiple diseases and the Lung Aging Index, with adjustments for multiple comparisons through Bonferroni correction.

Overview of the Methods Framework



RESULTS: The AI-predicted biological lung age achieved a Mean Absolute Error (MAE) of 0.44 years for the NLST test set and 0.41 years for the UCSF external validation set. Diseases that showed significant correlations with the Lung Aging Index included asbestosis (Odds Ratio [OR] 1.71, 95% Confidence Interval [CI] 1.13 - 2.55, $p = 0.010$), asthma (OR 1.26, 95% CI 1.08 - 1.47, $p = 0.003$), chronic bronchitis (OR 1.25, 95% CI 1.07 - 1.46, $p = 0.004$), COPD (OR 1.75,

95% CI 1.43 - 2.14, $p < 0.001$), emphysema (OR 1.52, 95% CI 1.29 - 1.79, $p < 0.001$), hypertension (OR 1.61, 95% CI 1.47 - 1.77, $p < 0.001$), and stroke (OR 1.39, 95% CI 1.08 - 1.79, $p = 0.009$). After applying the Bonferroni correction, asthma ($p = 0.038$), COPD ($p < 0.001$), emphysema ($p < 0.001$), and hypertension ($p < 0.001$) maintained their significant positive correlations.

CONCLUSION: This study presents the Lung Aging Index as a novel artificial intelligence-assisted imaging biomarker for assessing overall health status. We demonstrate its clinical utility by estimating the difference between ensembled AI-determined biological lung age and chronological age. Lungs appearing older than their chronological age may indicate an unhealthy patient status, correlating with conditions like asthma, COPD, emphysema, and hypertension.

Genitourinary

Adv

10:40-12:00

202

Urogenital Radiologic Issues 01

Chairperson(s)

Sung Kyung Moon *Kyung Hee University Hospital, Korea*Sang Youn Kim *Seoul National University Hospital, Korea*

SS 12 GU-01 10:40

Preoperative Value of Non-contrast-Enhanced Vessel Wall MRI for T3 Renal Cell Carcinoma

Ying Cui, Xin-Gui Peng

Zhongda Hospital School of Medicine Southeast University, China.

xingui2005peng@126.com

PURPOSE: To explore the diagnostic performance of contrast-enhanced computed tomography (CECT), conventional MRI (con-MRI) and vessel wall MRI (VW-MRI) in preoperative assessment of T3 renal cell carcinoma (RCC), and to evaluate the incremental value of con-MRI and VW-MRI.

MATERIALS AND METHODS: In this a single-centre retrospective study, RCC patients with pathological T3 stage from January 2016 to December 2023 were included. patients who did not undergo CECT or con-MRI or VW-MRI scan in our hospital were excluded. Images were independently and blindly evaluated at four-week intervals by three readers. The T stage reported in the pathological report combined with clinical data was used as the reference standard. The incremental value in preoperative staging T3 were