

ATS 2026 Highlights

Respiratory Structure and Function Early Career Professionals

Get to know members of the RSF Assembly

Is your research clinical, basic science or translational?

Clinical.

Tell us about your research?

My research is a 5- radiomics study that investigates whether the fractal dimension (FD) measured from CT images can quantitatively differentiate malignant brain tumors from normal brain parenchyma. CT images were processed with dedicated fractal-analysis software to obtain FD values for radiographically identified tumor regions and corresponding normal-appearing brain, and these were compared statistically. The result of the study supports FD as a quantitative imaging biomarker that can augment conventional qualitative CT interpretation for the characterization and potential risk stratification of brain tumors.

Where do you see yourself in 5 years?

As a radiologist at the beginning of my independent practice, I see myself on a focused path toward becoming a thoracic radiologist, with a strong parallel track in research. I want to deepen my expertise in chest imaging—both oncologic and non-oncologic—and be actively involved in projects that integrate artificial intelligence into radiology workflows, particularly for lung and mediastinal diseases. My goal is to contribute to evidence-based, AI-assisted tools that improve diagnostic accuracy, and access, and to help translate these innovations into real-world clinical practice so they meaningfully advance patient care and healthcare delivery in my setting.

What do you find is the major benefit of RSF Assembly Membership?

The major benefit of RSF Assembly membership is belonging to a focused community that shares an interest in respiratory structure and function, where I can connect with mentors and collaborators, stay updated on emerging science, and participate in working groups and sessions that help shape future research and clinical practice.



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If you or someone you know would like to be featured as an ATS RSF ECP please email Carolyn Wang (carolyn.wang@hli.ubc.ca)

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Association Of Fractal Dimensions Of Brain Computed Tomography Images In Brain Tumor Malignancy: A 5-year Single Center Retrospective Study

Objective: The study aims to determine the association of fractal dimensions of Computed Tomography (CT) scan of brain tumor malignancy in relationship to their biopsy results.

Methods: This Retrospective single-center study included a total number of 36 patients with brain tumors. Review of chart enumerating all records of adult patients who underwent CT scan with corresponding biopsy results from a tertiary hospital from 2018 to 2022 was done. Fractal dimensions were obtained using Fracsoft Version 14 from the CT images of the patients. Cohen d and Wilcoxon test were used to measure the difference between two groups. P-values used to determine the level of significance.

Results: Most lesions were in the left frontal lobe (20%) and in the right frontal lobe (16%). It was observed that the average fractal dimension of a lesioned brain is 1.85 (± 0.00675), which is significantly greater than the normal brain's fractal dimension of 1.70 (± 0.050), $p < .001$, with a Cohen's d value of 2.22 indicating a very large effect size, implying a notable difference in the fractal dimensions between individuals with brain lesions and those with normal brains.

Conclusion: We established that there is a significant difference in the mean fractal dimensions of brains with lesions compared to normal brains. This suggests that the observed difference is not only statistically important but also has practical significance, with the mean fractal dimension of lesioned brains being over 22 standard deviations away from that of normal brains.

Table 2. Location of the Lesion						
	Male n = 14	Female n = 11	Total N = 25			
Frontal						
Left	3 (21.4)	2 (18.2)	5 (20.0)			
Right	1 (7.1)	3 (27.3)	4 (16.0)			
Bilateral	-	1 (9.1)	1 (4.0)			
Parietal						
Left	1 (7.1)	-	1 (4.0)			
Right	1 (7.1)	1 (9.1)	2 (8.0)			
Bilateral	-	1 (9.1)	1 (4.0)			
Occipital						
Left	1 (7.1)	1 (9.1)	2 (8.0)			
Right	3 (21.4)	-	3 (12.0)			
Temporal						
Left	3 (21.4)	-	3 (12.0)			
Right	1 (7.1)	1 (9.1)	2 (8.0)			
Right frontal, bilateral temporal	-	1 (9.1)	1 (4.0)			

Table 3. Difference in Fractal Dimension						
Statistic	p	Mean difference	Effect Size	95% CI		
				Lower	Upper	
Wilcoxon W	111	<.001	0.150 Cohen's d	22.2	15.7	28.3



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