Case Study

Improved coronary Artery Plaque Visualization with Precise IQ Engine

powered by Altivity

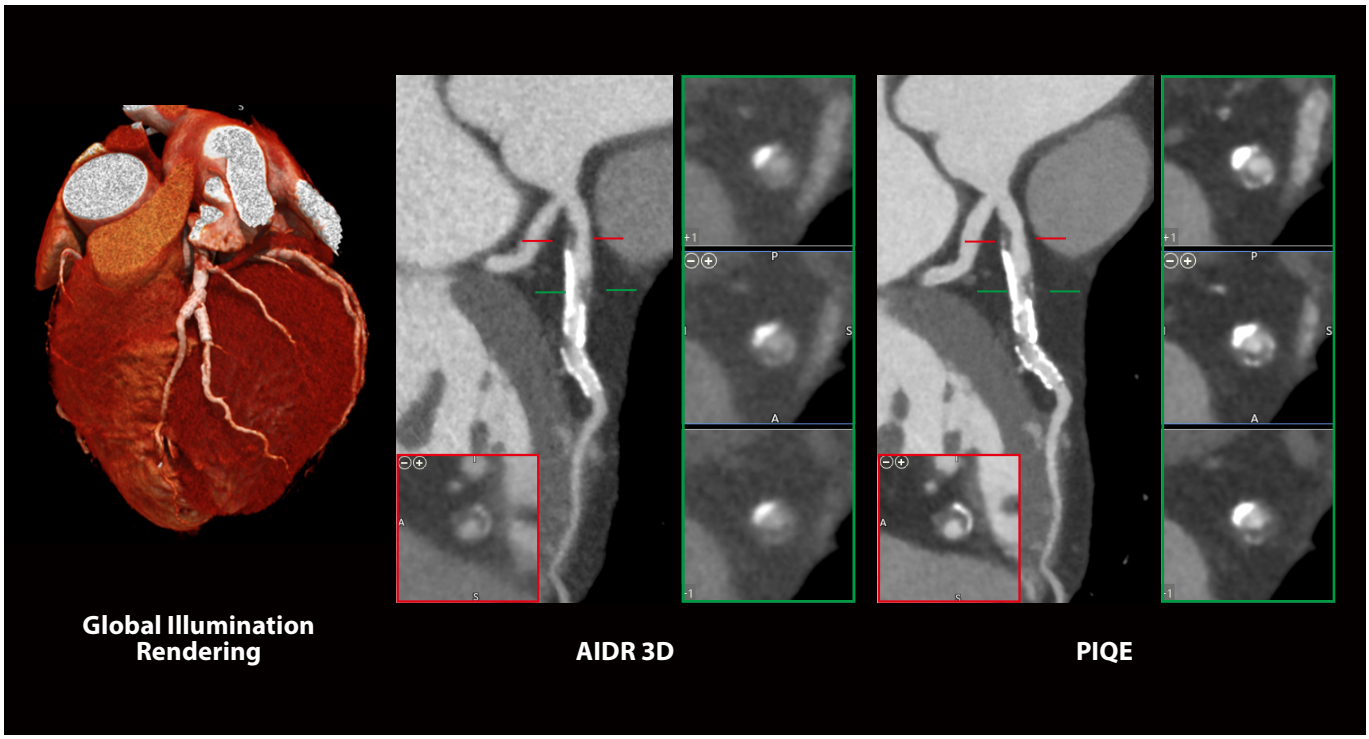
"What I am most impressed with PIQE is its image quality. It has incredible sharpness and detail. The amount of blooming artifact from calcified plaques is minimized with PIQE reconstruction."

Dr. Marcus Chen, MD
NHLBI, National Institutes of Health, USA

Patient History

This 56 year-old-man with BMI 26.2 kg/m^2 and prior coronary stent placement presented with atypical chest pain. He was referred for a Cardiac CTA scan. The images were reconstructed with Precise IQ Engine (PIQE) Deep Learning Reconstruction.

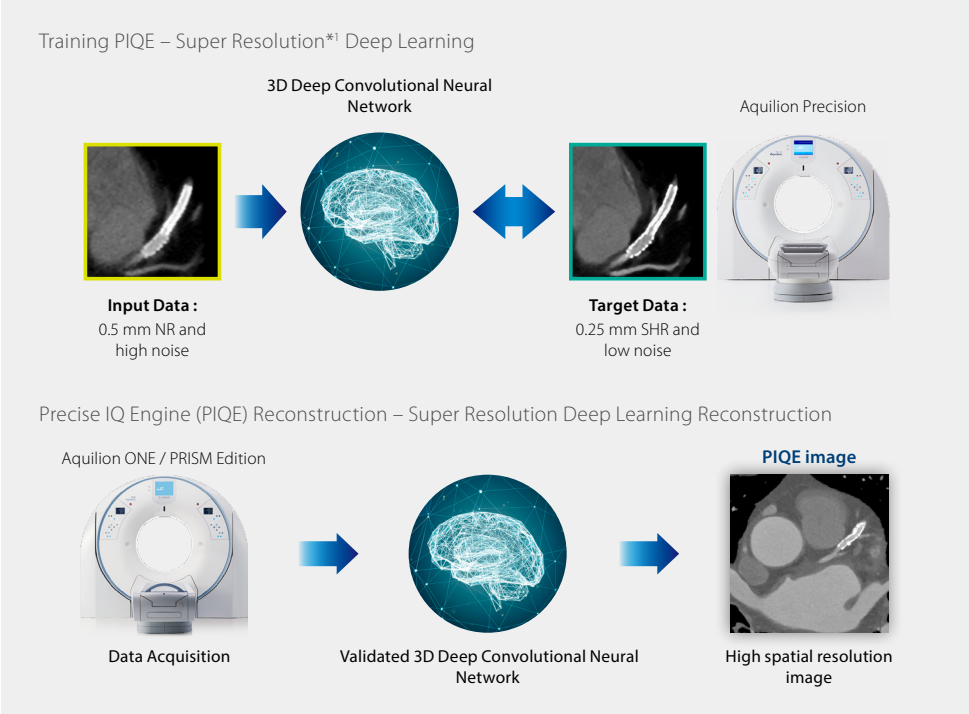
Results



Stents are present in the Left Anterior Descending (LAD) and second diagonal branch. There is significant calcified plaque seen in the Left Main and LAD proximal to the stents. PIQE delivers sharper detail with clearly defined calcified and non-calcified plaque and less blooming from calcium and stents compared to Adaptive Iterative Dose Reduction (AIDR) 3D.

Technology

Precise IQ Engine (PIQE) harnesses the power of Canon's 0.25 mm Aquilion Precision detectors to train the 3D Deep Convolutional Neural Network. This next generation three-dimensional neural network allows PIQE to maximize the inherent spatial resolution of the detector from ECG gated volumetric scans to provide a new level of cardiac CT image quality.



Conclusion

PIQE provides increased spatial resolution for clear visualization of the vessel lumen for improved assessment of in stent re-stenosis. The high contrast-to-noise properties of PIQE exams also provide better evaluation in heavily calcified coronary arteries with no loss of low contrast detectability*2 or increase in radiation dose. In this clinical example, PIQE enabled confident evaluation of the vessel lumen in the presence of calcified and non-calcified plaques and stents.

Acquisition

Scanner Model:
Aquilion ONE / PRISM Edition

Scan Mode:	ECG gated Volume
Collimation:	0.5 mm
Exposure:	120 kV, SURE Exposure
Rotation Time:	0.275 s
CTDI vol:	7.9 mGy
DLP:	103.1 mGy·cm
Effective Dose:	1.44 mSv
k-factor:	0.014 *3

Benefits of PIQE

- Sharper anatomical detail
- Reduced calcium blooming
- No additional dose

*1 Super resolution maximizes the inherent resolution of the detector.
*2 Compared to AIDR 3D
*3 American Association of Physicists in Medicine (AAPM) Report 96, 2008.

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