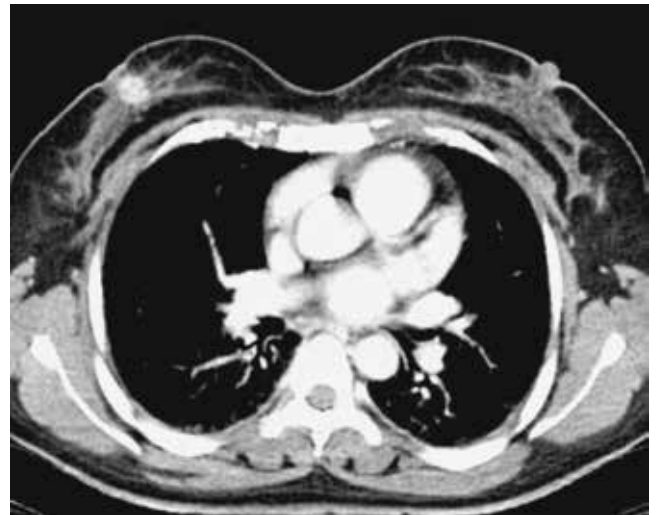
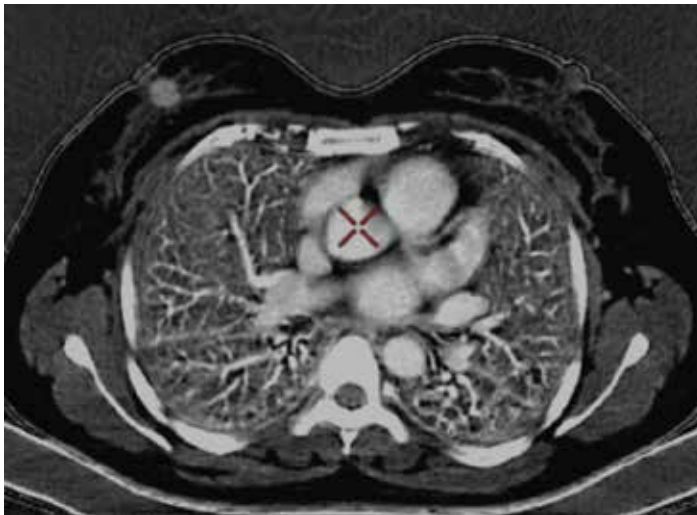


Case study

# Breast Tumor & Lung Metastasis follow up with Gemstone Spectral Imaging (GSI)



Dr. Yavuz Metin MD.  
Radiology Department of  
Recep Tayyip Erdoğan  
University Hospital  
Rize, TURKEY



## About Recep Tayyip Erdoğan University Hospital

- University hospital providing medical treatment & services
- 400 beds, and 9 operation rooms
- 21 clinical & medical technology centers
- Certified by the Turkish Health Authority in 2008

## Patient history

A 35 year old female patient referred with a breast tumor. Addressing the swelling in the right breast and investigating the lung metastasis.

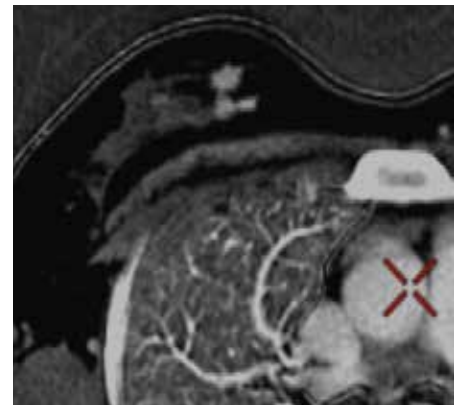
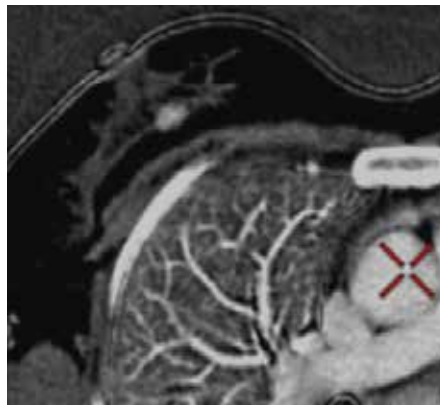
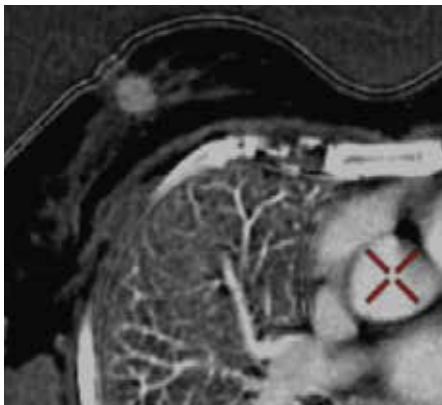
GSI acquisition was performed to assess lung metastasis a delayed acquisition of a hundred and twenty seconds was acquired, using 70cc of contrast.

## Acquisition

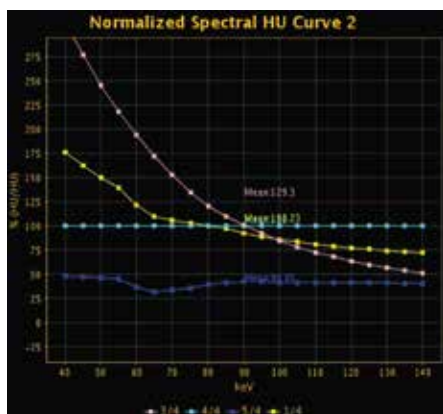
	Chest with contrast
kV	80-140 (ultra-fast kV switching)
mA	275kV
Pitch	1.375
ASiR™	50
Coverage, mm	260
Slice thickness, mm	0.625
Acquisition time, s	4.7
DLP, mGy.cm	250
Effective dose, mSv	4.2
IV protocol	70cc @4cc/sec of 300mg/ml contrast

This breast cancer patient is undergoing a lung CT to investigate metastatic lung lesions; the main purpose is to decrease radiation dose by using GSI technologies on the breast region. Thanks to the virtual monochromatic image reconstruction capabilities of GSI technologies, we were able to easily visualize breast lesions with high accuracy rates.

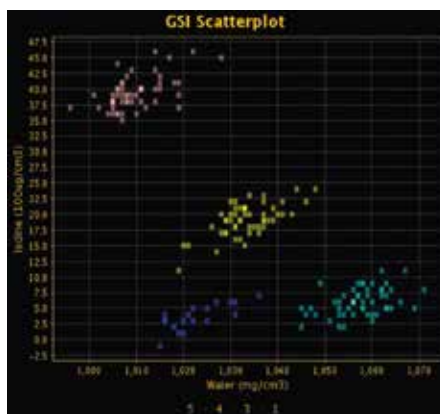
- Dr. Yavuz Metin, MD.



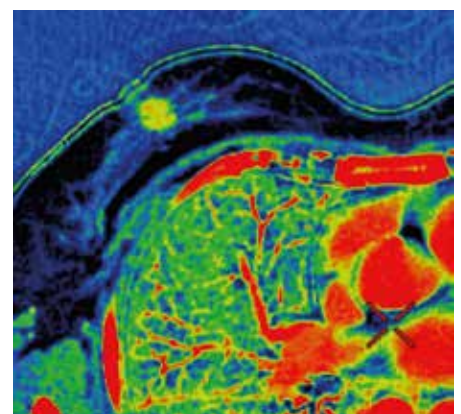
Iodine-Water images (Water Suppressed)



Spectral HU Curve



GSI Scatterplot percentage of the iodine pixels

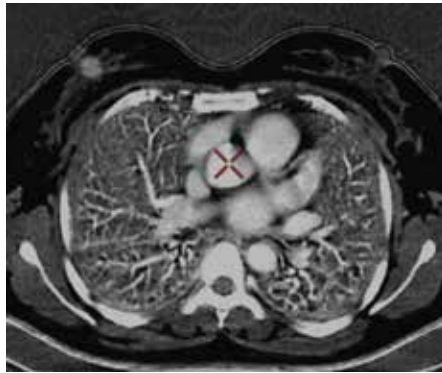


Iodine map (with color overlay)

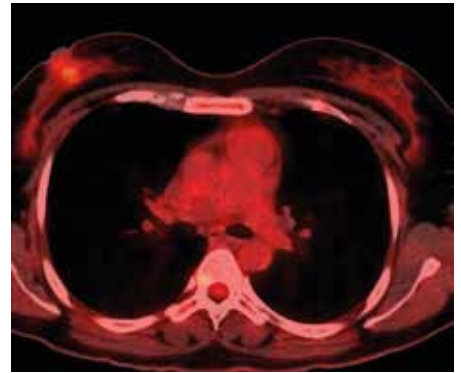
## Results



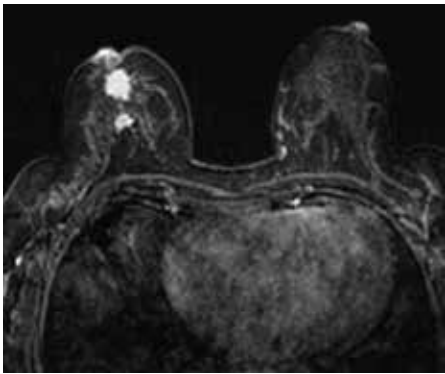
60 keV axial monochromatic view



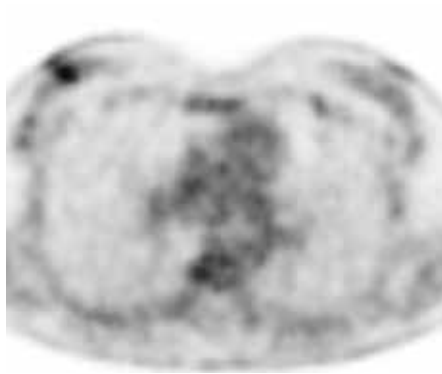
Iodine-Water view (Water suppressed)



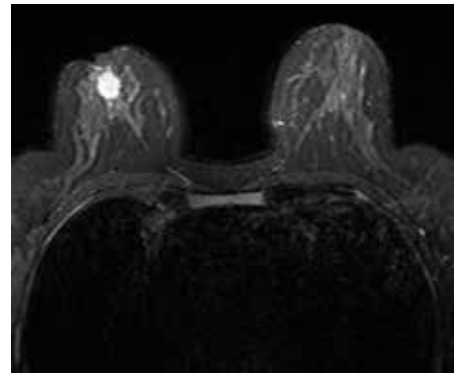
PET-CT axial fusion view



Vibrant MIP arterial Phase view



PET Axial view



FRFSE-XL post contrast view

## Enabling technologies

Gemstone™ Spectral Imaging (GSI) is a novel dual energy application that uses rapid kV switching to acquire the dual energy samples almost simultaneously to generate material density data that can be used for the separation of materials and derivation of monochromatic spectral images using a projection based reconstruction algorithm.

## Conclusion

Thanks to its significant iodine enhancement at low energy level on monochromatic images; that provided similar tumor conspicuity with dynamic-enhanced breast MRI and PET-CT.

The number of tumor foci and axillary metastatic lymphadenopathies were easily identified with 40-60 keV monochromatic image reconstructions and iodine density images. Also quantitative measurement provided significant information when we compare with routine CT acquisition.

GSI technology goes beyond traditional HU measurements while still being dose neutral with a standard CT study. Clinical findings have been correlated with CT findings. The low dose GSI protocol along with GSI ASiR™ reduced the radiation dose in this very radiosensitive area of the body.

## About GE Healthcare

GE Healthcare provides transformational medical technologies and services to meet the demand for increased access, enhanced quality and more affordable healthcare around the world. GE (NYSE: GE) works on things that matter - great people and technologies taking on tough challenges. From medical imaging, software & IT, patient monitoring and diagnostics to drug discovery, biopharmaceutical manufacturing technologies and performance improvement solutions, GE Healthcare helps medical professionals deliver great healthcare to their patients.

**GE Healthcare**  
3000 N. Grandview Blvd.  
Waukesha, WI 53188  
USA  
[www.gehealthcare.com](http://www.gehealthcare.com)



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