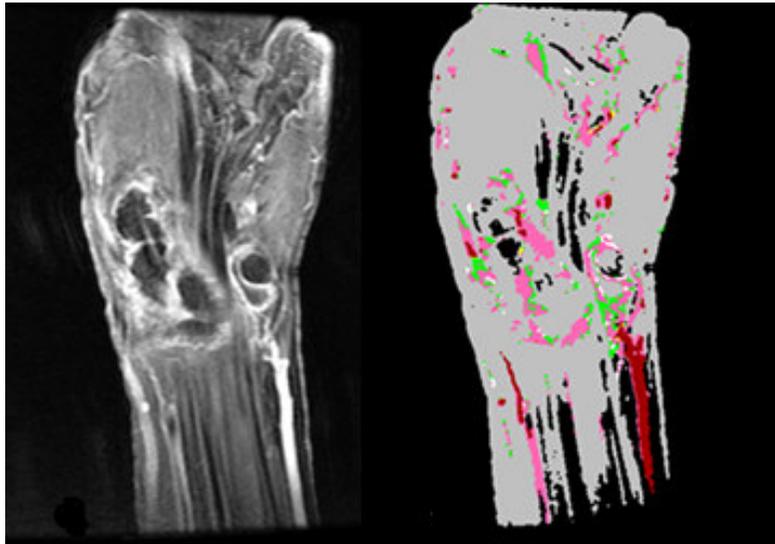


# QUANTIFICATION OF SYNOVITIS IN HAND USING DYNAMIC CONTRAST ENHANCED MRI

Dynamic contrast enhanced MRI has a potential to quantify synovitis in patients with rheumatoid arthritis.

We challenge to visualize and quantify synovitis accurately and to reduce acquisition time via sophisticated way of analysis.



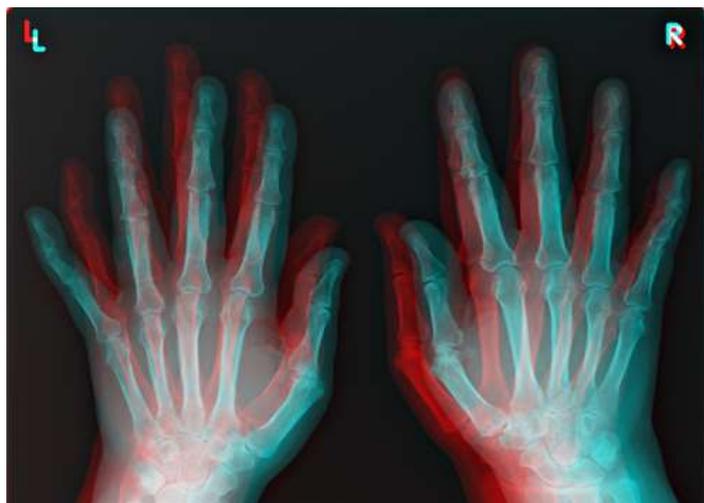
MR image

Quantification map  
(■: synovitis)



Yuto KOBAYASHI

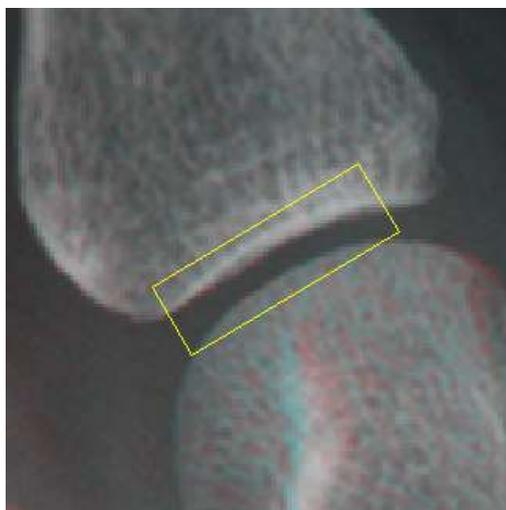
## A reliability study using computer-based analysis of finger joint space narrowing in rheumatoid arthritis patients



Radiograph is the most common modality to assess the degree of the RA progression in daily practice.

We developed a computerized method which can detect objectively joint space narrowing progression.

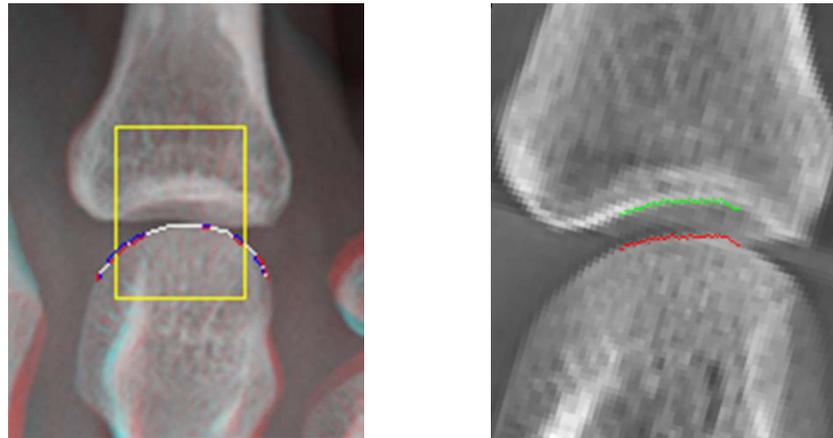
This method has high reproducibility and does not need special training to assess joint space narrowing with inter-observer ICC of almost 1.



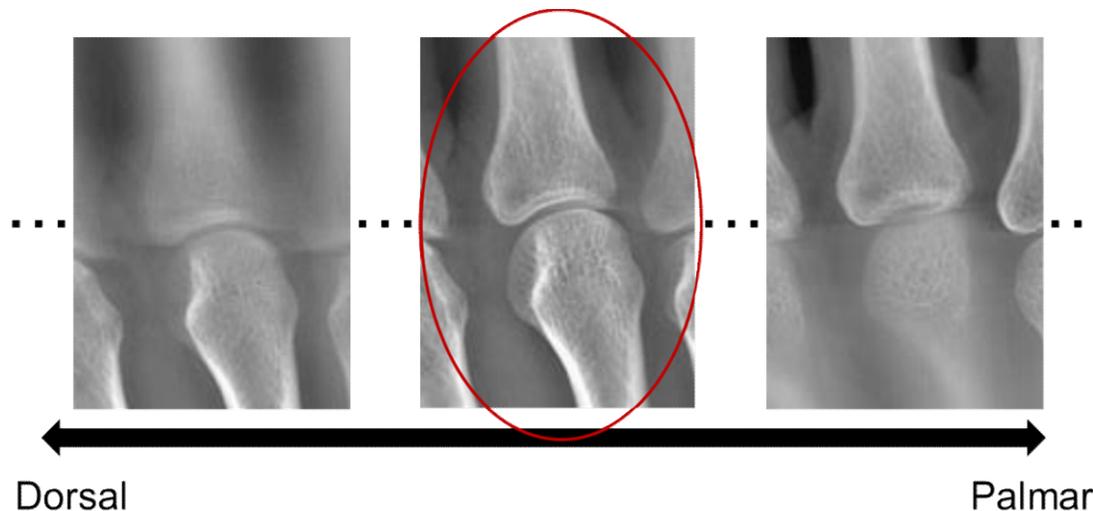
Katsuya HATANO

# Computer-based Method for Assessment of Joint Space Narrowing in Patients with Rheumatoid Arthritis

1. Development of software for joint space measurement in radiography and tomosynthesis

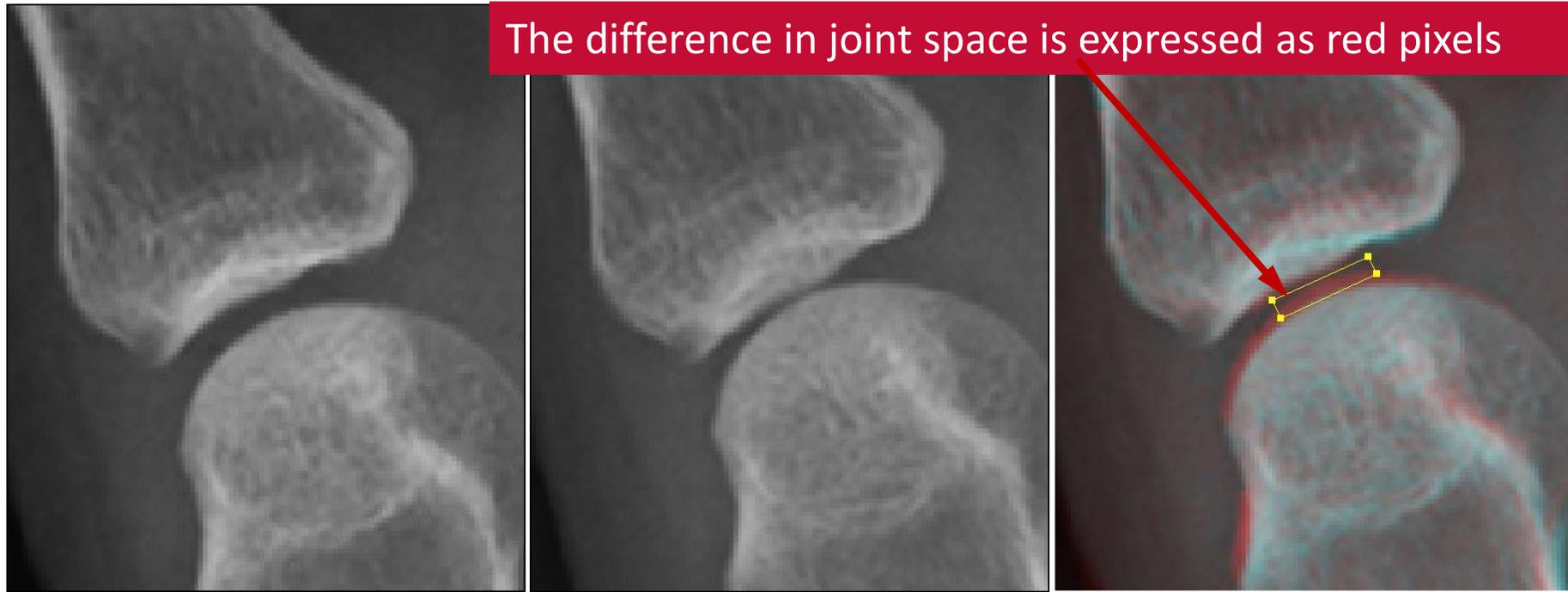


2. Automatic relevant sectional image selection from tomosynthesis



Shota ICHIKAWA, RT

# ASSESSMENT OF RADIOGRAPHIC JOINT SPACE NARROWING IN RHEUMATOID ARTHRITIS USING AN ORIGINAL SOFTWARE



Baseline image

Follow-up image

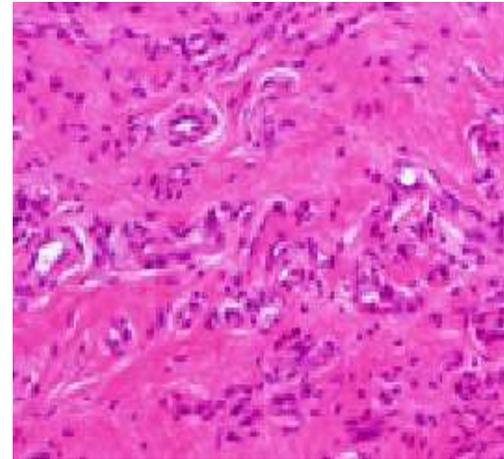
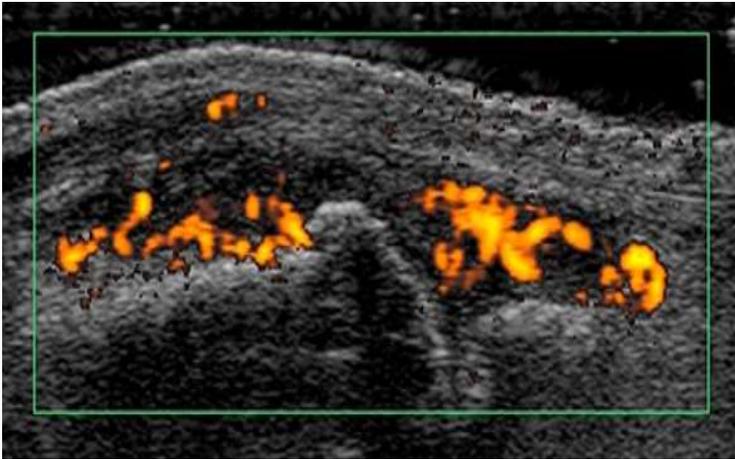
Fused image

The original software can objectively and quantitatively detect finger joint space narrowing progression on radiographs.



Taichi OKINO, RT

# RELATIONSHIP BETWEEN POWER DOPPLER GRADE AND THE PATHOLOGICAL BLOOD VESSEL FEATURES



In the assessment of rheumatoid arthritis (RA), power Doppler ultrasonography (PDUS) can visualize synovitis with high sensitivity, capturing the abnormal blood flow generated in the synovial joint.

We elucidated what determines the magnitude of PDUS signal intensity in patients with RA.

We found larger capillary vessel (presumably faster capillary flow) may reflect positive PDUS signal in long standing RA.

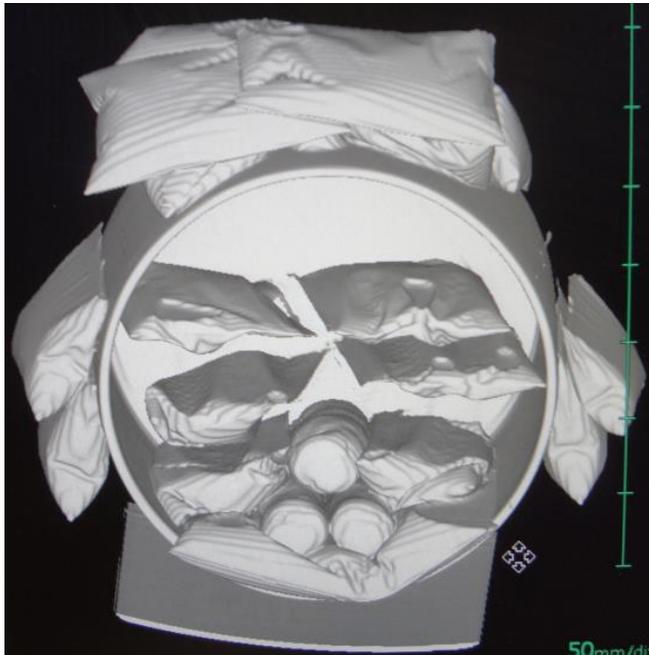
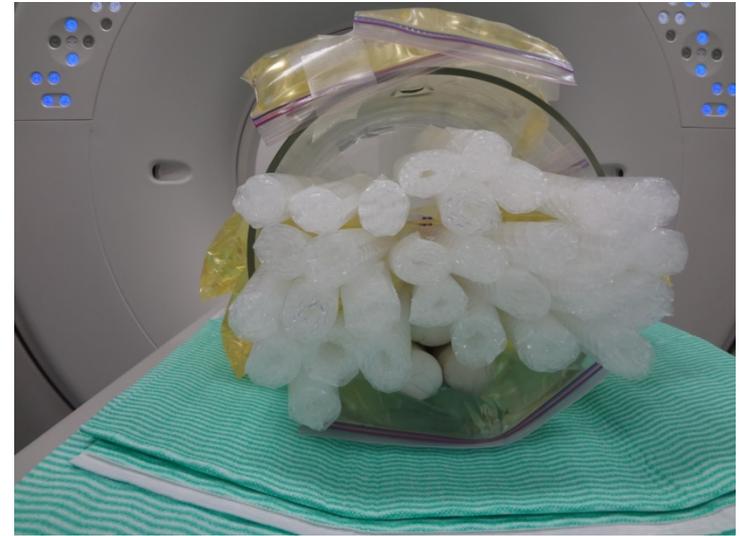


Katsumi SAITO

# VARIOUS ORGAN VOLUMETRY BY CT AND MRI

Our research focus is on tissue/organ volumetry using CT and MRI. Our volumetric analysis permits accurate evaluation of site-specific tissue/organ volume.

We are also trying to reduce patient exposure dose, while maintaining high image quality for tissue/organ volumetry.



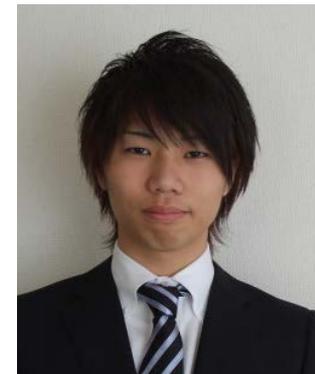
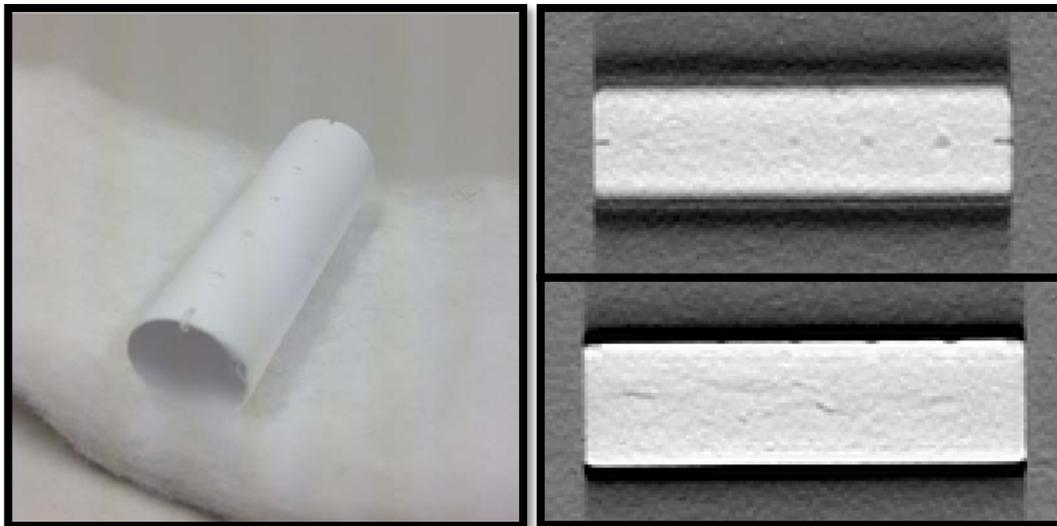
Takahiro ONUMA

# RHEUMATOID ARTHRITIS IMAGING USING DIGITAL TOMOSYNTHESIS – A PHANTOM STUDY

Digital tomosynthesis can acquire tomograms of the selected region of the body with a single X-ray exposure.

It is expected that digital tomosynthesis depicts more lesions of early rheumatoid arthritis than radiograph.

Comparison study with radiograph and computed tomography revealed that digital tomosynthesis may be a useful modality with satisfactory lesion detection ability and reduced X-ray exposure.

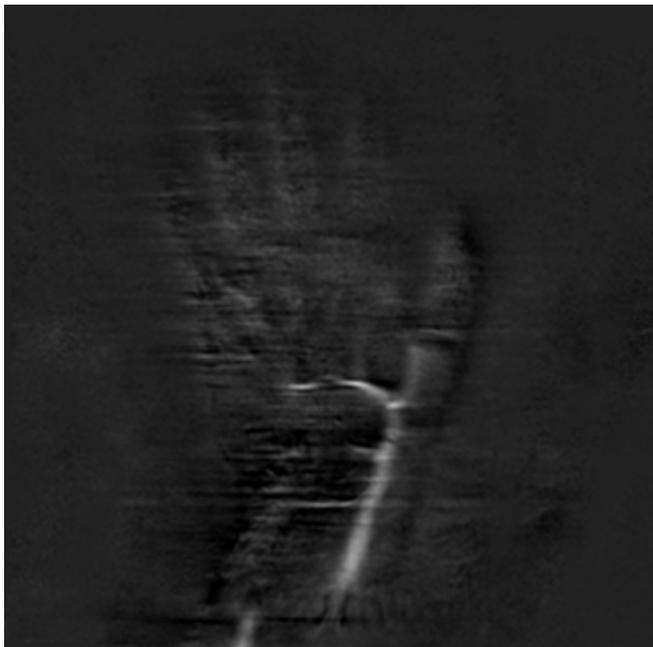


Youhei ONO

# ADJUSTING ASL METHOD IN WRIST JOINT

We are trying to depict vascular flow in the synovitis of rheumatoid wrist using arterial spin labeling (ASL) method which is a noninvasive magnetic resonance (MR) technique for perfusion measurement.

At the present stage, we are adjusting the imaging parameter of ASL method in the wrist joint.



Taro SAKASHITA

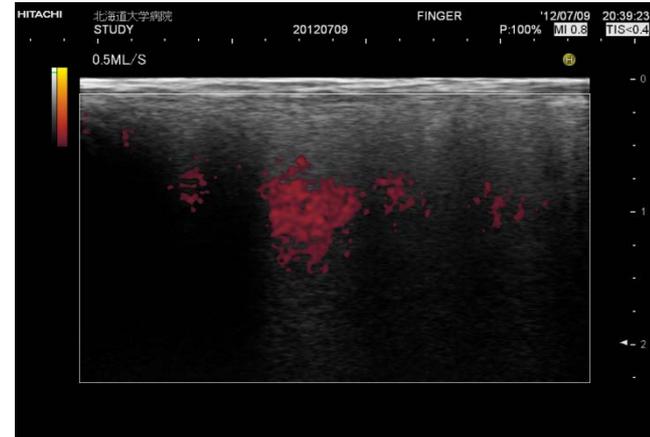
# POWER DOPPLER SIGNAL CALIBRATION BETWEEN ULTRASOUND MACHINES USING A CAPILLARY FLOW PHANTOM

Disease activity and treatment response may be estimated by power Doppler ultrasound in rheumatoid patients.

But, it is well known that there are significant machine-to-machine disagreements for signal quantification.



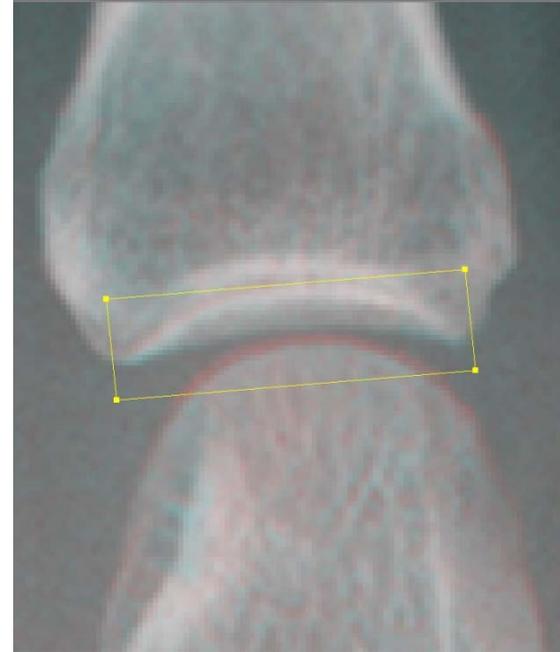
Signal calibration of various models of ultrasound machines is possible using a capillary flow phantom.



Ryosuke SAKANO, RT

# INTERVAL CHANGE IN JOINT SPACE NARROWING ON RADIOGRAPH

## DEVELOPMENT AND VALIDATION OF THE ORIGINAL SOFTWARE



Radiograph is currently the gold standard for detection of joint space narrowing in rheumatoid arthritis in clinical practice.

The original software can recognize the difference of joint space on radiographs and may quantify its degree objectively.



Ryosuke SASAKI, RT