

ECR TODAY 2016

EUROPEAN CONGRESS OF RADIOLOGY

DAILY NEWS FROM EUROPE'S LEADING IMAGING MEETING | SATURDAY, MARCH 5, 2016

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Renowned European radiologists receive Gold Medals at ECR 2016

BY INGA STEVENS

Japan shows the way with new clinical breakthroughs in neuroimaging

Japan has a particularly rich heritage in the field of neuroradiology. The importance of neuroimaging, especially involving the use of MRI, will become greater as the clinical requirements increase, according to Prof. Shigeki Aoki, chairman of the Radiology Department of Juntendo University in Tokyo.

"While MRI and MR sequencing will continue to develop, we are anticipating a lot of development in terms of quantitative analyses and post-processing," he told *ECR Today*.

Also, Japanese manufacturers are breaking new ground when it comes to the development of CT. "I use multislice CT (320-slice) for paediatric cases and cerebrovascular diseases. CT angiography with perfusion data and metallic artefact delineation are especially useful for evaluation after neurointervention such as flow diverter (pipeline) implantation," Aoki said.

The founding fathers of Japanese neuroradiology – Prof. Makoto Saito and Prof. Kentaro Shimidzu, who both trained at Tokyo University Hospital in the 1910s and 1920s

– are still held in high regard in this island country. The pair were credited for the development of pioneering neuroimaging techniques and inspired many of Japan's current radiologists to specialise in neuroimaging.

Japan continues in this tradition of contributing in neuroradiology with a host of practices and technologies, including the so-called Brain Dock brain scanning health check and the early clinical application of diffusion tensor imaging (DTI). These are just two of the areas of neuroradiology where Japanese researchers have had a significant influence on a global scale.

At today's 'ESR meets Japan' session, Aoki will discuss some of the country's most recent neuroimaging

techniques, including the fundamentals of advanced diffusion analysis beyond DTI. Also, delegates will learn about improving treatment decisions in advanced liver imaging, the use of multimodality fusion imaging of ultrasound, CT and MRI for treatment of liver tumours, as well as how to use CT, MRI, and PET in the diagnosis of thymic tumours.

The Brain Dock system, part of the larger 'Ningen Dock' system, has evolved as a service provided by a range of medical facilities. The voluntary health-check system of using MRI and MR angiography for detecting non-ruptured cerebral aneurysms and asymptomatic cerebral infarction, microbleeds and ischaemic changes, is thought to be unique to Japan. The Japan Society

of Ningen Dock reported that brain lesions are found in about 2% of patients, and as brain disease often develops suddenly, before patients have subjective symptoms, detecting signs at an early stage makes proper prevention possible.

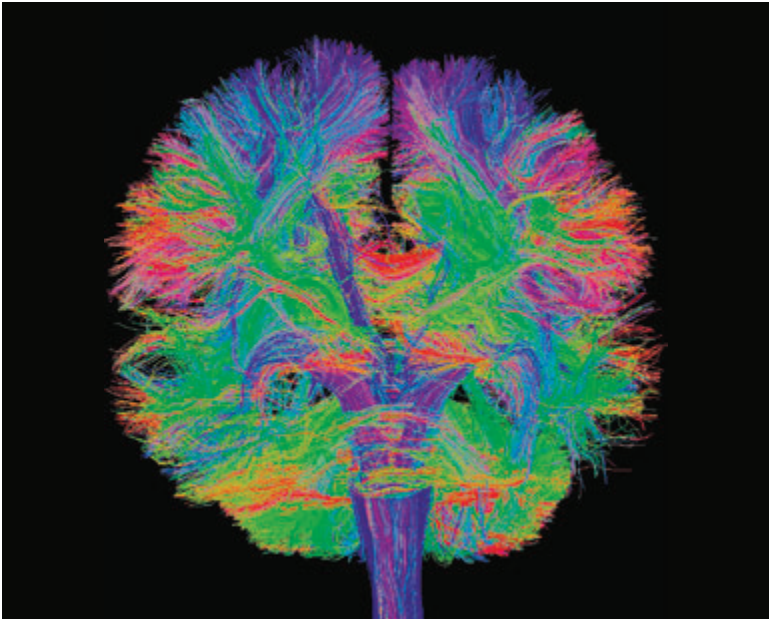
The early clinical application of diffusion tensor imaging (DTI) has been developed in Japan and neuro-radiologists across the country are working hard on the evolution of the technique.

Aoki and colleagues reported on the use of DTI and transcranial magnetic stimulation (TMS) for the evaluation of amyotrophic lateral sclerosis (ALS) as long ago as 2005 in the journal *Neurology*. The purpose of their study was to assess the clinical feasibility of region-of-interest



Prof. Shigeki Aoki from Tokyo will speak on neuroimaging in today's ESR meets Session.

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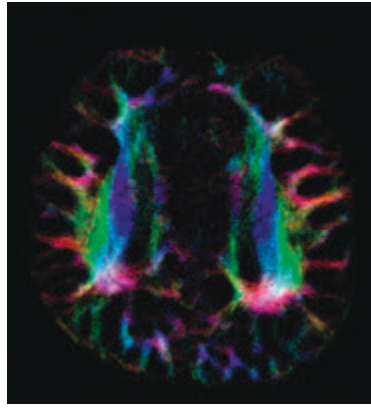
Diffusion tractography of hypogenesis of corpus callosum in 35-year-old woman who presented with mild headache. Both images acquired on 3T MRI (Siemens Skyra) with multiband echo planar imaging 3 (voxel size 2*2*2 mm, TR/TE 5000/97[ms], multi-band factor 3, acquisition time 6 min, MPG 30 [each b value], b = 0, 1000, 2000 s/mm²). (Provided by Prof. Shigeki Aoki)

(ROI) analysis using diffusion tensor tractography (DTT) in patients with ALS. They found DTT can segment certain white matter tracts and evaluate them quantitatively, and it could depict the subtle changes between subtypes of ALS, as well as the changes between the patients and volunteers.

In Japan, radiology is going through some exciting changes. The Japanese Radiology Board programme is developing a new 'standardised' programme for training and maintaining the Radiology

Specialty Board. Expected to begin in early 2017, the new system should ensure that any speciality starts off on a secure and well-respected footing.

A recent review of the programme by the Organisation for Economic Co-operation and Development (OECD) highlighted the need for a clear licensing or credentialing criteria to make the distinction between the current cadre of physicians working as general practitioners and the future primary care specialists that Japan wishes to create. The distinc-



tion, according to the OECD, is to be based upon a clear vision of how these specialists will differ from the current workforce.

It is hoped that the specialty board programme may resolve the shortage of radiologists in the nation. Currently, Japan has the highest number of CT and MRI scanners per unit population in the world, but the relative number of radiologists is the lowest among the OECD countries. The Japanese Radiological Society (JRS) uses every opportunity to highlight shortage of specialist radiologists.

A 2015 study published in the *Japanese Journal of Radiology* estimated that the number of CT and MRI interpretation reports and radiation treatment plans that one full-time radiologist could complete within an eight-hour hospital day were 19.9 and 1.22, respectively. To complete all CT and MRI reports, at least 2.09 times more full-time diagnostic radiologists are needed in Japan. The study suggested that centralised radiation therapy facilities might be more

efficient for meeting the increasing demand.

Aoki believes teleradiology will also have a huge impact on the efficacy of diagnosis and treatment in Japan and may compensate for the shortage and uneven distribution of radiologists. While the practice is becoming widely implemented by healthcare facilities, the gap between radiologists in urban and rural areas is increasing.

"Teleradiology, which is one way to ameliorate this gap, should be

encouraged," he said. "JRS is negotiating with the Ministry of Health about this, especially for sparsely populated areas and for emergency cases."

Due to the relatively high number of MRI scanners per unit population, Japan is in a good position when it comes to using imaging technology to conduct research. Aoki is optimistic that Japanese neuroradiologists will continue to offer an important contribution to this field in the future.

ESR meets Session

Saturday, March 5, 10:30–12:00, Room B

ESR meets Japan

EM 2 State-of-the-art radiology

Presiding: K. Riklund; Umeå/SE
H. Honda; Fukuoka/JP

» Welcome by the ESR President

L. Donoso Bach; Barcelona/ES

» Introduction: Radiology today in Japan

H. Honda; Fukuoka/JP

» State-of-the-art of neuroimaging

S. Aoki; Tokyo/JP

» Interlude: Radiologist's intermission: refreshing photo-stream on our beautiful country (I)

Y. Miki; Osaka/JP

» Advanced liver imaging: improving treatment decisions

T. Murakami; Osaka/JP

» Interlude: Radiologist's intermission: refreshing photo-stream on our beautiful country (II)

T. Taoka; Nagoya/JP

» Diagnostic imaging of thymic tumours

N. Tomiyama; Osaka/JP

» Panel discussion: Always be a pioneer: state-of-the-art technologies from Japan

BY MÉLISANDE ROUGER

Distinguished Swedish neuroradiologist to deliver honorary lecture

Professor Staffan Holmin from Stockholm, Sweden, is a leading expert in interventional neuroimaging. In recognition of his significant expertise in the field of neurointervention and his great achievements in research, Professor Holmin has been invited to give the Sven-Ivar Seldinger Honorary Lecture 'Imaging and micronavigation – time to redraw the map?' at ECR 2016.



Prof. Staffan Holmin from Stockholm, Sweden, will deliver today's Sven-Ivar Seldinger Honorary Lecture on neuroimaging.

Staffan Holmin is the Söderberg professor of clinical neuroimaging at Karolinska Institutet. He is also a consultant in endovascular neurointervention and vice chairman of the neuroradiology department at Karolinska University Hospital in Stockholm, Sweden.

Prof. Holmin leads the research group in neuroradiology at Karolinska Institutet, working on clinical and experimental projects in stroke management and endovascular technique development, and is responsible for the imaging research facilities in the planning of the new Karolinska Hospital.

After graduating with a medical degree from Karolinska Institutet in 1995, Prof. Holmin obtained his doctoral degree in 1997 and his physician certification from the same institution in 1999. In 2006 he did a post-doc and fellowship training at Bicêtre Hospital in Paris, France,

under the supervision of Professor Pierre Lasjaunias.

In 2005 he passed the Swedish and European specialist neurosurgery examinations and two years later the Swedish specialist neuroradiology examination.

"During my specialist training in neurosurgery, I became increasingly interested in minimally invasive image-guided therapy," he said. "Thus when I received an offer to begin training in neuroradiology, I decided to accept it. I was also offered a one-year fellowship in neurointervention with Prof. Lasjaunias in Paris and since then my field of subspecialisation has been endovascular neurointervention. I have always been interested in the enormous potential of endovascular techniques."

Prof. Holmin is the main inventor of an endovascular device for transvascular passage (Extroducer), a project

he developed together with Karolinska Institutet Innovations AB between 2008 and 2014. The project resulted in granted patents in USA, Japan and Europe.

He has been responsible for human and animal imaging facilities in the research building of the New Karolinska Hospital since March 2013. He is the Karolinska Institutet's representative for neuroradiology in the preparation for the New Karolinska Hospital. He is the principal investigator and co-principal investigator for a number of different national and international research projects,

and is currently developing additional new applications for endovascular techniques.

"It is truly a great honour and privilege for me to give the Sven-Ivar Seldinger Honorary Lecture at ECR 2016 in Vienna. It is definitely one of the highlights of my career so far. Being an admirer of Seldinger's work, I am grateful for the opportunity to present the work we have done in our research group in this context."

Don't miss today's Honorary Lecture

Saturday, March 5, 12:15–12:45, Room A

Sven-Ivar Seldinger Honorary Lecture

» Imaging and micronavigation: time to redraw the map?

Staffan Holmin; Stockholm/SE