

How MIYABI Angio-CT, syngo DynaCT and syngo Embolization Guidance Play Together at Hokkaido University Hospital

Hokkaido University Hospital is located on vast, lush grounds at the heart of Sapporo City, Japan. As well as contributing to advanced local medical care supported by state-of-the-art equipment and developing new treatment methods, this hospital has also been designated as a core clinical research and pediatric oncology center. Doctors working at the forefront of the clinical use of the MIYABI Angio-CT solution report here on their experience.

Please explain how the MIYABI Angio-CT is used at your institution.

Yusuke Sakuhara, MD: We already had a combined Angio-CT solution. Since we have so many cases of hepatocellular carcinoma (HCC) and several complex disease scenarios that need to be treated by intervention with CT fluoroscopy, a decision was made to boost our efficiency by acquiring another computed tomography scanner for dedicated use in the angiography room.

Daisuke Abo, MD: There are always some cases that cannot be addressed with an angiography system alone, so the MIYABI solution which combines an angiography system with the high performance of a multidetector computed tomography (MDCT) was essential for our needs.

Hiroshi Arai, Chief Technician: During negotiations with our administrative department, we discussed whether we needed a CT or if syngo DynaCT would be sufficient. In the end, after considering clinical requirements and the performance scope of the multislice CT, a decision

was taken to acquire a solution with both angiography and CT imaging functions.

Shunichi Ueda, Deputy Chief Technician: The vascular imaging room is narrow (55 m²) and so a general straight configuration was not possible. However, Siemens proposed a solution similar to that for the previous MIYABI: The sliding gantry rails could be installed via a 90-degree rotation. After that, the installation became relatively smooth.

Which types of examination is MIYABI Angio-CT particularly useful for and how often are examinations performed?

Ueda: We examine 180 cases per year with the combined solution. Procedures where only confirmation of the puncture position is required are often performed under CT guidance only.

Sakuhara: MIYABI is particularly useful in blood flow diagnosis of the hepatocellular carcinoma (HCC). Recently, the diagnostic imaging capability of MRI for hepatocellular carcinoma and liver tumors has improved and the importance of CT

(CTAP, CTHA) is no longer as great as it was. However, sometimes evaluation of arterial blood flow using Dynamic CT and MRI is not enough, so CT angiography is still useful. When performing a CT of the hepatic artery (CTHA) before TACE treatment, the targets for embolization can be set more accurately.

Abo: I think the strength of the MIYABI solution is the combination of CT and angiography for qualitative evaluations. Although, DynaCT imaging can substitute MIYABI Angio-CT in certain cases, the superiority of the combined approach is undisputed. Now, thanks to the installation of the 64-slice SOMATOM® Definition AS with the MIYABI suite, many more patients can also be treated.

In addition to treating HCC, which other clinical applications are possible?

Abo: MIYABI Angio-CT is helpful in placing therapeutic markers. We generally use echo for punctures if there is a lack of confidence in the three-dimensional relationship of the position. On a CT image, the relationship between the lesion and the marker can be seen immediately. This means that unnecessary punctures can be avoided and any potential complications can also be identified from the image.

Sakuhara: In complex drainages the operation is performed under fluoroscopic guidance of the angiography equipment. And to confirm the position we use the CT – this increases accuracy. When the drainage catheter



“The greatest advantage of the combined solution is its accurate diagnosis of arterial blood flow.”

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Daisuke Abo, Yusuke Sakuhara, Hiroshi Arai, Shunichi Ueda and team in front of their MIYABI Angio-CT solution (Artis zee ceiling + SOMATOM Definition AS).

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is inserted under CT guidance and we switch to the angiography system the patient can stay on the same table as the CT is placed in the angiography suite. Thus movement of the puncture needle and wires can be avoided.

How does syngo Embolization Guidance support your work?

Abo: *syngo* Embolization Guidance shows the 3D relationship between tumors and the arteries connected to the tumors and also shows correspondence with the X-ray fluoroscopic image in an easily accessible way. The very fine feeding artery can also be tracked with a high degree of accuracy.

Before we had this new software, there were cases where the artery feeding the tumor could not be identified and so treatment was abandoned. These cases have also decreased.

Sakuhara: The movement of the C-arm can be tracked. If we do a vessel overlay this allows us to easily identify which blood vessel was entered before and after it. Overall, the amount of contrast agent used and the duration of the fluoroscopy have decreased markedly.

In the future, how do you think syngo Embolization Guidance should be used?

Sakuhara: In the treatment of uterine artery embolization, identification of the bifurcation section of the uterine artery is difficult, which means that fluoroscopy tends to take longer. I think that if the DynaCT exposure is

reduced to a minimum level, it could be used when imaging the pelvic area. I also think it would be valuable to test TAE of the kidney and the prostate.

Abo: I would also like to use it in the bladder artery.

How is the operability of the combined solution?

Ueda: The CT and the angiography have the same *syngo* user interface, so it can be mastered swiftly – even by newly deployed technicians. The rails of the sliding CT are also flat, so they can be kept clean easily.

How do you see the future for MIYABI Angio-CT solutions?

Sakuhara: I think that improvements in the grey-scale resolution ability of *syngo* DynaCT, a decrease in artifacts, and an expansion of the field of view will decrease the differences between the two modalities. The greatest advantage of the combined solution is its accurate diagnosis of arterial blood flow. There are many instances where *syngo* DynaCT is not sufficient, for example, for diagnosis of the blood flow to organs and tumors.

Abo: Transarterial and transvascular diagnosis of blood flow require the high temporal resolution of MDCT to understand the pathology of the condition. In my opinion, MIYABI Angio-CT offers the best performance for treating our patients at the present time of development.

MIYABI Angio-CT is a customized solution and not commercially available in all countries. Due to regulatory reasons the future availability cannot be guaranteed. Please contact your local Siemens organization for further details.



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Chief Technician



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