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History of Gamma Knife Radiosurgery and Stereotactic Body Radiation Therapy (SBRT) in Japan

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Long before introducing Gamma Knife in Japan, in 1975, Professor Minoru Jimbo (Tokyo Women's Medical University Second Affiliated Hospital) obtained a government scholarship to study in Sweden. At that time, he visited Karolinska Hospital and he was very interested in Gamma Knife. Between 1978 and 1990, he referred 40 Arteriovenous Malformation (AVM) patients from Japan to Karolinska Hospital. Gamma Knife then became well-known in Japan. The development of this technique in Japan was achieved by the efforts of Professor Kintomo Takakura (Former professor of Tokyo University and Tokyo Women's Medical University) and Professor Tomio Sasaki (former Professor of Kyushu University and Gunma University) at Tokyo University. Several negotiations with the government were necessary to finally inaugurate the first Gamma Knife Unit (Model B) in Tokyo University in April 1990. The second Gamma Knife Unit was installed in Komaki Municipal Hospital at Nagoya in May 1991 by Dr. Tetsuya Kobayashi. In November 2002, a second generation of Gamma Knife Unit (Model C) was built at Jiro Suzuki Memorial Gamma House, Furukawa Seiryō Hospital. Third (Gamma Knife Perfexion) and fourth (Gamma Knife Icon) unit generations were introduced respectively in December 2008 and October 2016, in the same Hospital.

In Japan, Intracranial Lesions and Trigeminal Neuralgia are covered by the National Health Insurance. Nowadays, 54 machines are operational and over 230,000 patients have been treated, including 165,000 malignant tumor patients, 44,000 benign tumor patients, 16,000 patients with vascular lesions and 6,000 with functional

disorders.

In the late 1990s, clinical experiences using Stereotactic Body Radiation Therapy (SBRT) started in Japan by several groups such as Dr. Uematsu's team at the National Defense Medical School. Inspired with striking effects using SRT, they organized a group for extracranial diseases with national health insurance SRT coverage, in 1999. For the first time in the world, SBRT was approved by the government as a treatment modality for non-small cell lung cancer (NSCLC) and liver tumors in 2004.

Thereafter, SBRT has become more popular in Japan. Based on the reports from the external beam radiotherapy group of the Japanese Society for Radiation Oncology (JASTRO) in 2017, this technique is currently being applied by 196 Japanese hospitals. Until December 2016, the cumulative number of patients treated by SRT has been: 9344 for primary NSCLC, 231 for SCLC, 4664 for metastatic lung cancer, 4690 for lung tumors without histological confirmation, 3144 for primary liver tumor, 1010 for metastatic liver tumor, and 538 for prostatic cancer.

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