# REVIEW ARTICLE

# JASTRO 20年の歩み―誕生の経緯と明日への期待

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## THE 20 YEAR HISTORY OF JASTRO—THE ROAD TO ITS BIRTH AND HOPE FOR TOMORROW

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**Abstract:** Radiotherapy in Japan has long remained sluggish while diagnostic radiology has thrived by an innovation of diagnostic technologies such as CT and MRI in the 1970's. This stream has attracted many radiologists to radiation diagnostics. There were few who devoted themselves solely to the practice of radiotherapy in those days. In order to promote radiotherapy and establish radiation oncology as a distinct medical specialty, the Japanese Society for Therapeutic Radiology and Oncology (JASTRO) was founded in February 11, 1988 as a result of enormous and tireless efforts by many radiation oncologists. At the start of the society, the membership was only 943. Initially it has grown slowly in size but increased markedly since the beginning of the 21st century and amounted to 3,195 in 2007. The most serious problem at present is a disproportionate number of radiation oncologists to a rapid increase in the number of radiotherapy patients. To resolve the shortage of radiation oncologists, the departmentalization of radiation oncology is basically important because professors have principal rights and responsibilities for education, training and recruiting of medical students. In recent years it has been recognized that highly advanced radiotherapy including IMRT, IGRT or charged particle radiotherapy can provide equivalent or rather superior survivals to surgery and a good QOL for cancer patients. Radiotherapy is expected to play a leading role in cancer therapy in the not distant future.

Key words: History of JASTRO, Thorny past, Problems at present, Hope for tomorrow

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# MLCファントムを用いた三次元放射線治療計画システムにおける non-dosimetric QA

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## NON-DOSIMETRIC QUALITY ASSURANCE FOR THE THREE-DIMENSIONAL RADIATION TREATMENT PLANNING SYSTEMS USING A MULTI-LEAF COLLIMATOR PHANTOM

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***Abstract:*** Purpose: Evaluation of errors and limitations in simulation software for three-dimensional radiation treatment systems (3D-RTPS) is an important issue. Non-dosimetric quality assurance (QA) of the simulation software of 3D-RTPS was evaluated by graphical displays of JAW and MLC settings in a 3D-RTPS. The influence of observations made using the phantom depends on human errors and several parameters of the CT scan set, such as slice thickness and spacing, pixel size, partial volume effects and the reconstructed image orientation. We explored the methods that were minimally influenced by these errors and parameters.

Methods and Materials: The QA phantom (MLC phantom) has been designed for checking a JAW and MLC settings in a 3D-RTPS is used for non-dosimetric QA. We analyzed the CT value of the boundary the structures of the MLC phantom.

Results: The relative CT value for thickness 1 mm slice in border of each structure body of MLC phantom respectively shows a decrease of about 2%, 4%, 10% by 2 mm, 3 mm and 5 mm. In case of thickness 5 mm slice, the mean deference of border of virtual radiation beams and phantom was 0.8 mm, and standard deviation of them was 0.6 mm. And the mean difference of border of a DRR image and phantom was 0.08 mm and the standard deviation of them 0.6 mm. In case of thickness 2 mm slice, the mean deference of border of virtual radiation beams and phantom was –0.18 mm, and standard deviation of them was 0.32 mm. And the mean difference of border of a DRR image and phantom was 0.87 mm and the standard deviation of them 0.54 mm.

Conclusion: The result of the study is useful for improvement in a precision of non-dosimetric QA. Our method of non-dosimetric QA can minimize human error and influence of several parameters of the CT scan set. The MLC phantom is a useful tool in the QA of radiation therapy with application to 3D-RTPS, CT simulators, and virtual simulation packages with MLC display capabilities.

Key words: Multi-leaf collimator, Quality assurance, Radiation treatment planning system

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# 定位脳照射の時代における肺癌脳転移放射線治療
## —長期生存者の臨床的特徴について—

清水　わか子

## THE CONVENTIONAL IRRADIATION FOR BRAIN METASTASES FROM LUNG CANCER IN THE ERA OF STEREOTACTIC RADIATION: THE CLINICAL CHARACTERISTICS OF LUNG SURVIVORS

Wakako Shimizu

*Abstract:* Purpose: Lung cancer that metastasized to the brain has a poor prognosis, but there are some patients showing favorable prognosis. An analysis of tumor/patient characteristics and treatment is considered necessary to select the patients who might benefit from more radical radiotherapy to prevent brain metastases. Patients and Methods: I retrospective study was performed on radiotherapy and the subsequent consequences of fifty-six cases with lung cancer that had metastasized to the brain, without SRS/SRT, from 2001 to 2006. The survival of these patients was determined from the beginning of radiotherapy for brain metastases to the time of death. Results: The median survival time was 91 days, but the survival time exceeded one year for cases with good PS and cases with controlled extracranial lesions. There were eight patients surviving over one year, five of them have been histologically proven as adenocarcinoma. Conclusion: Good performance status, control of extracranial disease and adenocarcinoma seemed to be favorable prognostic factors after cranial irradiation for brain metastases from lung cancer. Further, there are some reports stating that molecularly targeted drugs are effective to brain metastasis. More studies are needed in the area of combination therapies, prognostic factors and clinical courses.

Key words: Lung cancer, Brain metastases, Prognostic factors

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