

Radiation Oncology Division

Introduction

Radiation therapy (RT) plays an essential role in the care of patients with cancer. It is used as curative treatment for many patients with malignant disease, as integrated therapy with chemotherapy and surgery, and as palliative treatment for those in whom curative treatment is not an option. The dose of radiation delivered to the tumor must be as high as possible, while being as low as possible to surrounding normal tissues.

The focus of The Radiation Oncology Division is to develop, evaluate and expand the role of RT in cancer treatment. Establishing optimal irradiation technique, including proton treatment, is also an important goal of the division.

Routine Activities

The Radiation Oncology Division includes five consultant physicians, eight radiation technologists, two medical physicists, one nurse, and one clerk. Conference of treatment planning and verification is held three times per week in the evening, and work conference is held monthly.

Treatment has been mostly based on three-dimensional planning with isodose distributions, performed by RT-dedicated helical scanning CT, to conform the dose to the tumor. Almost 1,000 new patients were treated annually, and more than 20 clinical trials that involve RT as a sole or a combined treatment modality, for various cancers are ongoing.

The conventional (photon-electron) treatment division is equipped with three treatment machines (a Microtron with 2 gantries, a linear accelerator and a high dose rate brachytherapy unit), a CT-simulator, three treatment planning computer workstations, and many other devices. The proton treatment division, the first such hospital-based treatment facility in Japan, is equipped with a cyclotron capable of generating a

235 MeV proton beam. The proton beam is delivered to three treatment rooms (two isocentrically rotational gantries and one fixed horizontal beam line). Two rotational gantry treatment rooms were routinely used.

New Developments in 2003

1. Proton therapy was initiated in Nov. 1998 at our hospital. Proton therapy was approved as a "highly advanced medical technology" from the Japanese Government in July 2001. Until the end of 2003, we have treated 230 patients with the head & neck, lung, liver and prostate cancer.
2. Preliminary outcome of proton therapy for stage I non-small cell lung cancer and hepatocellular carcinoma was analyzed.
3. Targeting accuracy of respiration-gated proton beam radiotherapy for hepatocellular carcinoma was analyzed.
4. Dose-volume histograms in proton therapy for prostate cancer were analyzed, and we initiated clinical trial of proton therapy alone for prostate cancer.
5. Phase I study of CDDP + S-1 for locally advanced head and neck cancer is underway.
6. Several clinical studies of chemoradiotherapy for esophageal cancer were completed. Treatment results of a phase I/II study of nedaplatin + 5FU + RT for T4 disease (JCOG9908), and a phase II study of chemoradiotherapy for stage I disease (JCOG9708) were reported on ASCO 2003.
7. Preliminary outcome of hypofractionated RT combined with sequential gemcitabine for unresectable locally advanced pancreatic cancer was analyzed and reported on ASCO 2003.
8. Radiotherapy Quality assurance (QA) survey and audit were initiated in both Japan Radiation Oncology Group (JROG) and Japan Clinical Oncology Group (JCOG).

● T. Ogino ●

Number of Patients Treated with Radiation Therapy					
	1999	2000	2001	2002	2003
New Patients	729	814	875	936	1010
New Treatments	859	1001	1066	1127	1200
Head & Neck	149	187	186	229	199
Lung, Mediastinum	244	268	323	329	354
Breast	91	164	160	174	202
Gastrointestinal Tract	174	162	188	224	259
Hepatobiliary & Pancreatic Regions	108	105	83	50	63
Gynecological Regions	21	9	2	7	1
Urological Regions	16	35	57	48	60
Bone & Soft Tissue	2	17	12	6	4
Hematological Diseases	37	48	45	51	41
Others	17	6	10	9	17
Primary Site	508	470	574	571	647
Recurrent, Metastatic Site	280	437	398	450	393
Prophylactic Purpose	71	94	94	106	153
Intraoperative RT	50	13	6	1	6
Brachytherapy	10	13	8	4	5
Proton Therapy	18	19	59	64	69

RT: Radiation Therapy