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POSTER

**Impact of Surgery Upon Clinical Outcome and Survival in Patients With Radiation Enteritis**

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**Background:** Radiation enteritis constitutes an important clinical entity. The incidence of intestinal involvement because of radiotherapy varies between 0.5% and 5% of the irradiated patients and is dose dependent. The aim of our study was to evaluate the surgical treatment options, the mortality, the morbidity, and long-term survival in patients with chronic radiation enteritis.

**Patients and Methods:** In a period of 8 years 20 patients were diagnosed with radiation enteritis and admitted to our department. The vast majority of the patients (65%) had been irradiated for gynecologic malignancies. Demographic data, type of surgery performed, mortality, morbidity and survival were analyzed. The median follow up period was 33 months.

**Results:** The mean age of patients was 60±12 years. Fifteen patients were females and five were males. The mean time between the end of radiation therapy and the onset of gastrointestinal symptoms was 40±14 months. Intestinal obstruction was diagnosed in 14 patients, hemorrhage in 2 patients, fistula in 2 and perforation in 2. Surgical methods performed were intestinal resection or bypass surgery. The mortality rate was 15% and the overall morbidity 25%. Morbidity was not statistically related to the nature of the treatment or to the indication for surgery. During follow-up period reoperation was required in 40% of the patients, due to reappearance of symptoms. The overall survival was 90% at 1 year and 55% at 5 years after surgery.

**Conclusion:** Surgery plays an important role in therapeutic aspects of radiation enteritis. For selected patients, resection and primary anastomosis seems to be the appropriate treatment option.

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**Internal Radiotherapy by Strontium Chloride for Painful Bone Metastases**

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**Purpose:** We clarify usefulness of the internal radiotherapy by strontium chloride (<sup>89</sup>Sr) for patients of painful bone metastases.

**Materials and Methods:** Between November 2008 and January 2011, we treated 33 patients with painful bone metastases using <sup>89</sup>Sr. We analyzed the pain relief effects by scoring the change in pain and the increase or decrease in the amount of analgesics. We scored the change in pain as follows: +2 points, +1 point, 0 points, and -1 point corresponded to much relief, relief, no relief, and progression of pain, respectively. We scored the change in the amount of analgesics as follows: +1 point, 0 points, and -1 point corresponded to a decrease, no change, and increase in medicine, respectively. We summed these two scores and defined a good response (GR) as +2 points or more, a partial response (PR) as +1 point, and no response (NR) as 0 points or less. We assessed the relationships between the response and whether or not bisphosphonates were used, whether or not tumours spread from the bones, irradiation history, and the value of alkali phosphatase (ALP) before treatment with <sup>89</sup>Sr.

**Results:** The mean age of the 33 patients was 61 years old. The primary sites were the lung in 9 cases, the breast in 8 cases, the prostate in 6 cases, and other organs in 10 cases. The mean number of points for pain relief was 1.00. GR:PR:NR = 13:10:10. The mean score of patients who were using bisphosphonates (n = 19) was 1.05, compared with 0.21 for those not using bisphosphonates (n = 14). The mean score of the patients whose tumours were not expanding from the bones (n = 23) was 1.26, compared with 0.57 for those whose tumours were not spreading (n = 19). The mean score of patients who had a history of irradiation (n = 19) was 1.05, and that of those who did not have an irradiation history (n = 14) was 0.93. The mean score of the patients whose ALP value before treatment with <sup>89</sup>Sr was less than 400 (n = 13) was 1.31, and that of those whose ALP value was 400 or more (n = 14) was 0.80.

**Conclusions:** The effect of <sup>89</sup>Sr was good in patients who used bisphosphonates, patients who did not have tumours spreading from the bones, and those who had a low ALP value before <sup>89</sup>Sr treatment.

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**Preliminary Results of Stereotactic Body Radiation Therapy for Hepatocellular Carcinoma and Liver Metastases**

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**Background:** To retrospectively evaluate the feasibility and safety of stereotactic body radiation therapy (SBRT) for the treatment of hepatocellular carcinoma (HCC) and liver metastases (LM).

**Material and Methods:** From May 2007 to July 2010, 22 patients, 11 with HCC and 11 with LM, were treated with SBRT at Tokyo Medical University. Among the 11 patients with HCC, seven patients with one lesion and one with two lesions underwent SBRT with a curative intent, and three patients with multiple HCC underwent SBRT only to their portal vein tumour thrombosis (PVTT) with a palliative intent. Eleven patients with LM, 10 with one lesion and one with two lesions, were radically treated with SBRT. The longest diameters of the lesions were median 20 mm (range, 7–47 mm). A planning target volume (PTV) was determined as the gross tumour volume plus minimum 7 mm in all directions. A median total dose of 45 Gy (range, 35–45 Gy) in 5 fractions over 5 days was delivered to the isocenter within the 80% isodose line (IDL) covering the PTV.

**Results:** The median observation period was 14 months (range, 2–45 months). For HCC, the tumour response was observed in 11 lesions (91%), with complete response (CR) for 10 lesions (83%) and partial response (PR) for 1 lesion (8%). For LM, the tumour response was observed for 9 lesions (75%), with CR for 8 (67%) and PR for 1 (8%). The 2-year local control rates for HCC and LM were 67% and 83%, respectively. There were 4 locally recurrent tumours of HCC, 3 outside of 80% IDL and 1 within 80% IDL. There were 2 locally recurrent tumours of LM within 80% IDL. Concerning doses given, the 2-year local control rates for tumours was 69% when less than 40 Gy were given and 77% when 40 Gy or more were given. Regarding tumour size, the 2-year local control rates for tumours of less than 20 mm and 20 mm or more in size were 82% and 65%, respectively. The 2-year overall survival rates for patients with HCC and LM were 81% and 69%, respectively. No acute and late treatment-related toxicities of grade 3 or higher were observed.

**Conclusions:** SBRT of 45 Gy in 5 fractions over 5 days seems safe and effective for patients with HCC and metastatic liver tumours. The local recurrences tended to develop within 80% IDL. From this recurrent pattern, dose escalation study for HCC and LM may be necessary.

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**Pelvic Radiotherapy Influences on Plasma Markers of Oxidative Stress and Plasma Endotoxin Level in Gynecologic Cancer Patients: an Observational Study**

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**Background:** The aims of this study were to assess the effect of pelvic radiotherapy on plasma markers of oxidative stress and plasma endotoxin level, and to examine their correlation with radiotherapy-related adverse events.

**Materials and Methods:** Twelve gynecologic cancer patients who were treated by pelvic radiotherapy with or without concurrent chemotherapy were enrolled in this study. Plasma markers of oxidative stress such as glutathione (GSH), oxidized glutathione (GSSG) and total antioxidant capacity, and plasma endotoxin levels were measured weekly during treatment. Subjective symptoms were assessed using EORTC-QLQ-c30 at the baseline and 5<sup>th</sup> week of radiotherapy.

**Results:** Plasma GSH was highly oxidized and thereby GSH/GSSG ratio was dramatically decreased. The mean plasma endotoxin in all patients tended to elevate and persisted during radiotherapy, and the number of patients who showed positive endotoxin (defined as above 0.005 EU/ml) also increased. In QoL, global health status was significantly decreased (baseline; 54.17±4.81 and 5<sup>th</sup> week treatment; 37.5±4.54, p=0.049). Nausea/vomiting, appetite loss, and diarrhea were significant changed symptoms (p<0.05), but it could not be assessed whether changes in such symptoms are related with oxidative stress markers or endotoxin.

**Conclusions:** Pelvic radiotherapy induced the changes of GSH/GSSG ratio and plasma endotoxin. Further investigations containing interventional and longitudinal studies will be required to find out the influence of the changes in oxidative stress markers and endotoxin on the radiotherapy-related adverse events.