

短期予後症例に対する8.5Gy×2 回照射法の検討

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EXAMINATION OF 2 TIMES 8.5 Gy METHOD AS PALLIATIVE THERAPY OF THE CASE THAT CONVALESCENCE IS EXPECTED FOR A SHORT TERM

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Abstract: Objective: To report on the clinical course of cases in which the 8.5 Gy×2 method was used as a palliative irradiation method at our hospital.

Subjects: There were 21 cases in which irradiation with 8.5 Gy×2 was used at our hospital from June 2004 to March 2006. These included 15 male cases and 6 female cases. The ages of the subjects ranged from 49 to 89 years (median value: 65 years of age). KPS ranged from 50 to 90% (median value: 70%). The disorders (symptoms) included 7 cases of mediastinal lymph node metastasis (respiratory discomfort, coughing, and hemoptum), 4 cases of esophageal cancer (dysphagia), 5 cases of lung tumors (hemoptum and SVC syndrome), 1 case each of bone infiltration by soft tissue tumors in the abdomen and in the extremities (pain), 2 cases of abdominal lymph node metastasis (jaundice and pain), and 1 case of HCC biliary infiltration (jaundice).

Method: 10 MVX was used in all cases. The treatment plan was carried out using CT simulation. Irradiation with 8.5 Gy was used twice. The site attributable to the symptoms was defined as GTV, and the region sufficiently containing GTV was defined as PTV.

Results: In 2 cases, the general condition of the patients worsened prior to the second irradiation, and therefore irradiation was discontinued. A total of 19 cases were treated with irradiation. A temporary improvement of the symptoms was observed in 12 cases. Early-stage adverse events (NCI-CTC ver. 2, grade 2 or higher) included 2 cases of grade 2 esophagitis, and 1 case of grade 2 nausea. Late-stage adverse events could not be evaluated.

Conclusion: A temporary improvement of the symptoms was observed in about half of the cases. There were no grade 3 or higher early-stage adverse events. It is believed that this palliative irradiation method is acceptable if long-term irradiation is impossible.

Key words: Radiotherapy, Palliation, Hypofractionation, 8.5 Gy×2

小児腫瘍に対する陽子線治療の実現可能性評価

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FEASIBILITY OF PROTON BEAM THERAPY FOR PEDIATRIC TUMOR

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Abstract: Purpose: The physical properties of proton beam are expected to be beneficial for local treatment of pediatric malignant tumors. Retrospective analysis of treatment planning was performed to evaluate the feasibility of proton beam therapy.

Methods: After exclusion of brain tumor and cases treated by photon combination therapy, fourteen patients were selected from those who had undergone proton beam therapy beam between July 2003 and April 2008 at Shizuoka Cancer Center. The coverage of the clinical target volume (CTV) and planning target volume (PTV) by prescribed dose were evaluated by CTV $V_{95\%}$ and PTV $V_{90\%}$, respectively. Homogeneity of PTV was evaluated by D_{max} . For patients with head and neck tumors, deposited doses of 14 organs, including lens and pituitary gland around the tumor were evaluated and compared with their constraints. Six organs for patients with thoracic tumors and four organs for pelvic tumors were evaluated on deposited dose.

Results: Prescribed dose to the center of tumor ranged between 36 to 67.2 GyE. One patient represented less than 95% in CTV $V_{95\%}$ and three patients represented less than 95% in PTV $V_{90\%}$. D_{max} ranged between 102–106%. Among 146 organs, there were 21 organs were irradiated with the dose more than the constraint. However, 11 of 146 organs were directly invaded by the tumor. Largest portions of patients with exceeding constraints were seen in the lens and the pituitary gland.

Conclusion: Proton beam is a feasible treatment in terms of target coverage and dose homogeneity at the target of the pediatric tumors. There were several organs with exceeding deposited dose to organs over the constraint, including organs with direct invasion or more susceptible to radiation.

Key words: Proton beam therapy, Pediatric tumor, Normal tissue damage, Rhabdomyosarcoma

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肺定位放射線治療における不均質補正法の評価

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EVALUATION OF HETEROGENEITY CORRECTIONS IN STEREOTACTIC
BODY RADIATION THERAPY FOR THE LUNG

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Abstract: Purpose: The purpose was to evaluate impact of heterogeneity corrections on dose distributions for stereotactic body radiation therapy (SBRT) for the lung.

Materials and Methods: This study was conducted with the treatment plans of 28 cases in which we performed SBRT for solitary lung tumors with 48 Gy in 12-Gy fractions at the isocenter. The treatment plans were recalculated under three conditions of heterogeneity correction as follows: pencil beam convolution with Batho power law correction (PBC-BPL), pencil beam convolution with no correction (PBC-NC), and anisotropic analytical algorithm with heterogeneity correction (AAA). Dose-volumetric data were compared among the three conditions.

Results: Heterogeneity corrections had a significant impact on all dose-volumetric parameters. Means of isocenter dose were 48.0 Gy, 44.6 Gy, and 48.4 Gy in PBC-BPL, PBC-NC, and AAA, respectively. PTV D95 were 45.2 Gy, 41.1 Gy, and 42.1 Gy, and V20 of the lung were 4.1%, 3.7%, and 3.9%, respectively.

Conclusion: Significant differences in dose distribution were observed among heterogeneity corrections. Attention needs to be paid to the differences.

Key words: Heterogeneity correction, Stereotactic body radiation therapy, Lung

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**EFFECT OF BREAST AUGMENTATION AFTER BREAST-CONSERVING SURGERY
FOR BREAST CANCER ON RADIATION DOSE
—SILICONE PROSTHESIS AND CHANGES IN RADIATION DOSE—**

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Abstract: The results of a study simulating postoperative radiation therapy of remaining breast tissue with a silicone bag prosthesis implanted to examine the effects of the prosthesis on radiation dosage and surrounding tissue are reported. The evaluation was conducted in two stages: 1) a water phantom was used to evaluate scattering effects of a prosthesis installed inside the phantom using GRD set around the prosthesis. Measurements were conducted on both entrance and rear sides of the prosthesis. 2) a Rand phantom was used to measure radiation doses around the prosthesis. The first evaluation resulted in a less than 5.4% reduction in dose at the rear side of the prosthesis whereas the second evaluation, for opposing portal irradiation used with breast-conserving surgical treatment, showed the effects of the prosthesis on radiation dosage being within $\pm 2\%$, the permitted treatment range. In conclusion, for treating breast cancer, combining surgical treatment of the cancer with implanting of prosthesis for breast reconstruction followed by radiation treatment appears feasible as no effects on dosage were observed on treatment effectiveness.

Key words: Breast cancer, Augmentation & reconstruction, Silicone prosthesis

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放射線治療を施行した直腸・肛門MALTリンパ腫の5例 —OCRO参加岡山大学関連多施設症例の検討—

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RADIOTHERAPY PERFORMED ON FIVE CASES OF RECTAL AND ANAL MALT LYMPHOMA —STUDY OF MULTICENTER (OKAYAMA CONFERENCE OF RADIATION ONCOLOGY: OCRO GROUP) CASES—

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Abstract: Rectal mucosa associated with lymphoid tissue (MALT) lymphoma is mainly treated by operation, endoscopic mucosal resection (EMR) and eradication of *Helicobacter pylori* (*H. pylori*), while only few cases are treated by radiotherapy. The OCRO (Okayama Conference of Radiation Oncology) group performed radiotherapy on five cases of rectal and anal MALT lymphoma performed radiotherapy. This is our report on these five cases with prognosis.

Five cases are all female and stage I_EA (Ann Arbor staging classification). Four had been are treated by other therapeutic procedure (eradication etc.) before radiotherapy.

Radiotherapy was performed 30–36 Gy (total dose) with slightly extended small pelvic field without one case (extended local field). No severe adverse effects were experienced.

Three cases of rectal pure MALT lymphoma of stage I survived over five years without recurrence. If eradication of *H. pylori* is not effective to rectal MALT lymphoma of stage I, our study suggests radiotherapy is one of the good therapeutic procedures for rectal (and anal) MALT lymphoma.

Key words: Rectal and anal MALT lymphoma, Radiotherapy, Eradication of *Helicobacter pylori*

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