Case 427

4. Paralytic ileus probably due to radiation ileitis

【Progress】

She was transported to university hospital for the purpose of receiving high pressure oxygen therapy for radiation adverse effect of ileitis.

【Discussion】

Radiation therapy has made great strides in the past thirty years associated with progress of computer technology. Radiation treatment is largely divided into extra beam radiation and brachytherapy. For extra beam radiation therapy, bilateral irradiation prevailed at first. Then, three-dimensional radiation treatment was performed, inducing multi-beam irradiation (stereotactic radiosurgery) and leading intensity modulated radiation therapy (IMRT) at present. Meanwhile, for brachytherapy, cobalt needles were used with remote after loading system (RALS) at first. Then, iridium needles are replaced with computer simulation, making dose-volume histogram.

For uterine cervical cancer, radiation treatment using extra beam radiation treatment and brachytherapy using applicators of ovoid and tandem with RALS, has been served: cobalt needle was used in the past and iridium needle, at present. In time when cobalt needles were used, dose volume distribution not only for tumor but also non-tumor areas surrounding tumor was not clear in the past because of no use of computer simulation system. Then, dose volume distribution for urinary bladder and/or small intestine was not clear in our case. Tolerant doses for small intestine and urinary bladder are V50 < 5% and V60 < 5%, respectively (1-3). Namely, V50 < 5% indicates that the dose volume of 50 Gy or greater should be less than 5% of the irradiated small intestine, otherwise, late adverse effects of small intestine would possibly occur. V60 < 5% indicates that the dose volume of 60 Gy or greater should be less than 5% of the irradiated urinary bladder, otherwise, late adverse effects of urinary bladder would possibly occur.

Radiation adverse effects are categorized into early and late. Early adverse effects occur within weeks, and the late adverse effects occur several months or decades later. Early adverse effects for irradiated small intestine are mucosal damages and hemorrhages while late adverse effects are sclerotic vessels and mural fibrosis inducing ischemic ulcer, sclerotic mural, lumen narrowing, mural necrosis and perforation (4-6). Our case experienced radiation treatment for uterine cervical cancer 40 years ago following uterine surgery.

It was unclear how much doses were given to small intestine or urinary bladder. Small intestine mural thickening and dilatation were depicted on abdomen CT, indicating no evidence of torsion ileus but adhesive ileus or radiation induced enteritis. Repeated passage disorder without clear occlusive point is thought to arise from radiation induced enteritis.

Hyperbaric oxygen therapy is anticipated as effective treatment for radiation induced hemorrhagic cystitis. Hyperbaric oxygen therapy is supplied in oxygen chamber by 100% oxygen under 2.4 air pressure for 80 minutes (7, 8).

In fact, there was one case of radiation -induced hemorrhagic cystitis whose symptoms improved after hyperbaric oxygen therapy. Our case had both radiation-induced cystitis and enteritis. Although hyperbaric oxygen therapy might be a trial stage at present, she would take service of hyperbaric oxygen therapy.

【Summary】

We presented an eighty-one-year-old female with abdominal fulness and pain. She had adhesive ileus several months ago. She had previously received radiation treatment and uterine surgery approximately 40 years before. Abdomen CT depicted small bowel dilatation and thickness of small bowel mural. Based on her history of receiving radiation therapy using remote after loading system and external radiation treatment, she was diagnosed with radiation enteritis and introduced to university hospital to receive hyperbaric oxygen therapy. It is borne in mind that the tolerant doses of small intestine and urinary bladder are V50 <5% and V60 < 5%, respectively. Hyperbaric oxygen therapy (HOT) is effective for radiation cystitis. However, the efficacy of HOT for radiation enteritis is unclarified but just trial.

【References】

1. Lage, L, et al. Radiation enteritis: Diagnostic and therapeutic issues. Journal of Visceral. Surgery2020; 157:475-485
2. Letschert, JG, et al. The volume effect in radiation-related late small bowel complications: results of a clinical study of the EORTC Radiotherapy Cooperative Group in patients treated for rectal carcinoma Radiother Oncol, 32 (1994), pp. 116-123
3. Nuhn, P.; Thuroff, J. Radiation-induced hemorrhagic cystitis-possible treatment options!. Urology 2022;61: 614–621
4. Dohm, A, et al. Strategies to Minimize Late Effects From Pelvic Radiotherapy. Am.Soc.Clin.Oncol.Educ.Book 2021;41: 158–168.
5. Webster, A. et al. Image-Guided Radiotherapy for Pelvic Cancers: A Review of Current Evidence and Clinical Utilisation. Clin. Oncol. 2020;32: 805–816.
6. Andreyev, J. Gastrointestinal complications of pelvic radiotherapy: Are they of any importance? Gut 2005;54: 1051–1054.
7. Yang TK, et al. Efficacy and Safety of Hyperbaric Oxygen Therapy for Radiation-Induced Hemorrhagic Cystitis: A Systematic Review and Meta-Analysis. J Clin Med. 2024 Aug 12;13(16):4724. doi: 10.3390/jcm13164724
8. Cardinal, J, et al. Scoping Review and Meta-analysis of Hyperbaric Oxygen Therapy for Radiation-Induced Hemorrhagic Cystitis. Curr.Url. Rep.2018; 19:38

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