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Editorial

Comments on: Safety and efficacy of 3D-printed templates assisted CT-guided radioactive iodine-125 seed implantation for the treatment of recurrent cervical carcinoma after external beam radiotherapy

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In general, the main treatments for cervical cancer are surgery and radiation therapy, and in advanced cases, anticancer drugs are used. Although various treatment methods for recurrent cervical cancer is being presented, there are no standardized treatment methods [1]. In particular, if the patient has a local recurrence of the pelvis that already had radiation therapy, there is a high possibility of serious side effects such as bowel perforation due to higher dose delivery to the surrounding normal intestine, bladder, and rectum by retreatment. In most cases, it is difficult to apply additional external radiation therapy [2,3].

Therefore, there are reports that a high-dose treatment method such as Stereotactic Body Radiation Therapy is applied to solve this problem, but there is a limitation that it is difficult to irradiate a large amount of radiation to the target site [4,5]. In 2002, China already introduced a method called low dose rate brachytherapy to solve this problem. This method utilized the permanent implantation technique used in prostate cancer. It was applied to various cancers such as recurrent cervical cancer and rectal cancer which local metastasis in pelvis occur [6,7].

Permanent implantation used in prostate cancer has been applied as an alternative to surgery, mainly in the low-risk or intermediate-risk group. In the high-risk group, it was applied in combination with external radiation therapy. This has already been recognized as one of the main treatments for prostate cancer that is widely practiced in the United States and Europe [8]. According to the report of 2004, only 3.1% used brachytherapy in 1989–1992. After that, it gradually increased to 21.7% in 1999–2001. It was reported to be used in 31.1% especially for patients over 75 years [9].

The advantage of brachytherapy using iodine-125 (I-125) radioisotope is that it is possible to increase local control rate and minimize side effects. While surrounding normal tissue or organs are minimally irradiated, the prostate, which is the target treatment site, is irradiated with a large amount of radiation. In addition, the hospitalization period is shorter than

surgery, and side effects such as urinary incontinence and sexual dysfunction caused by surgery can be minimized [10].

On the other hand, the disadvantage is that it requires a technically experienced experts to accurately insert I-125 seed. In order to reduce side effects of the surrounding major organs, such as the rectum and urinary tract, not only anatomical knowledge of normal organs but also sophisticated techniques are required. If not, it is known to increase the likelihood of severe proctitis, fistula formation and the resulting dysuria due to inflammation of the urethra [11].

Brachytherapy using I-125 radioisotopes has been proven to be a very effective treatment in prostate cancer, as the overall survival rate as well as local control rate had been showed to be almost the same level as surgery [12]. On the other hand, when applied to other tumors such as recurrent cervical cancer with intrapelvic metastasis, this study reported a very high local control rate [13]. But in most cases distant metastases was accompanied, so there was no significant difference with the overall survival rate. This shows that the patients who fall into this study, that is, those who have already received intrapelvic radiotherapy for recurrent cervical cancer are eligible to a method that can increase the local control rate. In such cases, it is considered that it can be used safely and efficiently as a palliative salvage treatment method.

However, high-performance technique for inserting radioisotope is prerequisite in order to apply I-125 brachytherapy. In prostate cancer, transrectal ultrasonography is used to perform the procedure while confirming whether the needle is correctly inserted into the prostate, which makes it relatively easy to access. As for this study, computer tomography (CT) using 3D-printed noncoplanar template was adopted for confirmation. Even if an accurate simulation is performed before the procedure, the possibility of an error still looms making it mandatory to constantly monitor. Avoiding the risk of radiation exposure from frequent CT scans during procedure is also required.

Although there are various restrictions, brachytherapy using I-125 radioisotope can be applied safely and effectively as a remedy for local recurrent cervical cancer in the pelvis. To this end, an efficient method that can accurately and swiftly insert the isotope should be developed.

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