Penentuan kesalahan sistematik dan acak untuk mendapatkan margin PTV pada radioterapi kanker serviks uteri di RSCM = Determination of sistematic and random erros for acquire PTV margin of cervical cancer irradiation in Cipto Mangunkusumo hospital

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Abstrak

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Pendahuluan : Radioterapi kanker serviks uteri dalam pelaksanaannya memerlukan verifikasi geometri sebagai salah satu rantai prosedur radioterapi. Prosedur ini dilakukan untuk mengetahui kesalahan set-up yang terdiri dari kesalahan sistematik dan acak yang nantinya digunakan untuk menentukan margin PTV yang sesuai untuk radioterapi kanker serviks uteri di Departemen Radioterapi Rumah Sakit dr. Cipto Mangunkusumo (RSCM)

Metode : Penelitian ini merupakan studi potong lintang terhadap data verifikasi dengan Electronic Portal Imaging Devices (EPID) dari 9 pasien kanker serviks uteri yang mendapatkan radioterapi dengan teknik 3DCRT/IMRT di Departemen Radioterapi RSCM antara bulan Oktober 2013 hingga Desember 2013. Pergeseran pada lapangan radiasi yang didapatkan dari hasil verifikasi dalam tiga fraksi awal dianalisis untuk memperoleh kesalahan sistematik dan acak, yang selanjutnya dihitung untuk mendapatkan margin PTV.

Hasil : Sebanyak 72 data verifikasi EPID dianalisis. Didapatkan kesalahan sistematik dan kesalahan acak pada pelaksanaan radiasi (radioterapi) kanker serviks uteri di Departemen Radioterapi RSCM, berturut-turut sebesar 3.8 dan 3.0mm pada sumbu laterolateral, 5.9 dan 2.6mm pada sumbu kraniokaudal, serta 4.3 dan 3.5mm pada sumbu anteroposterior. Margin PTV yang diperoleh sebesar 9.8mm, 13.5mm dan 11,0 mm untuk masing-masing sumbu laterolateral, kraniokaudal, dan anteroposterior.

Kesimpulan : Hasil penelitian ini mendapatkan kesalahan sistematik dan acak menggunakan verifikasi dengan EPID yang digunakan sebagai rekomendasi pemberian margin PTV sebesar 13.5mm dalam pelaksanaan radioterapi kanker serviks uteri dengan teknik 3DCRT/IMRT di Departemen Radioterapi RSCM. Diperlukan alat imobilisasi khusus regio pelvis untuk meningkatkan akurasi penyinaran.
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ABSTRACT
Introduction : Geometric verification is needed as a part of chain of radiotherapy procedures in cervical cancer irradiation. This procedure used to detect set-up erros contains sistematic and random errors for the next step use to formulating adequate PTV margin for cervical cancer irradiation in Cipto Mangunkusumo Hospital

Methods : This is a cross-sectional study using Electronic Portal Imaging Devices (EPID) verification data of 9 cervical cancer patients treated with 3DCRT/IMRT in Department of Radiotherapy, Cipto

Mangunkusumo Hospital between October 2013 and December 2013. Translation errors from the first three fractions were analyzed to count for systematic and random errors. These errors were then calculated to acquire PTV margin.

Results : A total of 72 EPID data were analyzed. Systematic and random errors for cervical cancer irradiation in this study were respectively 3.8mm and 3.0mm in laterolateral direction, 5.9mm and 2.6mm in craniocaudal direction, and 4.3mm and 3.5mm in anteroposterior direction. PTV margin were 9.8mm, 13.5mm and 11.0mm in laterolateral, craniocaudal and anteroposterior direction, respectively.

Conclusions : The result in this study acquire systematic and random errors with verificaton by EPID gave PTV margin recommendation and showed that 13.5mm margin was adequate in planning 3DCRT/IMRT technique for cervical cancer in Department of Radiotherapy, Cipto Mangunkusumo Hospital. Immobilisation devices for pelvic region might be needed to improve the accuration of radiotherapy.
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