

Dosimetri penyinaran volumetric modulation arc therapy (VMAT) dengan teknik full arc dan half arc pada RANDO phantom = Dosimetric of full arc and half arc volumetric modulation arc therapy(VMAT) at RANDO phantom

Yahya Mustofa, author

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Abstrak

[ABSTRAK

Volumetric Modulation Arc Therapy (VMAT) merupakan salah satu modalitas untuk pengobatan kanker yang mempunyai beberapa teknik penyinaran. Dalam penelitian dilakukan karakteristik dosimetri dan dosimetri invivo menggunakan TLD-100 rod dan film gafchromic EBT3 dengan teknik full arc dan half arc VMAT pada fantom rando kasus kanker parotid kiri dan kanker paru ? paru apeks kiri yang masing - masing memiliki empat target dengan volume yang berbeda. Evaluasi yang dilakukan meliputi parameter penyinaran, Homogeneity Index (HI), Conformity Index (CI) dan deviasi pengukuran dosis menggunakan TLD dan film dengan TPS. Total MU yang digunakan dan waktu penyinaran, teknik full arc lebih besar dibandingkan teknik half arc. Selain itu, laju dosis yang diperlukan untuk VMAT teknik full-arc lebih rendah dibandingkan dengan teknik half arc, Teknik full arc lebih homogen dan konformitas dibandingkan pada teknik half arc. Pada pengukuran dosis titik menunjukkan bahwa teknik full-arc dan half-arc mempunyai nilai deviasi yang tidak besar, dan penggunaan TLD lebih efektif jika dibandingkan dengan film, dimana rata ? rata deviasi dosis penggunaan TLD antara 3,79 ? 5,76 % untuk target dan 6,38 ? 9,3 % untuk organ at risk (OAR), dan pada penggunaan film antara 5,69 ? 11,85 % untuk target dan 34,40 ? 215,76 % untuk OAR.

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ABSTRACT

Volumetric Modulation Arc Therapy (VMAT) is one of the modalities for cancer treatment that have some technique. This study conducted, dosimetry characterizations and determination dose by TLD and gafchromic EBT3 film with full arc and half arc VMAT technique at rando phantom for left parotid cancer and left apex lung cancer case, which each case have four target different volumes. Evaluation was conducted on the irradiation parameters, homogeneity index (HI), Conformity Index (CI) and the deviation of dose measurement using TLD and films with TPS. On VMAT, the total MU which used and the total of delivery treatment time, on full arc technique is greater than the half arc technique. Results of the study the dose rate necessary for VMAT technique of full arc lower than the technique of half arc, VMAT technique full arc more homogeneous and conformity compared to the technique of half arc. The measurement of the dose point of use TLD is more effective than the use of the film, where deviations dose average using TLD between

3.79 to 5.76 % for target and 6.36 to 9.3 % for organ at risk (OAR), and the use of film between 5.69 to 11.85 % for target and 34.4 to 215.76 % for OAR.; Volumetric Modulation Arc Therapy (VMAT) is one of the modalities for cancer treatment that have some technique. This study conducted, dosimetry characterizations and determination dose by TLD and gafchromic EBT3 film with full arc and half arc VMAT technique at rando phantom for left parotid cancer and left apex lung cancer case, which each case have four target different volumes. Evaluation was conducted on the irradiation parameters, homogeneity index (HI), Conformity Index (CI) and the deviation of dose measurement using TLD and films with TPS. On VMAT, the total MU which used and the total of delivery treatment time, on full arc technique is greater than the half arc technique. Results of the study the dose rate necessary for VMAT technique of full arc lower than the technique of half arc, VMAT technique full arc more homogeneous and conformity compared to the technique of half arc. The measurement of the dose point of use TLD is more effective than the use of the film, where deviations dose average using TLD between 3.79 to 5.76 % for target and 6.36 to 9.3 % for organ at risk (OAR), and the use of film between 5.69 to 11.85 % for target and 34.4 to 215.76 % for OAR., Volumetric Modulation Arc Therapy (VMAT) is one of the modalities for cancer treatment that have some technique. This study conducted, dosimetry characterizations and determination dose by TLD and gafchromic EBT3 film with full arc and half arc VMAT technique at rando phantom for left parotid cancer and left apex lung cancer case, which each case have four target different volumes. Evaluation was conducted on the irradiation parameters, homogeneity index (HI), Conformity Index (CI) and the deviation of dose measurement using TLD and films with TPS. On VMAT, the total MU which used and the total of delivery treatment time, on full arc technique is greater than the half arc technique. Results of the study the dose rate necessary for VMAT technique of full arc lower than the technique of half arc, VMAT technique full arc more homogeneous and conformity compared to the technique of half arc. The measurement of the dose point of use TLD is more effective than the use of the film, where deviations dose average using TLD between 3.79 to 5.76 % for target and 6.36 to 9.3 % for organ at risk (OAR), and the use of film between 5.69 to 11.85 % for target and 34.4 to 215.76 % for OAR.]