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Suplementary Information:

Implementation of AAPM TG-218 for Patient Specific Quality Assurance (PSQA) in The Case of Thoracic Target Region using IMRT Radiotherapy Technique with EPID aSi-1200

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Calibration of Electronic Portal Imaging Device

In this study, Before PSQA data collection, dark field and flood field calibration is performed on EPID. This calibration is carried out automatically by the EPID system as a normalization of data collection, so that the fluence image from the planning displayed in the form of digital data can be ensured for its accuracy. After that, it is necessary to measure the absolute dose output which includes linearity with delivered and linearity with dose rate. Measurements of dose linearity with delivered and linearity with dose rate dependence on EPID dosimetry were carried out to ensure that the EPID conditions were in accordance with the manufacturer's radiation output standards. Measurements were made on the EPID dose linearity in the MU range of 50 - 400 with an dose rate of 400 MU/min in a 10 x 10 cm^2 field as seen in Table 1. The difference between the MU value and the dose rate is 1% (see Table 1). The linear regression value (R^2) can be seen in Fig. 1 that the R^2 value produced is more than 0.999, so it can be concluded that the increase in the dose of measurement results is linear with the increase in the MU value on the Linac.

Table 1. Dose Linearity Value

MU	EPID Dose (Gy)
50	0.4998
100	1.0098
150	1.5092
200	1.9998
250	2.4978
300	3.0002
350	3.4977
400	4.0012

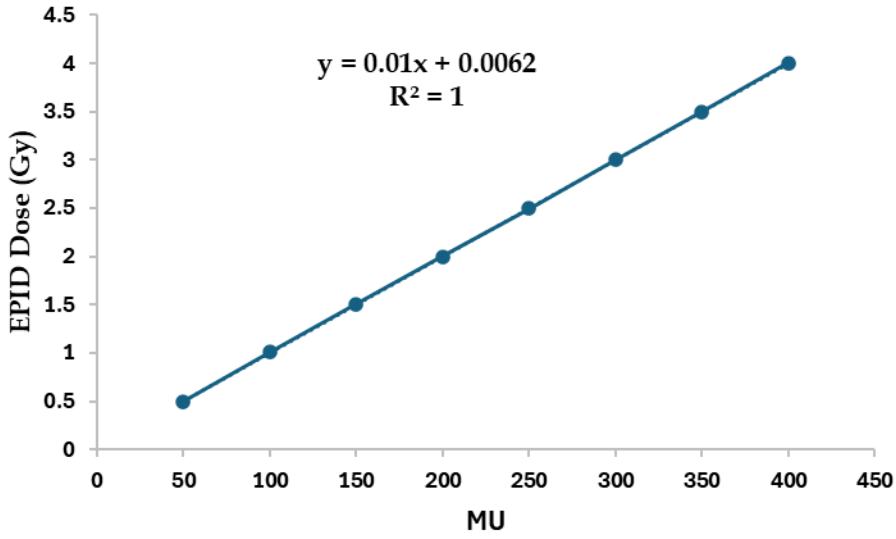

Figure 1. EPID dosimetry linearity graph

The results of the dose rate dependence measurement as shown in Table 2, show that the EPID dosimetry measurement dose does not depend on the change in the dose rate value. The measurement was carried out using 100 MU with a dose rate variation of 100 - 600 MU/min in a 10 x 10 cm^2 field. The difference in the measurement value results with those set for Linac showed the largest deviation at the dose rate of 400 MU/min with a value of -0.71% against the Linac dose of 100 MU. The mean deviation value of all dose rate variation data is 0.0011.

Table 2. Data on Dose Rate Dependence Value

Dose Rate (MU/min)	**Dose (Gy)**
100	1.0040
200	1.0055
300	1.0067
400	1.0071
500	1.0062
600	1.0054
Average	1.0058
Deviation	0.0011