

ABSTRACT

Radiotherapy using the Intensity Modulated Radiation Therapy (IMRT) technique requires a patient-specific quality assurance (PSQA) process to ensure agreement between the planned dose and delivered dose. One commonly used dose verification method is the Electronic Portal Imaging Device (EPID). This study aimed to analyze the Gamma Index Passing Rate in IMRT dose verification for left breast cancer using EPID at the Radiotherapy Department of the Radiology Installation, RSPAU dr. S. Hardjolukito. This study employed a quantitative descriptive method with a retrospective approach and total sampling technique. The data consisted of all available PSQA data from left breast cancer patients undergoing IMRT treatment during January–March 2026, with a total of 18 patient data. Dose verification was performed using EPID on a Varian LINAC system. Gamma index analysis was conducted using 3%/3 mm and 3%/2 mm gamma criteria with a 10% Dose Threshold. The analyzed parameters included Gamma Index Passing Rate, Maximum Gamma, Average Gamma, and passing rate category distribution. The results showed that all data had Gamma Index Passing Rates above the AAPM TG-218 tolerance standard of $\geq 95\%$. The mean Gamma Index Passing Rate for the 3%/3 mm criterion was 99,67% with a standard deviation of 0,49, while for the 3%/2 mm criterion it was 99,05% with a standard deviation of 0,86. The highest Maximum Gamma value reached 10 in the 3%/2 mm criterion, but it did not affect the overall passing rate. Most data were categorized as excellent, with Gamma Index Passing Rate values $\geq 99\%$. Based on these results, EPID can be used as an effective and reliable PSQA method for IMRT dose verification in left breast cancer at RSPAU dr. S. Hardjolukito.

Keywords: *EPID, gamma index, IMRT, passing rate, patient-specific quality assurance.*