FEASIBILITY STUDY OF LOG-FILE BASED PATIENT SPECIFIC QUALITY ASSURANCE (PSQA) FOR VMAT PELVIS CASES: A RETROSPECTIVE, SINGLE CENTRE STUDY

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01 INTRODUCTION

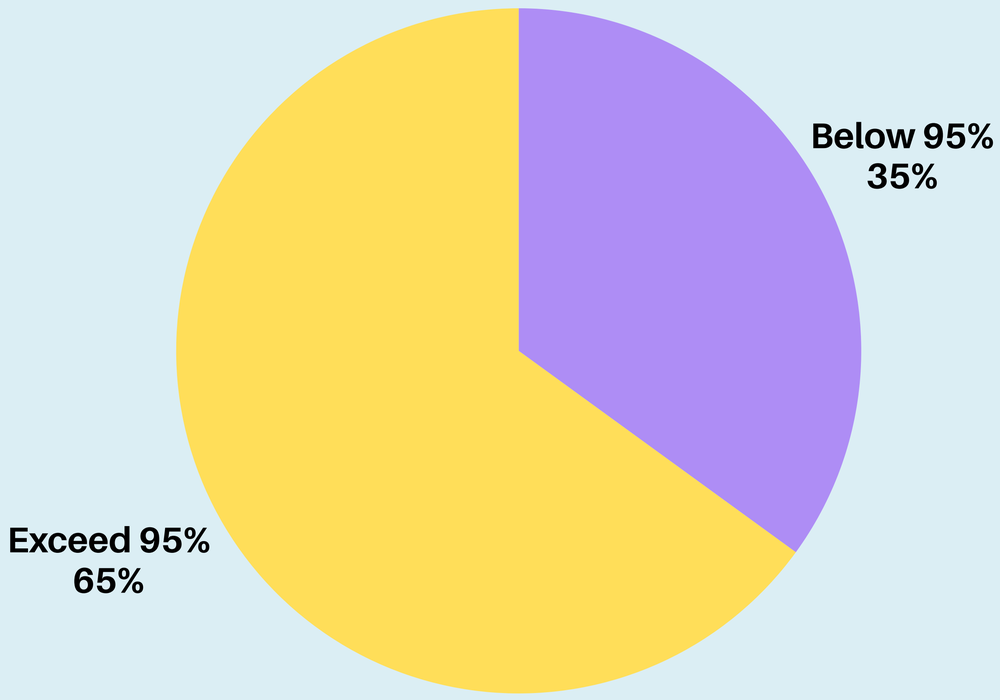
Patient-specific quality assurance (PSQA) is essential in radiotherapy to ensure accurate and safe dose delivery. Mobius 3D as a log-file based independent dose verification software that uses gamma index analysis to evaluate agreement between dose distributions calculated by different algorithms. Previous studies have indicated its suitability as a primary PSQA tool for Volumetric Modulated Arc Therapy (VMAT) cases. However, its performance and reliability for 10 MV photon beams remain areas of ongoing investigation.

02 METHODOLOGY & MATERIAL

In this retrospective study, 40 VMAT pelvic cases with varying patient separations, all of which had passed EPID-based PSQA, were selected. Treatment plans were generated using Eclipse 17.0 and 18.0 treatment planning systems with 10 MV photon beams and imported into Mobius 3D. Gamma index analysis was performed using Dose Difference (DD) and Distance-to-Agreement (DTA) criteria of 5%/3 mm with a 10% threshold, as recommended by Mobius 3D commissioning guidelines. The gamma passing rate (GPR) for each plan was obtained, and the mean GPR was analyzed to evaluate software performance.

03 RESULTS & DISCUSSION

GAMMA PASSING RATE (GPR)



Exceeds GPR 95%	Below GPR 95%	Standard Deviation	Mean
26	14	± 2.85%	95.89%

All plans met the minimum acceptance criterion of 90%

These findings indicate that Mobius 3D provides reliable and consistent PSQA results across different patient separations for 10 MV photon VMAT pelvic treatments. Its integration into the clinical workflow offers significant advantages, including reduced PSQA time and decreased labor-intensive tasks.

04 CONCLUSION

Mobius 3D demonstrates clinically acceptable performance for VMAT pelvic cases. These results support the continued use of Mobius 3D as an efficient and dependable tool for patient-specific quality assurance in radiotherapy.

05 REFERENCES

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