BRAIN

CLINICAL PUBLICATION BRIEF

Plan Quality Assessment of Fractionated Stereotactic Radiotherapy Treatment Plans in Patients With Brain Metastases

FULL ARTICLE

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OBJECTIVE

To assess treatment plan quality and clinical acceptability of fractionated stereotactic radiotherapy (FSRT) for brain metastases using CQ Medical open-face mask immobilization.

SUMMARY

This retrospective analysis evaluated 24 FSRT treatment plans in 23 patients with brain metastases where patients were treated with a mono-isocenter VMAT approach, and positioning devices included CQ Medical open face masks and the HexaPOD robotic couch. To evaluate plan conformity and precision, researchers analyzed conformity indices, gradient index, homogeneity index, quality index, and the volume of normal brain receiving ≥ 24.4 Gy.

CLINICAL IMPACTS

- Open face masks significantly reduce patient fear and enhance comfort compared to invasive head frames.
- OAR (organs at risk) constraints were met in all plans across a wide range of PTV sizes.
- Treating multiple metastases with a single isocenter is feasible and clinically acceptable, which could improve throughput and simplify planning in complex cases.

KEY TAKEAWAYS

CONFORMITY Plans demonstrated high target coverage and precision: Mean RTOG CI = 0.942, mean Paddick CI = 0.824.

PRECISION The technique achieves sharp dose fall-off and acceptable dose homogeneity, protecting healthy brain tissue: Mean GI = 6.146; Mean HI = 1.263.

CONSISTENCY The approach reliably meets clinical standards across different tumor volumes (from ~1.2 cm^3 to ~60 cm^3), unifying workflow with a Homogeneity Index mean of 1.263 and stable quality metrics.

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