**IMRT technique combined with moving junction used in craniospinal irradiation**

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**Purpose**
The purpose of this study is to evaluate the Intensity Modulated Radiation Therapy (IMRT) used in craniospinal irradiation (CSI).

**Materials and Methods**
Five patients with brain tumor were including in this study. All patients underwent CT simulation in prone position. The IMRT plan was generated for each patient using Eclipse treatment planning system (Version 8.6) as well as conventional three-dimensional Radiotherapy (3D-CRT) plan. In all plan, a total dose of 36Gy in 20 daily fractions. The PTV was divided to PTV-brain and PTV-spine. The organ at risk (OAR) including eyes, thyroid, heart, lungs, esophagus, liver and kidneys. Conventional 3DCRT plan employing two bilateral half-beam blocked cranial fields, collimated to match the divergence of the direct posterior spinal field. The IMRT plan using five posterior fields with gantry of 0, ±20, ±50° for the spinal field. We also shift the junction in IMRT plan to cover the set-up error.

The dosimetric outcomes of 3D-CRT and IMRT were compared quantitatively using dose-volume indices in terms of target volume coverage, dose homogeneity, dose conformity.

**Results and discussions**
The 3D-CRT plan showed the higher dose heterogeneity in two techniques. The target volume coverage represented by $V_{95}$ was $>99\%$ in all plans excluding the PTV-spine using 3DCRT (82.91%). The dose homogeneity index (DHI) of PTV-Brain using 3D-CRT and IMRT was 0.94 and 0.96 respectively. For PTV-spine, the DHI using 3D-CRT and IMRT was 0.85 and 0.94 respectively. The conformity index (CI) of PTV-Brain using 3D-CRT and IMRT was 2.16 and 1.89 respectively. For PTV-spine, the CI using 3D-CRT and IMRT was 66.84 and 3.03 respectively. The 3D-CRT plan show the higher maximum dose in most OAR, and IMRT plan show the higher mean dose than 3DCRT.

**Conclusion**
The IMRT plan show the greater dose coverage and dose homogeneity than 3D-CRT plan in all PTV. The moving junction is still needed for set-up error and IGRT is suggestion for treatment delivery. The longer beam-on time of IMRT may raise intrafractional motion and much low-dose region of OAR may raises secondary cancer.