

Complications after stereotactic radiosurgery for brain metastases: Incidences and correlating factors

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Purpose

Stereotactic radiosurgery (SRS) has been widely applied to the management of brain metastasis (BM) patients. We present incidences of and factors correlating with post-SRS complications.

Materials and Methods

This was an institutional review board-approved, retrospective cohort study using our prospectively accumulated database including 2966 patients (1792 males, 1174 females, mean age; 65 [range; 19-96] years) who underwent gamma knife SRS for BMs during the 1998-2016 period. Median and mean tumor numbers were 3 and 7 (maximum; 89, IQR; 1-8). Median cumulative tumor volume was 4.9 (range; 0.01-126.2, IQR; 1.63-11.7) cc and median volume of the largest tumor was 3.3 (range; 0.01-94.2, IQR; 0.93-7.7) cc. The median maximum dose was 35 (range; 15-60, IQR; 30-40) Gy.

Results

The overall median survival time after SRS was 7.8 (95% CI; 7.4-8.1) months. Post-SRS complications occurred in 86 patients (2.9%) 1.9-211.4 (median; 24.0, IQR; 12.0-64.6) months after treatment. Univariable analysis showed cumulative tumor volume <5 cc (HR; 2.372, 95% CI; 1.541-3.681, p<0.0001), volume of the largest tumor <3.3 cc (HR; 2.302, 95% CI; 1.495-3.591, p=0.0001), maximum dose <35 Gy (HR; 1.632, 95% CI; 1.042-2.630, p=0.0320), brain volume receiving ≥12.0 Gy of <30.0 cc (HR; 2.281, 95% CI; 1.475-3.539, p=0.0002) to be factors associated with a lower incidence of complications. However, multivariable analysis showed no significant correlation with the complication.

Conclusion

The post-SRS complication incidence is considered to be acceptably low (2.9%). Multivariable analysis showed no significant correlating factors with the complication.