

of BN20 domains and single items worsened 3 months after VMAT except headaches ($p = 0.046$) and bladder control ($p = 0.26$) which improved.

Conclusions: The delivery of 40 Gy in 10 fractions to 1–4 BM using VMAT was achieved with no significant toxicity. QoL, performance status, but not MMSE, was however compromised 3 months after treatment in this selected cohort of BM patients.

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POSTER

Robotic Stereotactic Radiotherapy in Patients With Glomus Tumours

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Background: To assess the feasibility of radiotherapy with robotic stereotactic radiotherapy (RSR) in patients with glomus jugulare and caroticum.

Material and Methods: We treated 20 patients with glomus tumours using RSR in our department between June 2007 and September 2010. Two patients were male, and 18 were female. Fifteen patients had glomus jugulare, and 5 patients had glomus caroticum. Median age was 60 years (range, 29–79). RSR was delivered with CyberKnife (Accuray Inc., Sunnyvale, CA). Median tumour volume was 16.1 cc (2.12–96 cc). Total dose of 18–30.78 Gy (median 25 Gy) was delivered in median 5 fractions (1–5 fractions). The gross tumour volume was described as the clinical target volume. Median homogeneity and conformality indices were 1.25 (1.0–1.46) and 1.6 (1.29–3.02) respectively. The median maximum doses of right optic and left optic nerve, optic chiasm, and brain stem are 3 Gy (0–10.3 Gy), 4.11 Gy (1.5–10.7 Gy), 5.08 Gy (0.77–16.6 Gy), and 18.8 Gy (3.3–31.2 Gy), respectively. All lesions were evaluated via magnetic resonance imaging during follow-up.

Results: Median follow-up was 21.5 months (range, 3–44 months). One patient was lost to follow-up. Lesions were stable in 13 patients, whereas partial response was observed in 6 patients. Complete symptomatic response was observed in 8 patients at the third month of follow-up. Treatment related toxicity was observed in three patients (1 facial paralysis and 2 decreased hearing).

Conclusion: Fractionated RSR seems to be an appealing treatment option with minimal serious toxicity.

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POSTER

Retrospective Analysis of Patients With Brain Metastases Treated With Robotic Stereotactic Radiotherapy

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Background: To evaluate the therapeutic outcome of patients with brain metastases treated via robotic stereotactic radiotherapy (RSR).

Materials and Methods: We treated 183 patients with brain metastases via RSR in our department between June 2007 and September 2010. Patients having ≥ 6 lesions were not included in this analysis. One hundred and nine patients were male, and 94 were female. Median age was 55 years (range= 19–84). Primary diagnosis was lung cancer in 50% of patients, and breast cancer in 26%. RPA classes of patients before RSR were class I in 32%, class II and III in 53% and 9% of patients respectively. 62% of patients had solitary lesion, whereas 29% had 2–3 lesions, and 9% had 4–5 lesions. The prescribed doses were 12–32 Gy (median 18 Gy) in solitary lesions. The median prescribed doses were 18 Gy (range, 12–35 Gy) and 22.8 Gy (range, 15–25) in patients with 2–3 lesions and 4–5 lesions respectively. The median fraction number was one (range, 1–5 fractions). The median homogeneity and conformality indices were 1.2 and 1.6, respectively.

Results: Median follow-up was 10 months (1–34 months). According to primary diagnosis (lung cancer, breast cancer, others) there was a significant difference in overall survival rates (46%, 37%, and 16%, $p = 0.02$). Local and regional control rates were 53%, and there was no difference between the groups. Symptomatic overall response rate was 52%. According to number of lesions (1 lesion vs. 2–3 lesions), no significant difference was observed between groups regarding response rates and toxicities. Groups were rearranged according to number of lesions (< 4 vs. ≥ 4) and a significant difference in symptomatic response to treatment was observed in favor of < 4 lesions group. The total dose was calculated as biologic equivalent dose of 2 Gy (BED₂), and in patients with BED₂ > 220 Gy the local control rates were significantly better ($p = 0.005$). However the late toxicity rate was also higher in this group ($p = 0.005$).

Conclusion: RSR is an efficient treatment modality for patients with brain metastases. We observed that BED₂ dose over 220 Gy seems to be more effective in terms of local control, but also increases the late toxicity.

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POSTER

Hypofractionated Radiotherapy in Glioblastoma Multiforme With Poor Prognostic Factors – a Prospective Randomized Single Institute Experience

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Aims: To evaluate the effect of hypofractionated radiotherapy in terms of overall survival, quality of life and acute toxicities encountered in patients of Glioblastoma Multiforme (GBM) with poor prognostic factors.

Materials and Methods: From Jan 2010 to Dec 2010, 70 patients were randomized after surgery to receive either a short course of radiotherapy with dose of 35 Gy /10#/2 weeks or standard radiotherapy with dose of 60 Gy/30#/6 weeks. The patients were selected on the basis of selection criteria i.e. age > 50 years, KPS < 70 and histology-GBM. Target volumes were described on the basis of preoperative MRIs. A margin of 3 cm was given around the visible gross tumour and edema. The primary end point was overall survival and secondary end points were acute toxicity encountered and QOL assessment.

Results: The median survival was 31 weeks ($p = 0.692$). Acute toxicities were comparable and QOL after applying EORTC-QLQ 30C and BN-20 questionnaire was good.

Conclusion: Hypofractionated radiotherapy with brain irradiation is well tolerated with palliative benefits. Conventional radiotherapy has similar outcome, however many patients having poor prognostic factors actually cannot undergo such long treatment and for these patients this hypofractionated regime can proven objectively and logistically a good practical option.

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POSTER

Factors Predictive of Complete Nidus Obliteration Following Linear-accelerator-based Stereotactic Radiosurgery for Intracerebral Arteriovenous Malformations

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Background: To investigate predictive factors of complete nidus obliteration following treatment with linear accelerator-based stereotactic radiosurgery for intracerebral arteriovenous malformations.

Materials and Methods: Archived plans for 48 patients who were treated at the British Columbia Cancer Agency and who had undergone post-treatment digital subtraction angiography to assess nidus obliteration were studied. Actuarial estimates of complete obliteration were calculated using the Kaplan–Meier method. Univariate and multivariate Cox proportional hazards models were used for analysis of incidence of obliteration. Log-rank test was used to search for parameters associated with complete nidus obliteration.

Results: Complete nidus obliteration was achieved in 38/48 patients (79.2%). The actuarial rate of obliteration was 75.9% at 4 years (95% confidence interval 63.1%–88.6%). On univariate analysis, prescribed dose to the margin ($p = 0.002$) and dose to isocentre ($p = 0.022$) showed statistical significance. None of the parameters showed statistical significance in a multivariate model. According to the log-rank test, prescribed dose to the margin of > 20 Gy ($p = 0.004$) and dose to the isocentre of > 25 Gy ($p = 0.004$) were strongly associated with complete obliteration. The actuarial rate of obliteration in patients with prescription dose equal to or larger than 20 Gy and a lesion volume of 10 cc or less was 91.6%. In patients where one of these conditions was not met, the obliteration rate was 60.9% ($p = 0.033$).

Conclusion: Reported series in the literature suggest a number of different factors are predictive of complete obliteration of arteriovenous malformations following radiosurgery. However, differing definitions of volume and complete obliteration makes direct comparison between series difficult. This study demonstrates that complete obliteration of the nidus following linear accelerator-based stereotactic radiosurgery for arteriovenous malformations appears to be most closely related to the prescribed marginal dose. In particular, a marginal dose of > 20 Gy is strongly associated with obtaining complete obliteration of the nidus.