AbstractID: 8920 Title: Image-Guided Stereotactic Spinal Radiosurgery with a Conventional Linear-Accelerator

**Purpose:** As large experiences of spinal radiosurgery were reported by using CyberKnife, this study evaluates our experiences with spinal radiosurgery given by a conventional linear-accelerator, utilizing the featureso f KV-OBI and CBCT. **Method and Materials:** Image-guided stereotactic radiosurgery is used in our clinic to treat spinal metastases with 16-18 Gy in a single-fraction, or 20-30 Gy in 5-fractions. Treatment is delivered using nine co-planar IMRT-beams in 20-25 minutes. The success of spinal radiosurgery requires sparing of the proximal spinal cord and high precision of dose delivery. With proper beam arrangement and dose optimization, the maximal cord dose can be minimized to 60-65% of the prescription dose. Stereotactic localization of the metastatic vertebrae-body is achieved by KV-OBI and CBCT guidance before and during the treatment. The shifts based on OBI#1 are made from the skin marks after initial setup. Next, CBCT further verifies the patient alignment. Two more OBIs before every three fields ensure patient immobility and allow iso shifts if necessary. **Results:** Couch shifts were recorded for a sample of 12 patients, a total of 27 fractions in this evaluation. It is found that the ranges of the shifts guided by OBI#1 from skin marks are: 1.4 cm longitudinal, 0.9 cm vertical, 0.7 cm lateral, and 2° in-plane couch rotation, while CBCT and consecutive OBI#2 and #3 before every three fields found little patient movements. **Conclusion**: The conventional linear-accelerator is able to deliver stereotactic radiosurgery treatment of spinal metastases with a high degree of accuracy, as guided by OBI and CBCT image techniques, in combination with proper patient setup, immobilization, and skin marks. No body-wrap or fiducials are necessary in our approach. The study also finds that OBI and CBCT are equivalent due to the proper patient setup procedures in our approach. CBCT is beneficial for localizing C7/T1 for treatment.