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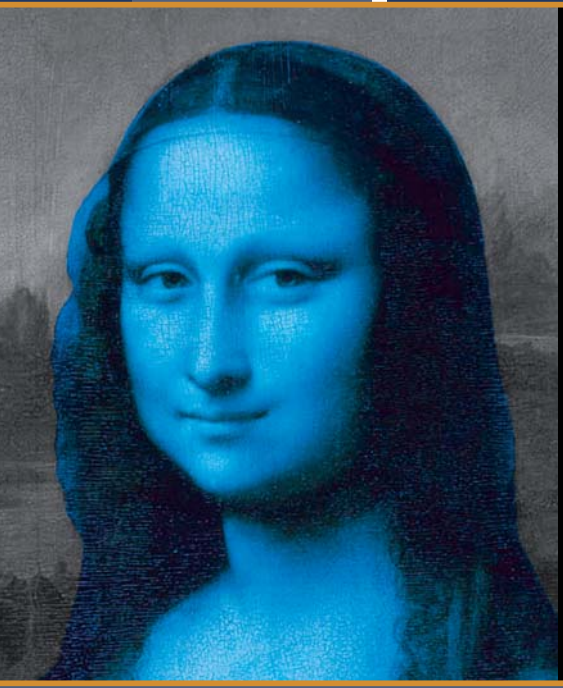

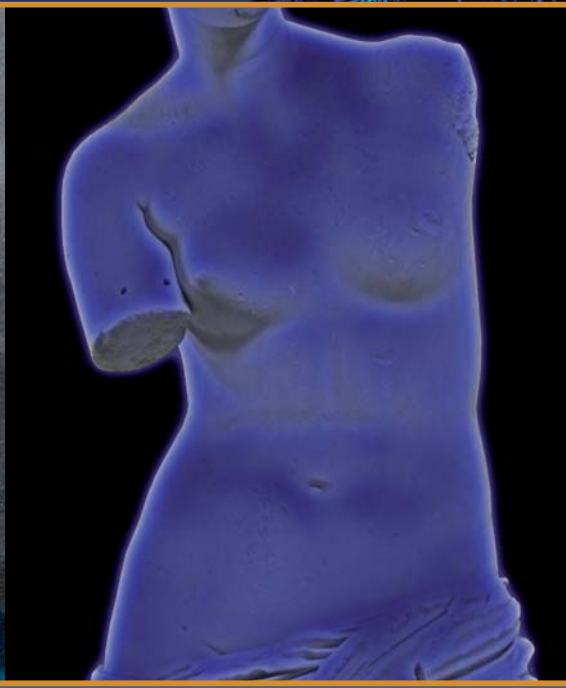

10TH INTERNATIONAL STEREOTACTIC RADIOSURGERY SOCIETY CONGRESS

Brain & Body Radiosurgery

ABSTRACTS BOOK

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FIRST INDIAN EXPERIENCE WITH SHAPED BEAM RADIOSURGERY OF CRANIAL AND SPINAL LESIONS ON NOVALIX TX LINEAR ACCELERATOR WITH EXAC TRAC 6D ROBOTIC COUCH

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Objective: To present the initial experience of streretactic radiosurgery treatment of cranial and spinal lesions with Novalis Tx at Apollo Cancer Hospital, Hyderabad, India.

Methods: From May to October 2010, thirty three patients (8 arteriovenous malformations, 10 vestibular schwannomas, 2 trigeminal schwannomas, 3 meningiomas, 2 pituitary adenomas, 4 brain metastases and 4 spine metastases) were treated with stereotactic radiosurgery. 3D volumetric MR imaging was performed for every patient and was fused with high resolution (0.75mm thickness) stereotactic CT images on Brain Lab, iPlan planning system. Twenty two patients were considered for Frameless radiosurgery using BrainLab thermoplastic mask and ExacTrac 6 degree-of-freedom (6-D) robotic couch. Plans were generated using intensity modulated beams in 28 patients. Circular, small volume targets in 5 patients were treated with dynamic conformal arcs. Isocentre and X-ray caliberation of Exac Trac system using X-ray calibration phantom with infrared markers was performed along with Winston Lutz test for Novalis Tx machine. For frame-based radiosurgery, beam's eye view projections were verified on treatment localizer box in eleven patients. For frameless radiosurgery, target position was verified using a pair of oblique X-rays fused with digitally reconstructed radiographs generated on Exac Trac system. The corrections in the couch positions were applied using 6-D robotic couch.

Results: Mean volumes of the targets were 4.39cc (range 0.29-18cc) in vestibular and trigeminal schwannomas; 14.95cc (range 4.4-31cc) in AVMs; 4.8cc (range 2.8-7.4cc) in meningiomas; 1.62cc (range 0.39-2.85cc) in pituitary adenomas; 0.56cc (range 0.2-1.5cc) in brain metastases and 42cc (range 14.5-83cc) in spine metastases. Mean volume of target in single fraction radiosurgery group was 3.93 cc (range 0.22-13.4cc). Mean dose for single fraction radiosurgery was 12Gy (range 12-13Gy for vestibular and trigeminal schwannomas; 18Gy (range 15-20Gy) for AVMs; 20Gy (range 18-23Gy) for brain metastases; 17.5Gy for pituitary adenomas, 14Gy for meningiomas. Large volume AVMs were treated with 28-35Gy divided in 4 or 5 daily fractions of 7Gy each. Vestibular schwannomas and meningiomas close to brainstem or optic chiasm were treated with 25 Gy divided in 5 fractions. Spine metastases were treated with 30Gy divided in 5 fractions.

Conclusions: Novalis Tx radiosurgery system can be used effectively for different cranial and spinal lesions. Fractionated radiosurgery treatment is feasible using Exac Trac 6-D robotic couch without compromising the target positioning accuracy.