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# Hybrid-arc fractionated radiosurgery of spine metastases

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## BACKGROUND:

Fractionated image-guided radiosurgery (fSRS) is an effective treatment of spine metastases. This treatment can be performed on Truebeam linear accelerator with dedicated equipment using isocentric modulated arc therapy (Hybrid Arc). Additional advantage of using dedicated system is the possibility of flexible fusion of CT and MRI images. Our aim was to present the results of hybrid-arc fSRS of spine metastases using dedicated system.

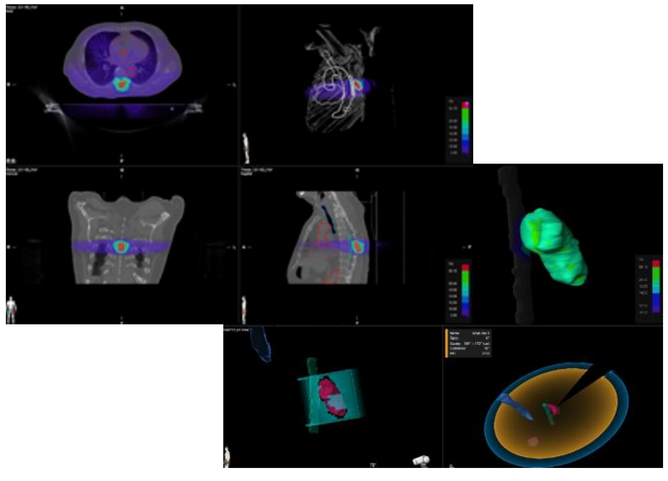


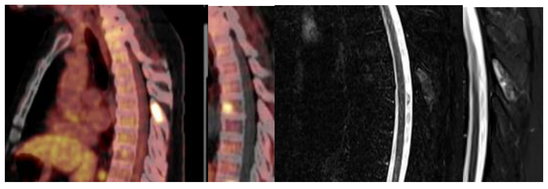
**Fig. 1** BrainLab Elements Spine Software dedicated for planning SRS of spine metastases

## MATERIALS AND METHODS:

The patient selection criteria were: age >18 years, diagnosis of spinal metastases (n ≤ 3), life expectancy >3 months, ESCC <3. Delineation was based on CT and MRI +/- PET elastic fusion, Exactrac™ system was used for treatment verification and Elements Spine Software Brainlab® Germany was used for dose planning (Fig. 1) . All radiation target volumes were defined based on MRI . If tumor was hard to define a PET images or margins of involved part of the vertebrae were used. Dose prescription of 21 Gy- 30 Gy in 3 fractions and 25-30Gy in 5 fractions. Local control was assessed using MRI or/and PET (Fig. 2) and pain control was based on patient assessment. Response was defined as partial or complete tumborderor regression in MRI. Five patients were controlled with PET. From 2019 to 2021, 47 spinal metastases in 34 recruited patients were treated with Hybrid-arc fSRS. Local control rates were defined in all patients at 3 months and in 20 patients (available data) at 6 months. Sixteen patients had at least one year of follow up. RT toxicity was assessed according to the Common Terminology Criteria for Adverse Events (CTCAE) v4.0.

## RESULTS:

In a median follow up of 10 months (range 3-32) response in MRI and PET was observed in 23% and 60% of treated lesions. The local control rates at 3- and 6- months were 96% and 95%, respectively. One-year overall survival rate was 85%. Pain decreased in 60%, was stable in 37% and not reported in 3% of cases. No adverse events ≥2 grade were observed.



a) b) c) d)

**Fig. 2** Completely answear in follow-up PET/CT a)09/2021 b)03/2022, stabilization in control MRI c)10/2021 d)04/2022

## CONCLUSIONS:

Our experience shows that hybrid-Arc spine fSRS provide very high local and pain control with low toxicity. Regression assessment in the spine using MRI is limited and may underdiagnose true response to treatment (Fig. 2) .