

TomoDirect: an efficient means to deliver radiation at static angles with tomotherapy

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ABSTRACT

Aims and background. The TomoTherapy Hi-Art II system is able to deliver dynamic intensity-modulated radiation therapy within a helical geometry providing robust conformality and modulation, abrupt dose falloff, and reliable accuracy. A new upgrade named TomoDirect was introduced recently, allowing delivery of radiation at discrete angles with a fixed gantry. We present our preliminary clinical experience with TomoDirect.

Methods. Three specific clinical contexts were chosen for the implementation of TomoDirect, namely palliation of bone metastasis pain (BP), whole brain radiation therapy for intracranial secondary lesions (WBRT), and adjuvant whole breast radiation therapy after conservative surgery for early stage breast cancer (AWBRT). After appropriate positioning, planning CT, contouring, and plan generation, all patients were treated with the TomoDirect upgrade of the TomoTherapy Hi-Art II system with different doses and fractionation according to clinical decision-making.

Results. Between May and December 2010, 41 patients were treated with TomoDirect. Eighteen patients were treated for BP (mainly vertebral metastases) with a predominant posterior field arrangement. Seven patients were treated for WBRT (multiple brain lesions) with a parallel-opposed latero-lateral approach and 16 patients were treated for conventionally fractionated AWBRT mainly with a 2-field tangential approach. Radiation treatments were generally well tolerated and the acute toxicity was mild.

Conclusions. While helical tomotherapy allows the delivery of very sophisticated treatment plans, in certain anatomical sites and clinical contexts where the number of beam directions is constrained and supposed not to affect plan quality, TomoDirect might be an efficient means to deliver radiation at static angles with consistent dosimetric and clinical results.

Key words: tomotherapy, TomoDirect, breast cancer, brain metastasis, bone metastasis.

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