AbstractID: 14197 Title: Intercomparison of breathing restriction techniques using commercially available immobilization devices for SBRT

Intercomparison of breathing restriction techniques using commercially available immobilization devices for SBRT

Purpose: This study is aimed at comparing the efficiency of two immobilization systems namely the Body Fix and the Body Pro-lok Systems and the various associated techniques used in minimizing tumor movement resulting in a smaller ITV. Minimizing tumor motion is essential for high precision in stereotactic body radiotherapy treatment (SBRT). The preliminary clinical results of SBRT using these two immobilization systems are discussed.

Methods

4 sample patients were staged in all for the two systems with data taken for Free breathing in the Body Fix and Body Pro-lok systems, Body Fix with Vacuum suction, Body Pro-lok with compression belt and compression plate. Respiratory movement was measured using a RPM respiratory gating system to track the respiratory amplitude displacement over a period of 60 seconds under each condition.

Results

By using the Body Fix and Body Pro-lok systems, respiratory motion were significantly reduced compared with the free-breathing condition in both systems. The difference in amplitude of the respiratory motion in Body Fix with Vaccum suction, Body Pro-lok with Compression belt and compression plate are significant reduced when compared with free breathing setup. The lowest restriction (higher respiratory amplitude reduction) was observed in the Body Pro-lok with compression plate with amplitude difference ranging from 2.5- 7.5mm while Body Fix with vacuum shows the least constrain (low respiratory amplitude reduction) with range from 4.0- 9.5mm and Body Pro-lok with compression belt in the range 3.0- 8.5mm.

Conclusion

Respiratory tumor movement was modestly suppressed by both the Body Fix and the Body Pro-lok System. Body Pro-lok with compression plate is considered the most effective for SBRT respiration immobilization and provided patient comfort within the treatment period. Preliminary results were encouraging and will be followed up with more sample patient.