

Purpose:

According as the previous scattering mode is being converted to a uniform scanning and a PBS, the methods of proton therapy are characterized by prolonged treatment time. Nevertheless, most of the gating or tracking methods correspond to patients' respiration. There are no considerations about the mobility of patients during the treatment. Given this background, the current study was conducted to confirm the movement of patients during the treatment and to adjust the position of patients using an automatic couch on a real-time basis.

Methods:

A cruciate form of tattoo was drawn on the body of patients and it was photographed using CCD. With the use of image pattern matching method of NI Vision assistant, the current location was confirmed. A real-time image of tattoo was done to confirm the set-up position of patients. In regard to the movement of patients within a tolerance range, a couch was moved and the location was adjusted accordingly. In cases in which the movement was measured to a higher level than the tolerance range, to prevent the fluctuation of patients' body due to the abrupt movement of table for the position correction, a beam-off was attempted and the set-up of patients was adjusted accordingly. Following the adjustment of patients' location, with the use of methods where a beam-on gating and a tracking were synchronously performed, the location of patients was adjusted.

Results:

To develop and then to investigation the program algorithm for automatic couch correction and tracking, a small-sized 3D phantom was prepared. Following the preliminary experiment, a correction of couch position was effectively achieved according to the movement of target.

Conclusion:

From now on, further practical studies are warranted to make an application of moving couch apply to a clinical use.