

Purpose

In brachytherapy, film-based planning commonly used for distinguishing the sources accurately whereas transverse imaging modality like CT used for obtaining the organ structure and dose-volume histogram (DVH) directly. In this study, to obtain both advantages of projected x-ray film and CT image, we performed a registration of the coordinates of the film and CT.

Method and Materials

The 3D reconstruction algorithm for x-ray film was based on the semi-orthogonal method and the registration software developed in IDL 5.5. To verify the registration algorithm, we applied to the humanoid acrylic phantom. The external fiducial marker and the targets, the visible in both films and CT image, attached to the phantom then images acquired. The registration tool provides the coordinates transformation of the pair of orthogonal films and CT image sets.

Results

The differences in the coordinates of the targets using registration software showed the within 1.5 mm from all directions in the CT scans. (3 mm slice thickness) As film coordinates of the x and y-axis derived from the z-axis of the CT relative to a slice thickness, the uncertainties of x and y was greater than z-axis.

Conclusions

This method provides the exact positions of the sources and organ positions from registration software. Therefore, it can be a useful and reliable method for treatment planning in brachytherapy planning.