Robot-assisted Navigation System for CT-guided Percutaneous Lung Tumor Procedures: Our Initial Experience in Hong Kong

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ABSTRACT (Word Count: 250)

PURPOSE:

To evaluate the new Robot-assisted Navigation System for CT-guided lung tumor procedures

MATERIALS AND METHODS:

Imaging-guided lung procedures are usually challenging due to patient breathing. This is ongoing prospective study with 50 patients targeted in a university-based hospital. This was initial assessment of efficacy involving 10 patients with lung tumors underwent CT-guided lung interventions utilizing the Robot-assisted Navigation system (Maxio, Perfint Healthcare, USA). Targeted needle pathway was planned on Maxio Robotic system based on pre-procedural CT-scans. Primary endpoint was satisfactory instrument position for intended intervention. Lesion size and depth from skin were noted. Performance level was documented on five-point scale (5-1: excellent-poor). Total radiation doses were recorded and compared against 20 patients with conventional CT-guidance and CT-fluoroscopy lung procedures (ratio 1:1).

RESULTS:

There were 7 males and 3 females patients in Robotic group. Average age was 72.1 years (range 67-78). 8 patients underwent lung biopsy while rest had thermal ablation or fiducial marker insertion. Average lesion size was 2.8cm (range 1.9-4.1cm). Average lesion depth was 6.2cm (range 3.7-8.6cm). All interventions met primary endpoint of satisfactory instrument positioning. Average performance levels were 4.5. Average radiation dose (Dose Linear Product) was 480.4 (range 196.5-959.8) whereas conventional CT-guidance was 645.4 (range 285.1-1043.5) and CT-fluoroscopy was 460.1 (range 214.2-1157.0).

CONCLUSIONS:

Our initial experience demonstrated effectiveness of Robot-assisted Navigation system for CT-guided lung tumor interventions with lower radiation dose compared with conventional CT-guided procedures. Radiation doses were similar to CT-fluoroscopy without radiation exposure to interventional radiologists. Targeting success rate for satisfactory intervention was 100%.