

CT-guided fiducial marker placement for Stereotactic Ablative Radiotherapy in lung malignancy: safety and efficacy based on a single-centre experience

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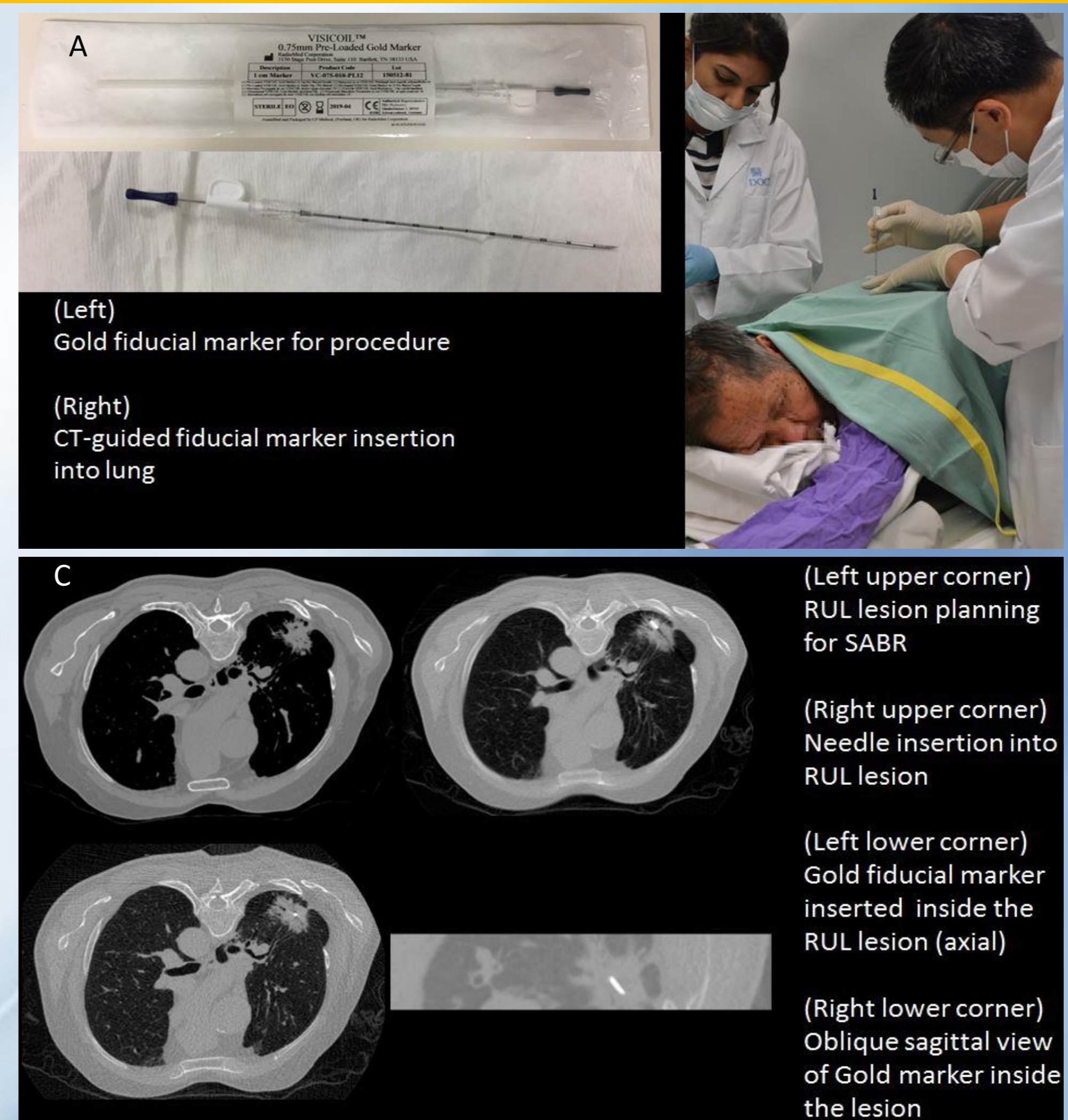
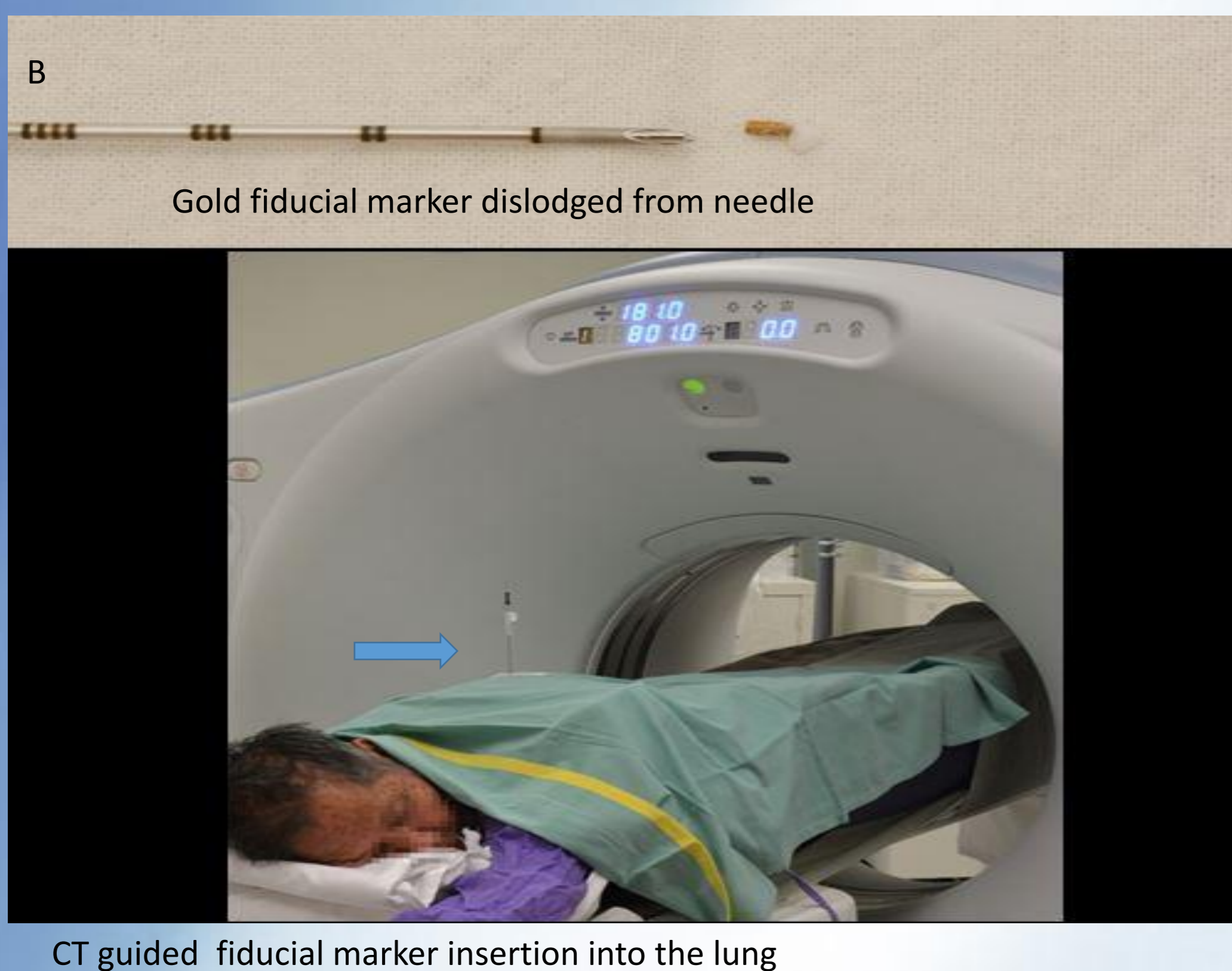
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Purpose

- Stereotactic Ablative Radiotherapy (SABR) allows precise radiation dose to tumor while sparing adjacent important normal organs. The movement of intra-thoracic organs due to breathing had limited to SABR usage. The fiducial markers insertion close to the lung tumors facilitates tumor-tracking SABR to improve accuracy of pulmonary tumor localization.
- We aimed to describe our experience with gold lung fiducial marker and evaluate the technique, efficacy and safety of imaging guided lung fiducial marker placement at our institution.

Material and Methods

- Retrospective review of patients underwent imaging guided lung gold fiducial marker (IZI medical) placement (2009–2014).
- All cases performed under local anesthesia.



Results

- 26 patients (M:F=18:8) with mean-age 71.4years (range 42–86) underwent lung fiducial marker placement.
- 26 patients underwent MDCT guidance. One patient had two separate sessions for two different lesions.
- All post-procedure MDCT (27) confirmed marker-positioning.
- Technical success rate (successful fiducial marker placement) was 27/27 (100%).
- 26 cases consisted of 10 adenocarcinoma (38.5%), 10 Squamous cell carcinoma (38.5%), 1 poorly differentiated NSCLC (3.8%) and the rest (5) are pulmonary metastases from: 3 colonic tumor (11.5%), 1 nasopharyngeal carcinoma (3.8%) and 1 sacral chordoma (3.8%).
- Average size of target tumor was 2.62cm (range 0.9-7.8cm).
- The target tumor site in RUL/RML/RLL/LUL/LLL was 14/1/5/3/4 respectively.
- In 6 patients, one marker was deployed close to target lung tumor. 19 patients had 2 markers due to multiple target lesions while 1 patient had 3 markers inserted for multiple large target lesions.
- 25 patients received subsequent SABR. One patient had two SABR for two different lesions. One patient was excluded from subsequent SABR as reduction in size of tumor in planning CT. Clinical success rate (defined as completion of SABR) was 26/27 (96.3%).
- No pneumothorax (12) or trace pneumothorax (9) were in total 21 cases that were not required chest tube (77.8%). Small to moderate pneumothorax required chest tube in 6 cases (22.2%).
- Average hospital stay was 1.7days (range 1-4).

Conclusion

- CT guided lung fiducial marker placement is safe and effective procedure which can facilitate accurate lung localization for SABR in treatment of lung cancer.