Purpose/Objective: Implantation and tracking of gold markers is a direct method of tumor visualization during radiotherapy (4D-RT). Fifty years experience of fine-needle aspirations for cytology specimens using spinal-type narrow needles almost anywhere in the body with minimal risk of bleeding or infections were the basis for our development of this new gold marker instrument.

Materials/Methods: This the fine-needle cannula GA1 20 mm in length (Gauge 25, 0.53 mm in diameter) and GA200 mm in length (Gauge 22, 0.71 mm in diameter) contains a 20 mm long gold wire (0.28 mm in diameter) that can be implanted at almost any site in the body. Small scoring cuts or notches in the gold wire every 2.0 mm force the wire to fold to a dense marker as it enters the tumor tissue where it automatically anchors itself, making further delocalization impossible (Gold Anchor™).

Results: Patients with various malignancies referred for radiotherapy have received the marker implant in different body regions (lungs, liver, breast, cervix, prostate, pancreas and other sites in the abdomen) using ultrasound or CT-guidance without local anesthesitics. The shape of the marker can be adjusted into a single clump, a clump with a string or a string alone. Once implanted, the marker is clearly visible with kilo-voltage imaging. A similar spinal needle (G25 / 0.53 mm) is also used for cytology. 395 consecutive patients with lung tumors were diagnosed with fine needle aspiration cytology (FNAC) at the Department of Diagnostic Radiology, Karolinska University Hospital, between 2006-2009. Nine patients needed an intervention (2.3 %). Seven patients with thoracic drainage (4 Bülau drainage and 3 True-close ). In 2 patients a small amount of air was exsufflated with a thin needle. Another two patients got hemoptysis of short duration.

Conclusions: Increasingly, we must be certain of exact localization of tumor targets by using markers and IGRT. The fine-needle marker presented here allows implantation into almost any tumor site with minimal risks of internal bleeding, infection or pneumothorax and can be implanted safely and precisely using ultrasound or CT. The Gold Anchor™ is developed for visualization with kilo-voltage equipment during radiotherapy.

Conflict of Interest: Research sponsored by Naslund Medical, www.FineNeedleMarker.com

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Int.Pat.Pend.

Regular gold marker needle dimension: 17 G needle, diameter of 1.47 mm

Gold Anchor™ fine needles: 22 G needle, diameter of 0.71 mm 25 G needle, diameter of 0.53 mm

only 2.3% thoracic drainage

no need for treatment thoracic drainage air exsufflated