



EUS-guided fiducial placement for intramural GI neoplasia: a facilitated technique

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Image-guided radiotherapy has emerged as a fundamental technique in the multimodality treatment of esophageal cancers, either as brachytherapy or stereotactic body radiotherapy.¹ The technique of choice to outline the target for image-guided radiotherapy is the deployment of inert gold markers (Fig. 1). Gold markers (fiducials) allow precise delineation of the target lesion, thus permitting accurate high-dose radiation delivery.²

EUS plays a pivotal role in the locoregional staging of esophageal tumors. It allows precise evaluation of the depth of invasion within the esophageal wall layers and the pathologic locoregional lymph nodes. Moreover, EUS has become the preferred technique for fiducial marker placement because of its minimal invasiveness compared with a percutaneous or intraoperative approach. EUS-guided fiducial deployment was first and more extensively described for pancreatic cancer.³ However, fiducial delivery for esophageal and rectal lesions has recently gained popularity.

We report the case of a 54-year-old man with a poorly differentiated esophageal squamous cell carcinoma. He was referred to our unit to undergo EUS-guided fiducial deployment before brachytherapy. Curative surgery and chemotherapy were contraindicated because of concomitant liver cirrhosis.

Upper GI endoscopy showed a 20-mm ulcerated lesion in the middle third of the esophagus and medium-sized esophageal varices in the lower third. Subsequent EUS study highlighted a 20- × 8.7-mm hypoechoic inhomogeneous

lesion with irregular margins limited to the muscular layer, with 1 pathologic locoregional lymph node (uT2N1) (Fig. 2). EUS-guided submucosal injection of 5 mL of glycerol (10%) was performed, 15 mm proximal to the center of the lesion. Two gold fiducials were deployed within the submucosal bleb using a 22-gauge preloaded fiducial needle (Cook Medical, Bloomington, Ind, USA) (Fig. 3). Subsequent fluoroscopic control confirmed technical success and good visibility of the fiducials (Fig. 4) (Video 1, available online at www.VideoGIE.org). Radiotherapy was performed without any adverse events, and the fiducials remained in place for the treatment period with no need of redeployment.

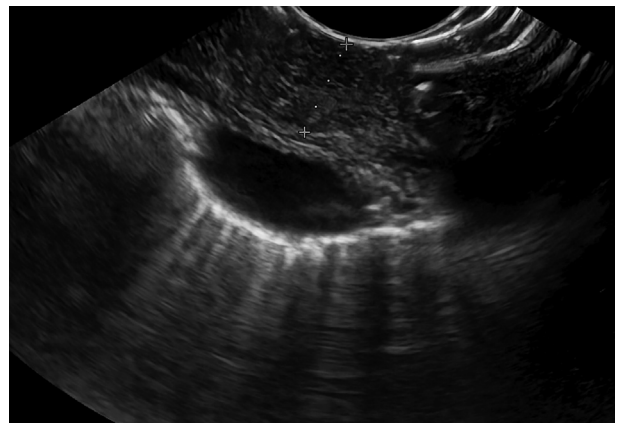


Figure 2. Endosonography evaluation of the esophageal neoplastic lesion.

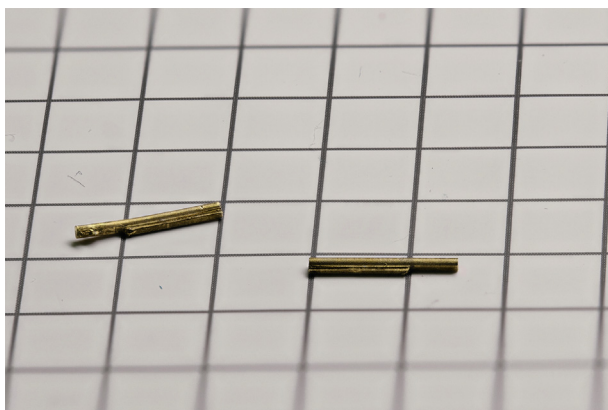


Figure 1. Inert gold fiducials (5 mm).

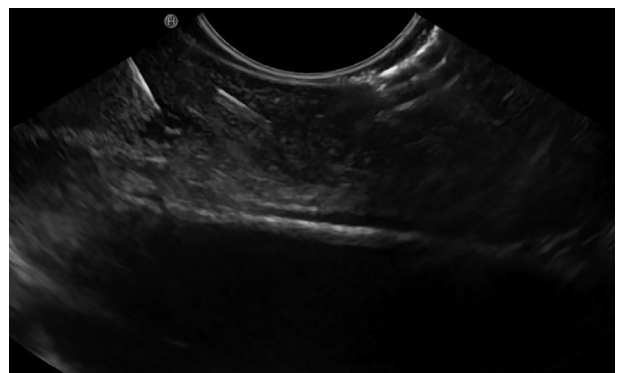


Figure 3. Endosonography highlighting correct placement of 2 fiducials within the submucosal layer.



Figure 4. Fluoroscopy confirming good visibility of the fiducials after EUS deployment.

Fiducials are radiopaque inert markers (spheres, flexible coils, or rigid seeds), typically made of gold. They are placed near tumoral lesions to allow precise localization and targeting. Fiducials are 5 mm in length and 0.43 mm in width. The 22-gauge needle used for the described procedure is a new needle, more flexible than the 19-gauge one; it allows consecutive deployment of markers without need of reloading after its insertion. A submucosal cushion was created by using glycerol to both facilitate fiducial placement within the submucosal layer and reduce the risk of long-term migration. The creation of a submucosal cushion before EUS-guided fiducial deployment is an effective technique to ensure safe and correct insertion within the submucosal layer. Therefore, it reduces the risk of fiducial misplacement and migration.⁴

Adverse event (mild mediastinitis, pneumothorax) and migration rates range from 0% to 13% and 0% to 8%, respectively.^{5,6} Aforementioned adverse events are more

frequent in early and intramural luminal cancers because of limited wall thickness and higher risk of superficial fiducial insertion. Moreover, intratumoral insertion should be avoided to reduce the risk of adverse events and migration during radiotherapy owing to tumor response.

DISCLOSURE

All authors disclosed no financial relationships.

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