AbstractID: 5264 Title: Placement of Localization Wires for Breast Surgery Guided by the Positron Emission Mammography

Objectives: Positron Emission Mammography (PEM) with F18-FDG has been shown to be useful in breast cancer diagnosis and characterization [1]. The ability of PEM to determine breast cancer extent makes it potentially useful for planning surgical excisions. Breast surgery is commonly directed with the use of the hook wires placed under radiological guidance. We sought to develop a method to perform PEM-guided wire localization procedures with image confirmation, which could be used for directing breast conserving surgery.

Materials and Methods: Five-millimeter lesions with physiologic concentration (0.1uCi/cc) of F18-FDG were implanted into a breast tissue phantom at various locations. Ten-minute PEM scans were performed, and the lesions were located in three dimensions using the PEM tomographic images. 15cm long, 24Ga hollow hook wires filled with a small amount of the F18-FDG (0.1uCi/cm) were guided toward the lesions based on the PEM spatial coordinates. Post-placement scans were acquired to confirm correct placement of the wires relative to the lesion. Placement-accuracy was determined by dissecting the phantom along the wire, and verifying the lesion position relative to the localization wire hook.

Results: All ten attempts at lesion localization were successful.

Conclusions: An accurate and practical method of wire localization of breast lesions identified on PEM images was developed and tested on phantoms.

References

1. Tafra L et al. Pilot Clinical Trial of 18F-fluorodeoxyglucose Positron-Emission Mammography in the Surgical Management of Breast Cancer. *Am J Surg*. 2005; 190:628-32.

Disclosure

Authors are employees of the company sponsoring the study.