Titanium Clip Metal Detector to Aid Breast Surgery (2016-053)

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Technology description

This handheld metal detector aids surgeons with localizing breast cancers, eliminating the need for invasive procedures. With the increased use of mammographic screening, breast cancer is more frequently detected as a radiographic lesion only rather than a palpable mass. This has made image-directed localization a necessity for surgical excision in a significant proportion of cases. When a patient has an abnormal mammogram, a radiologic breast biopsy is performed and a titanium clip is placed at the biopsy site to mark the site of the cancer. When a patient has a surgical localization procedure, a wire, radioactive seed, or reflective devise are all placed adjacent to the site of the titanium clip to guide the removal of the cancer with the clip. MUSC Health and Clemson University researchers have developed a method to directly detect the titanium clip without an invasive procedure to localize the lesion. This approach eliminates the need for invasive procedures and will save time for the patient, reduce pain, eliminate fees associated with the localization procedure, and improve operating room utilization.

Technical Summary

This titanium metal detector localizes titanium biopsy clips placed at the site of breast tissue biopsies. The device is a handheld metal detector that can be inserted into a surgical incision to help locate small titanium markers without an invasive procedure to insert a localizing wire or radioactive seed. The device uses a two-step detection system which is initiated by running the scanning wand across the patient’s breast as a means of rapidly guiding clinicians to the marker’s general location. Once an approximate location is determined, the probing wand is used to identify the marker’s precise location. An incision is made and the probing wand guides the surgeon’s path to the marker through continuous feedback. The system relates proximity information to clinicians both through auditory feedback mechanisms and a digital display on the base.

Application area

Breast cancer localization Proof-of-concept

Advantages

• Eliminates invasive procedures to localize clip, increasing patient comfort

• Facilitates operating room scheduling and workflow, reducing wait time and fees for patients

Institution

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