

AbstractID: 9436 Title: Characterization of true and false positive locations of spiculated lesions on mammography

Purpose:

We are developing a model-based framework for the detection of spiculated masses on mammography, the current performance of which is 88% sensitivity with 2.7 false positives per image. The goal of this study is to identify features that uniquely characterize the true positive (TP) and false positive (FP) detections from this system.

Method and Materials:

A two alternative-forced-choice observer experiment was used. For each of the 47 cases of spiculated masses, the true lesion location and the highest-ranked FP from the CAD were shown to the observer (radiologist). The observer was not told if he/she was looking at the true lesion location or FP and the order in which these were shown was random. The radiologist visually inspected these images to pick the one that corresponds to the true lesion location. We then compared this decision to the ground truth to analyze the TP and FP detections that were incorrectly determined by the radiologist.

Results:

The radiologist correctly identified the true lesion location and false positive for all 47 cases. These data suggest that the radiologist could easily dismiss the false positives marked by the CAD algorithm.

Conclusion:

While false positive detections remain a challenge with the current version of our model-based framework for the detection of spiculated masses on mammography, this study implies that those false positives may be recognizable as such by the radiologists and suggests future directions for reducing the number of false positive marks.