The evaluation of the disease extent in patient with Ductal Carcinoma In Situ: Comparison of Mammography, Sonography, and MRI

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PURPOSE

The purpose of this study is to determine relative accuracy of mammography (MMG), ultrasonography (US), and magnetic resonance imaging (MRI) in patients with ductal carcinoma in situ (DCIS) as compared with pathology finding.

METHOD AND MATERIALS

Institutional review board approval was obtained with waiver of informed consent. Between January 2001 and December 2008, 91 women with 97 lesions of DCIS or microinvasive ductal carcinoma underwent MMG, US, and MRI preoperatively. The size of lesions was measured by each radiologist on each imaging modality and these finding was compared with pathologic result. We arbitrarily decided to use the same percentage-30% of the longest diameter-as described by the World Health Organization for comparison with physical examination. The imaging size was defined as an equal if it was within the range from 70% to 130% of the pathology size, an underestimate if it was less than 70% of the size at pathology and an overestimate if it was greater than 130% of the size at pathology. Agreement-disagreement rates for sizes at MMG, US, and MRI were compared with size at pathology using intraclass correlation coefficient (ICC). The tendencies of all methods to under- or over-estimate the size were tested using the Wilcoxon's signed rank test.

RESULTS

The mean lesion diameter was 2.9 mm (range, 0.2~11 mm). Microcalcifications were seen in 61 of 97 lesions (62.9 %) on MMG. MRI enabled identification of DCIS in 96 (99.0 %) of the 97 lesions. US detected DCIS in 93 (95.9 %) of the 97 lesions and MMG detected DCIS in 84 (86.6 %) of the 97 lesions. MRI showed best reliability with pathologic finding (ICC=0.904, p=0.000) than US (ICC=0.746, p=0.000) and MMG (p=0.564, p=0.000). Agreement about the extent of DCIS as measured by MRI, US, and MMG compared with pathology was 65.0 %, 60.8 %, and 41.2 %, respectively. MRI complied with pathologic finding more often. When there was disagreement between imaging and pathologic size, MRI had the significant tendency to overestimate the size of DCIS (p=0.000). MMG showed better reliability with pathologic finding in cases of DCIS with calcification (ICC=0.612, p=0.000) then without calcification (ICC=0.540, p=0.001). USG showed better reliability with pathologic finding in cases of DCIS without calcification (ICC=0.846, p=0.000) then with calcification (ICC=0.696, p=0.000). MRI showed relatively high reliability with pathology regardless of presence of calcification (ICC=0.921, ICC=0.897, p=0.000).

CONCLUSION

MRI appears to provide the better correlation with pathology than MMG and US in patients with DICS. However, MRI had the tendency to overestimate the extent of DCIS than US and MMG.