Value of Star Map for assessing cystic ovarian tumors
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PURPOSE
“Star Map” can produce T2*-value map that yield excellent susceptibility-weighted contrast. The purpose of our study was to evaluate the utility of Star Map for diagnose of cystic ovarian tumors.

MATERIALS AND METHODS
25 patients with pathologically proven ovarian tumors were included in this study (age 16–72 years, mean 44.4 ± 16.5 years). The tumor types were as follows: endometrial cyst (n=12), cystic teratoma (n=3), and serous or mucinous cyst adenoma or carcinoma (n=10). All patients underwent pelvic MR imaging at a 3.0T (Discovery 750w GE healthcare) including Star Map; Star Map was performed in axial planes using a 7 mm slice scanned at 8 different echo times (TE=1.8/3.7/5.7/7.6/9.6/11.5/13.4/15.4 ms). Each image was acquired using a gradient-echo sequence: FOV 40×36, TR/FA=175/12, flip angle 25°, matrix 256 X 224, sampling bandwidth 83.3 kHz, Gap 2, NEX 1. The regions of interest (ROIs) were manually drawn as big as it could be on Star map in areas corresponding to the non-enhancing area. This was done avoiding the artifacts within the ROIs. The areas showed high signal intensity on T1WI of ovarian tumors also evaluated. For each ROI, the mean T2* values, the mean R2* values, were documented. We attempted to categorize the R2* decay curves into three patterns (straight, logarithmic, and pectinate).

RESULTS
The mean T2* values and R2* values were 81.7±71.2 ms and 28.6±24.9 Hz for endometrial cysts, 20.5±4.6 ms and 50.1±11.2 Hz for cystic teratomas, and 170.7±49.5 ms and 6.4±2.4 Hz for serous or mucinous cyst adenomas/carcinomas, respectively. Both T2* values and R2* values were significantly different among endometrial cysts, cystic teratomas and cyst adenomas/carcinomas (p<0.05). The R2* decay curve was categorized as the logarithmic pattern for endometrial cysts (Fig a), as the pectinate pattern for cystic teratomas, and as the straight pattern for serous or mucinous cyst adenomas/carcinomas (Fig b).

DISCUSSION
“Star Map” is a technique that acquires multiple echoes at different TE times at each location resulting in images that represent variations of T2* weighting. Post-processing of the images is employed to generate gray scale and color maps of the T2* signal decay across the echoes, which can be useful in the assessment of the presence of iron. We have found that Star Map is useful for differential diagnosis of cystic ovarian tumors. Since there were some overlaps of T2* and R2* values among them in spite of the significant differences, however, the decay patterns of the R2* curves seems to add more information for the diagnosis of cystic ovarian lesions.

CONCLUSION
Our results suggest that Star Map is a helpful tool for diagnosis of cystic ovarian tumors.

Figures. Two representative cases with endometriosis (Fig. a) and serous cyst adenoma (Fig b). For endometriosis, T2* and R2* values are 19.2ms and 52.1Hz, respectively, and R2* decay shows logarithmic pattern. For serous cyst adenoma, T2* and R2* values are 166ms and 6Hz, respectively, and R2* decay shows straight pattern.