

Cervical carcinoma on high-resolution MRI: Implication for fertility-preserving surgery

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Introduction: Recently, fertility-preserving surgery in the treatment of early stages of cervical cancer has been in great demand, because the number of cervical cancer in young patients has been increasing and the average age of women having their first child has been older. To evaluate extension of the tumor proximal to the internal os is crucial for examining whether there is adaptation of fertility-preserving surgery, especially radical trachelectomy, or not. There have been few reports assessing the tumor extent at MR imaging, although the usefulness of MR imaging for evaluation of the stage of cervical cancer has been widely recognized in previous studies (1-3). In this study, we focused on the tumor extent using high-resolution MR imaging and compared T2-weighted image and post-contrast T1-weighted image with macroscopic section, allowing us to determine which image can demonstrate the tumor extent correctly.

Materials and Methods: Forty patients with cervical cancer underwent MR imaging with use of a 1.5T Signa Excite system (General Electric Medical Systems, Milwaukee, WI) using an 8 channel body coil. Pulse sequences performed were axial, oblique sagittal and oblique coronal T2-weighted sequences and post-contrast T1-weighted sequences with fat saturation (FS). Oblique planes selected by the radiologist were based on the cervical canal. The matrix was 256 x 192 (zip 512), with a 16 or 18-cm field of view, giving an in-plane resolution of between 0.31 x 0.31 mm and 0.35 x 0.35 mm, with 5 mm slice thickness. MR images were obtained after opacification of the vagina with the jelly for ultrasound. The MR images were analyzed by two radiologists about tumor extent and margins. We evaluated T2-weighted sequences and post-contrast T1-weighted sequences with FS in terms of margins of the tumor, using five-point scale: 5, very distinct; 4, distinct; 3, slightly indistinct; 2, indistinct; 1, obscured. Also findings at each sequence were compared with macroscopic sections.

Results: Margins of the tumor on post-contrast T1-weighted sequences with FS were more distinct than that on T2-weighted sequences. Mean score of the former was 4.5, that of the latter was 3.3, which were statistically different. In nine cases, there were differences more than 5 mm about tumor extent between post-contrast T1-weighted sequences with FS and T2-weighted sequences. Post-contrast T1-weighted sequences with FS reflected macroscopic tumor extent more precisely than T2-weighted sequences (Fig. 1).

Conclusion: Post-contrast T1-weighted sequences with FS are more efficient about tumor extent than T2-weighted sequences, so post-contrast T1-weighted sequences with FS are mandatory for fertility-preserving surgery.

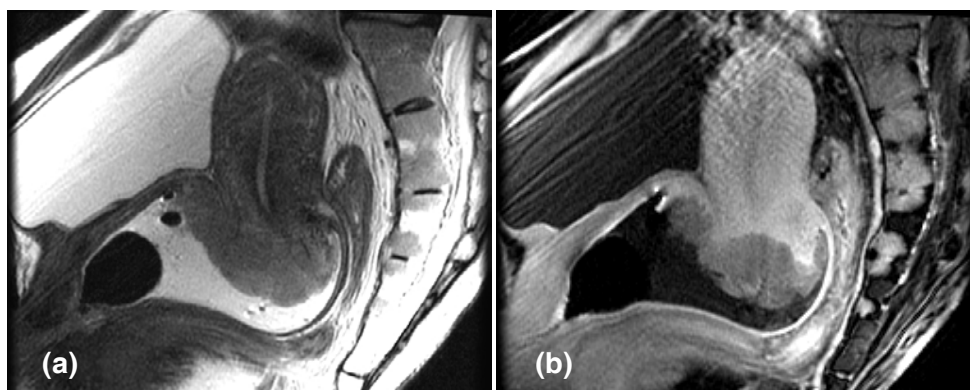


Figure 1: (a) T2-weighted image. (b) Post-contrast T1-weighted image with FS.

Post-contrast T1-weighted imaging is superior to T2-weighted imaging in demonstrating the tumor extent and margin.

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