

ROLE OF MR EXAMINATION IN THE EVALUATION OF ENDOMETRIAL AND CERVICAL CANCER

PhD thesis abstract

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The determination and classification of gynaecological tumour stage are based on clinical, pathological examinations. By the development of imaging techniques, the methods revealing the tumours became more precise. The intra-organ tumour propagation is best visualized by MRI which has an excellent tissue resolution therefore it has a priority against the CT at early tumour stage. In endometrial carcinoma, the depth of myometrial invasion is the most important prognostic factor, which could be well predicted by MRI. The tumour size and the early parametrial and vaginal propagation could be determined by MRI as well. The revised, new FIGO classification system, which is available since 01.01.2010 suggest the MR examination for the first time in the case of cervical carcinoma to define the primary tumour stage parallel with clinical examination. The international studies emphasize that the published good results could be achieved if and only if measurements are executed besides strict technical requirements applying standard protocol and appropriate device and the examinations are assessed by experienced experts. In 2010, based on the results of multicentric surveys, the ESUR accepted standardized examination protocols in the follow-up examinations of the pre- and post-treatment status determination of cervical carcinoma.

The imaging examinations have significant role not only in determining the primary status, but in measuring the therapeutic response, in revealing residuum/recurrence and in defining therapeutic complications as well.

Patient groups:

In the CT-MRI laboratory of the National Institute of Oncology, in the period between 01.01.2006 and 31.12.2011, 378 patients with uterine cancer underwent on minor pelvic MRI examination. Finally 89 patients were chosen out of the 378 patients, who had surgery after the MRI examination, so only their imaging results were compared to the pathological findings. One of the most important prognostic factors, the demonstrability of the depth of myometrial invasion was determined separately at all patients. The demonstrability of the myometrial invasion of the tumour was separately evaluated on both the T2-weighted and on the contrast-enhanced series as well. The benign lesions of the uterus (e.g. myoma, adenomyosis, endometritis) were also took into consideration.

During the above mentioned time period (01.01.2006-31.12.2011), at 345 patients suffering from cervical carcinoma, minor pelvic MR examination was executed, and in 180 cases abdominal and minor pelvic CT scans were done. A such patient group was selected, in which the minor pelvic MR examination was immediately followed by surgery, so the preoperative MR examination of 50 patients with cervical carcinoma were finally reviewed.

The imaging modalities have a major role not only in stage determination before the therapy, but in the evaluation of the post-therapeutic response and detecting residuum or recidivas as well. A patient group was selected in which the post-therapeutic changes were assessed. Between 2005 and 2011 356 CT/MRI examinations of 100 patients suffering from cervical carcinoma were reviewed. 28 patients out of 100 had surgery, whereas 72 patients had irradiation or radio-chemotherapy. The structure, the signal intensity and the contrast agent accumulation of the cervix, the vaginal stump, the lymph nodes, the organs of the minor pelvis and the bones were evaluated.

Objectives:

My aim was to determine the role of MRI in the oncological diagnostical and therapeutical algorithms, in endometrial and cervical cancers.

I was studying the information values of MRI:

- Statistical indicators of MRI in the operative cases of cervical and endometrial cancers, compared with the pathological diagnosis
- Which MRI measurement gives us the best information about myometrial tumour invasion in endometrial cancer
- MRI signs of the post-treatment changes
 - post-therapeutic complications,
 - for differentiating residual/ recurrent tumours from posttherapeutic masses

I wanted to elaborate standard MRI protocol for endometrial as well as cervical cancers.

Practical benefits of the study and new results:

- An accurate evaluation was given in the stage of endometrial cancer determined with MRI.
- The statistical value of preoperative MRI was determined concerning depth of myometrial invasion: Sv:71%, Sp: 92%, PPV:86%, NPV: 83%, Acc: 84%.
- It was observed that both T2-w and CE-T1FS MRI are essential in the detection of myometrial invasion.
- The two measurements together give the best results. The tumour was well determinable in T2-w: 77%, CE-T1FS: 70%, T2-w + CE-T1FS: 91%.
- It was found that myoma and adenomyosis were pitfalls in the falsely determined cases of endometrial carcinoma.
- The accuracy of preoperative MRI in cervical cancer was determined. Overall Acc: 80%, locoregional LN status Acc: 70%.
- The highest accuracy (98%) was in early stage (I/A-I/B1).
- The MRI signs of postoperative and postirradiation changes were determined, which are possible pitfalls in the differentiation of residual and recurrent disease after treatment.
- An effective MRI protocol was elaborated for endometrial and cervical cancer that was well comparable with international literature.
- An imaging database was created in Hungary for further education.