

COMMENTARY

# Survival impact of the degree of parametrial invasion on MRI in locally advanced cervical cancer



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## The role of MRI for the evaluation of parametrial invasion

For cervical cancer, the presence or absence of parametrial invasion (PMI) is an important prognostic factor. It is related directly with the International Federation of Gynecology and Obstetrics (FIGO) staging system ( $\geq$  or  $<$  stage IIB) and treatment decisions. Historically, FIGO staging of cervical cancer has been the clinical staging system with PMI evaluated based on physical pelvic examination findings until 2018. The revised FIGO 2018 has allowed the incorporation of cross-sectional imaging and/or pathological findings, moving to a surgicopathologic staging system [1]. One other key update of FIGO 2018 is the addition of lymph node metastasis (LNM) as stage IIIC (IIIC1 for pelvic LNM, and IIIC2 for paraaortic LNM), considering their prognostic impacts.

The parametrium is the supporting connective tissue surrounding the cervix, contains ureters, internal iliac vessel branches, lymphatic vessels, and branches of inferior hypogastric plexus. It is clinically important as the main route of direct local extension and lymphatic spread to reach the pelvic lymph nodes. Since chemoradiation

therapy (CRT) became the standard treatment for locally advanced cervical cancer (LACC) [2], the presence or absence of PMI has become associated directly with decision-making for surgical indications. Magnetic resonance imaging (MRI) has been regarded as the most accurate modality to evaluate PMI [3]. When PMI is suspected in the initial evaluation, surgical treatment alone is not regarded as sufficiently curative treatment. Other treatment options include neoadjuvant chemotherapy followed by radical hysterectomy [2]. Under current circumstances, clinical–radiological–pathological correlations of PMI with no treatment modification are very difficult. Precise evaluations based on MRI are expected to play increasingly important roles in pretreatment evaluation and prognostic prediction.

## What is new?

Clinical research of diagnostic imaging in cervical cancer has specifically focused on the presence or absence of PMI, rather than the degree of PMI. Russo L et al reported the prognostic value of the degree of PMI on MRI for patients with LACC on whom neoadjuvant CRT had been performed followed by radical hysterectomy and pelvic (and paraaortic) lymphadenectomy [4]. They used conventional evaluation methods: measurement of the maximal length of lateral PMI ( $PMI_{max}$ , in millimeters) and the ratio of the lateral PMI ( $PMI_{ratio}$ ,  $100 \times PMI_{max} / \text{total length of parametrium}$ , in percent). The modest prognostic effects of these two parameters were reported for patients who did not have pathologically proven LNM: hazard ratio (a 95% confidence interval), 1.09 (1.01–1.17) for  $PMI_{max}$  and 1.04 (1.00–1.08) for  $PMI_{ratio}$ . Considering the role of the parametrium as the main route of tumor

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spreading, their results can be regarded as very reasonable, substantiating what gynecologic oncologists have clinically experienced. The benefits of their study might include its easy implementation in clinical settings, although further validations of repeatability and reproducibility are needed. Their results indicating that the degree of PMI had no significant differences in patients with pathologically proven LNM also provide important information in accordance with the revised FIGO 2018. In fact, LNM might confound the degree of PMI, considering the role of PMI as the route of lymphatic spread.

### Revisit of classical MRI findings

The utility of MRI for evaluating the presence or absence of PMI has been well established [3]. In the last few decades, MRI techniques have advanced rapidly, with shorter acquisition times, and with more robust techniques for motion artifacts, diffusion-weighted images, and so on. Revisiting the morphological evaluation of local extension of cervical cancer using advanced MRI techniques, qualitatively or quantitatively, might engender the creation of new values of MRI, i.e., the clinical impact of anterior/posterior PMI, the relation between the degree of PMI and LNM difficult to detect based on imaging size criteria, etc. Insights gained from revisitation might accelerate the development of precision medicine for cervical cancer.

### Conclusion

The study reported by Russo L et al provides new prognostic tools for patients with LACC without pathologically proven LNM [4]. Precise evaluations of local tumor extension on MRI are expected to be increasingly important under current circumstances, where the indications of CRT are expanding. Consequently, radiologists can increasingly provide clinically relevant information to gynecologic oncologists, based on evaluations made using MRI.

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#### Methodology

• commentary

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