

Correspondence

Modalities for evaluation of tumor size in cervical cancer

To the editor: We read with interest the recent report from Lee et al. regarding the value of pelvic examination and imaging modality for the evaluation of tumor size in cervical cancer.¹ Using pathologic results as standard reference, the authors compared the accuracy of pelvic examination with that of imaging modalities (CT or MRI) for tumor size measurement. Because the correlation coefficient between pelvic examination and pathologic results was higher than that between imaging modalities and pathologic results, the authors concluded that pelvic examination is superior to imaging modalities for tumor size measurement. However, we have several concerns with respect to the study.

First, as shown in Figure 1(B), tumor was not detected by imaging modalities in 21 patients; even an 8 cm-sized tumor was not detected by imaging modalities. We presumed that the undetected tumors of those patients could partially account for poor correlation between imaging modalities and pathologic results. Considering that CT is inferior to MRI in tumor visualization,² we think that most of 21 patients might undergo CT alone. Therefore, the causes of insensitive imaging modalities should be addressed. If the insensitivity were due to CT, the result of subgroup analysis that included only patients who underwent MRI has to be presented.

Second, in terms of inclusion criteria, only patients with a clinically visible tumor were included in this study. However, the size of tumor can be measured with inspection, palpation, and colposcopic examination (although not specifically addressed). Examiner would be able to measure the tumor size by palpation; hence, it is inappropriate to exclude the patients with a clinically invisible tumor (for example, a tumor located in endocervical canal). The inappropriate exclusion of patients with a clinically invisible tumor accounted for the fact that there were no tumors that were undetected by pelvic examination. Considering that, as we mentioned previously, tumors were undetected by imaging modalities in 21 patients and they presumably accounted for poor correlation between imaging modalities and pathologic results, the inappropriate inclusion criteria could cause a selection bias. In addition, the inappropriate inclusion criteria made the result of this study difficult to apply to patients with an endocervical tumor.

Third, in the discussion section, the authors insisted that the accuracy of CT and MRI is overestimated by quoting the result of ACRIN 6651/GOG 183 Intergroup study.⁴ However, the authors did not mention another study which included the re-analysis of the result of ACRIN 6651/GOG 183 Intergroup study and directly addressed the same issue with the current study.⁴ In the study including 172 patients with cervical can-

cer, MRI is superior to CT and pelvic examination for measuring tumor size using pathologic results as the standard reference.⁴ The authors should have explained the discrepancies between the current study and ACRIN 6651/GOG 183 Intergroup study.

Finally, we recommend a measurement method of tumor size at the time of colposcopic examination. We use a commercially available 8mm-sized round white paper, which is easily attached on the cervix, and then take a picture after application of lugol solution. The actual size of lesion can be measured by comparing the sizes of the lesion and 8 mm-sized reference paper.

REFERENCES

1. Lee YK, Han SS, Kim JW, Park NH, Song YS, Kang SB. Value of pelvic examination and imaging modality for the evaluation of tumor size in cervical cancer. *J Gynecol Oncol* 2008; 19: 108-12.
2. Hricak H, Gatsonis C, Coakley FV, Snyder B, Reinhold C, Schwartz LH, et al. Early invasive cervical cancer: CT and MR imaging in preoperative evaluation - ACRIN/GOG comparative study of diagnostic performance and interobserver variability. *Radiology* 2007; 245: 491-8.
3. Hricak H, Gatsonis C, Chi DS, Amendola MA, Brandt K, Schwartz LH, et al. Role of imaging in pretreatment evaluation of early invasive cervical cancer: results of the intergroup study American College of Radiology Imaging Network 6651-Gynecologic Oncology Group 183. *J Clin Oncol* 2005; 23: 9329-37.
4. Mitchell DG, Snyder B, Coakley F, Reinhold C, Thomas G, Amendola M, et al. Early invasive cervical cancer: tumor delineation by magnetic resonance imaging, computed tomography, and clinical examination, verified by pathologic results, in the ACRIN 6651/GOG 183 Intergroup Study. *J Clin Oncol* 2006; 24: 5687-94.

Suck Chul Choi, Kidong Kim, Sang Il Park, Beob Jong Kim, Moon Hong Kim, Sang Young Ryu, Eui Don Lee, Kyung Hee Lee

Department of Obstetrics & Gynecology, Korea Cancer Center Hospital,
Korea Institute of Radiological & Medical Sciences, 139-240,
Gongneung-dong, Nowon-gu, Seoul, Korea

Address correspondence and reprint requests to: **Suck Chul Choi**

Department of Obstetrics & Gynecology, Korea Cancer Center Hospital, Korea Institute of Radiological & Medical Sciences, 139-240, Gongneung-dong, Nowon-gu, Seoul, Korea
Tel: 82-2-970-1226, Fax: 82-2-970-1227
E-mail: csc@kcch.re.kr

In reply: We appreciate Dr. Choi and colleagues' interest in our recent paper describing pelvic examination and imaging modality for the evaluation of tumor size in cervical cancer. These authors have raised interesting questions and made detailed clarifications of some issues regarding this controversial topic.

As the authors mentioned, CT and MR imaging might have different resolution. We agreed with their description, and

our draft also demonstrated this limitation. The accuracy of cervical mass measured only by MRI was superior to that measured by CT or MRI in previous study¹⁻⁴ as well as the reference which they described.⁵ In the subgroup analysis which we have performed after publication, MRI was more accurate than CT for the evaluation of cervical mass in 25 patients who underwent both CT and MRI, even though small number and even without statistically significance ($p=0.06$).

For the term, "clinically visible tumor", we do think that this expression leads the readers to confusion. We measured cervical mass not only by vision but by palpation as we mentioned in the section "protocol for diagnostic work up". And it is better to change the term to "clinically detectable tumor".

Dr. Choi et al. commented that the discrepancies between our paper and previous data, and we agreed that this study showed important data for us.⁶ However we do not think there was big discrepancy on the point of r_s , even we could not compare the values of two studies directly. Above all, we assented to the superiority of MRI to CT. We just intended to propose that the studies in 90's and early 2000's have overestimated the role of imaging tools than recent studies.

About the last comment, 8 mm-sized paper seems very attractive tools for measurement of mass. Although we commonly use scale in millimeter attached on an eye lens in colposcopy, the papers might be good alternatives in many cases.

REFERENCES

1. Hricak H, Gatsonis C, Chi DS, Amendola MA, Brandt K, Schwartz LH, et al. Role of imaging in pretreatment evaluation of early invasive cervical cancer: results of the intergroup study American College of Radiology Imaging Network 6651-Gynecologic Oncology Group 183. *J Clin Oncol* 2005; 23: 9329-37.
2. Kim SH, Choi BI, Han JK, Kim HD, Lee HP, Kang SB, et al. Preoperative staging of uterine cervical carcinoma: comparison of CT and MRI in 99 patients. *J Comput Assist Tomogr* 1993; 17: 633-40.
3. Sironi S, De Cobelli F, Scarfone G, Colombo E, Bolis G, Ferrari A, et al. Carcinoma of the cervix: value of plain and gadolinium-enhanced MR imaging in assessing degree of invasiveness. *Radiology* 1993; 188: 797-801.
4. Togashi K, Nishimura K, Sagoh T, Minami S, Noma S, Fujisawa I, et al. Carcinoma of the cervix: staging with MR imaging. *Radiology* 1989; 171: 245-51.
5. Hricak H, Gatsonis C, Coakley FV, Snyder B, Reinhold C, Schwartz LH, et al. Early invasive cervical cancer: CT and MR imaging in preoperative evaluation - ACRIN/GOG comparative study of diagnostic performance and interobserver variability. *Radiology* 2007; 245: 491-8.
6. Mitchell DG, Snyder B, Coakley F, Reinhold C, Thomas G, Amendola M, et al. Early invasive cervical cancer: tumor delineation by magnetic resonance imaging, computed tomography, and clinical examination, verified by pathologic results, in the ACRIN 6651/GOG 183 Intergroup Study. *J Clin Oncol* 2006; 24: 5687-94.

Yoo-Kyung Lee¹, Seung-Su Han², Jae Weon Kim¹, Noh-Hyun Park¹,
Yong-Sang Song¹, Soon-Beom Kang¹

¹Department of Obstetrics and Gynecology, College of Medicine, Seoul National University, ²Department of Obstetrics and Gynecology, College of Medicine, Chung-Ang University, Seoul, Korea

Address correspondence and reprint requests to: **Yoo-Kyung Lee**

Department of Obstetrics and Gynecology, Seoul National University College of Medicine, 28, Yeongeong-dong, Jongno-gu, Seoul 110-744, Korea

Tel: 82-2-2072-2821, Fax: 82-2-762-3599

E-mail: yookyung@snu.ac.kr